Generation Interconnection

Feasibility Study Report

for

Queue Project AG1-168

LONE PINE 115 KV

12 MW Capacity / 20 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 Dominion.

2 Preface

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

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

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

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 Solar generating facility located in Nottoway County, Virginia. The installed facilities will have a total capability of 20 MW with 12 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is October 15, 2021. This study does not imply a TO commitment to this in-service date.

Queue Number	AG1-168
Project Name	LONE PINE 115 KV
State	Virginia
County	Nottoway
Transmission Owner	Dominion
MFO	20
MWE	20
MWC	12
Fuel	Solar
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

4.1 Primary Point of Interconnection

AG1-168 "Lone Pine 115 kV" will interconnect with the Dominion transmission system sharing the POI and Attachment Facilities with AG1-166.

The IC is responsible for securing right-of-way, permits, and constructing the proposed attachment line from the generating facility site to the Point of Interconnection. The IC may not install any facilities on Dominion's right-of-way without first obtaining the necessary approval from Dominion Energy.

Costs provided are contingent on the AG1-166 project being built. Should the AG1-166 project withdraw from the Interconnection Queue, the AG1-168 project will assume the Attachment, Direct Connection, and Non-Direct Connection costs identified in the AG1-166 study report for connection to the Dominion system.

Attachment 1 shows a one-line diagram of the proposed interconnection facilities.

4.2 Secondary Point of Interconnection

There is no secondary point of interconnection specified for AG1-167.

5 Cost Summary

The AG1-168 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$0
Total System Network Upgrade Costs	$156,381,000[1]
Total Costs	$156,381,000

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 2016-36, 2016-25 I.R.B. (6/20/2016). 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.

[1] This project currently causes and/or contributes to overloads of the Transmission System (see Summer Peak Load Flow Analysis section below) and therefore has potential to have cost allocation for the system reinforcements listed in the report. This will be re-evaluated in the System Impact phase. The results may vary with queue customers withdrawing from the queue and other generators deactivating over time. If a customer is the first to cause the need for a project (causes loading to exceed 100% of rating), then the customer is responsible. If a customer contributes to a facility that is already overloaded by a prior queue, then they may receive cost allocation.

6 Transmission Owner Scope of Work

The required Attachment Facilities, Direct Connection and Non-Direct Connection work for the interconnection of AG1-168 to the Dominion Transmission System is detailed in the following sections. The associated one-line showing the generation project attachment facilities and primary direct and non-direct connection is shown in Attachment 1.

Note that the ITO findings were made from a conceptual review of this project. A more detailed review of the connection facilities and their cost will be identified in a future study phase. Further note that the cost estimate data contained in this document should be considered high level estimates since it was produced without a detailed engineering review. The applicant will be responsible for the actual cost of construction. ITO herein reserves the right to return to any issues in this document and, upon appropriate justification, request additional monies to complete any reinforcements to the transmission systems.

As AG1-168 is sharing the POI and Attachment Facilities with AG1-166, there are no associated interconnection costs for this project. Should the AG1-166 project withdraw from the Interconnection Queue,the AG1-168 project will assume the Attachment, Direct Connection, and Non-Direct Connection costs identified in the AG1-166 study report for connection to the Dominion system.

It is estimated to take 18-30 months to complete this work upon execution of an Interconnection Construction Service Agreement (ICSA). These preliminary cost estimates are based on typical engineering costs. A more detailed engineering cost estimates are normally done when the IC provides an exact site plan location for the generation substation during the Facility Study phase.

Remote Terminal Work: During the Facilities Study, ITO's System Protection Engineering Department will review transmission line protection as well as anti-islanding required to accommodate the new generation and interconnection substation. System Protection Engineering will determine the minimal acceptable protection requirements to reliably interconnect the proposed generating facility with the transmission system. The review is based on maintaining system reliability by reviewing ITO's protection requirements with the known transmission system configuration which includes generating facilities in the area. This review may determine that transmission line protection and communication upgrades are required at remote substations.

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

7 Schedule

The estimated schedule for the Attachment Facilities, Direct Connection and Non-Direct Connection work is identified in the "Transmission Owner Scope of Work" section of this report.

The estimated schedule for the required Network Impact Reinforcements is identified in the "System Reinforcements" section of this report.

These schedules will be more cleary identified in future study phases.

8 Transmission Owner Analysis

Dominion assessed the impact of the proposed project for compliance with NERC Reliability Criteria on the Dominion Transmission System. The system was assessed using the summer 2024 AG1 case provided to Dominion by PJM.

When performing a generation analysis, Dominion's main analysis includes load flow study results following a single contingency event for both normal and stressed system conditions. Dominion Criteria considers a transmission facility overloaded if it exceeds 94% of its emergency rating under normal and stressed system conditions. A full listing of Dominion's Planning Criteria and interconnection requirements can be found in the Company's Facility Connection Requirements which are publicly available at: http://www.dominionenergy.com.

The results of these studies evaluate the system under a limited set of operating conditions and do not guarantee the full delivery of the capacity and associated energy of this proposed generation facility under all operating conditions. NERC Planning and Operating Reliability Criteria allow for the re-dispatch of generating units to resolve projected and actual deficiencies in real time and planning studies. Specifically, in Planning Studies, NERC Planning Event 3 and 6 Contingency Conditions (Loss of generator, transmission circuit, transformer, shunt device, or Single Pole of a DC line followed by the loss of a generator, transmission circuit, transformer, shunt device or single pole of a DC line) allow for re-dispatch of generating units to resolve potential reliability deficiencies. For Dominion Planning Criteria the re-dispatch of generating units for these contingency conditions is allowed as long as the projected loading does not exceed 100% of a facility Load Dump Rating.

8.1 Power Flow Analysis

PJM performed a power flow analysis of the transmission system using a 2024 summer peak load flow model and the results were verified by Dominion. Additionally, Dominion performed an analysis of its transmission system and no further deficiencies were identified.

9 Interconnection Customer Requirements

9.1 System Protection

The IC must design its Customer Facilities in accordance with all applicable standards, including the standards in Dominion's "Dominion Energy Electric Transmission Generator Interconnection Requirements" documented in Dominion's Facility Interconnection Requirements "Exhibit C" located at: https://www.dominionenergy.com/company/moving-energy/electric-transmission-access. Preliminary Protection requirements will be provided as part of the Facilities Study. Detailed Protection Requirements will be provided once the project enters the construction phase.

9.2 Compliance Issues and Interconnection Customer Requirements

The proposed Customer Facilities must be designed in accordance with Dominion's "Dominion's Facility Interconnection Requirements" document located at: https://www.dominionenergy.com/company/moving-energy/electric-transmission-access. In particular, the IC is responsible for the following:

1. The purchase and installation of a fully rated protection device (circuit breaker, circuit switcher, fuse) to protect the IC's GSU transformer(s).
2. The purchase and installation of the minimum required Dominion generation interconnection relaying and control facilities as described in the System Protection section noted above. This includes over/under voltage protection, over/under frequency protection, and zero sequence voltage protection relays.
3. The purchase and installation of supervisory control and data acquisition ("SCADA") equipment to provide information in a compatible format to the Dominion Transmission System Control Center.
4. Compliance with the Dominion and PJM generator power factor and voltage control requirements.

The GSU(s) associated with the IC queue request shall meet the grounding requirements as noted in Dominion's "Dominion's Facility Interconnection Requirements" document located at: https://www.dominionenergy.com/company/moving-energy/electric-transmission-access.

The IC will also be required to meet all PJM, SERC, and NERC reliability criteria and operating procedures for standards compliance. For example, the IC will need to properly locate and report the over and under voltage and over and under frequency system protection elements for its units as well as the submission of the generator model and protection data required to satisfy the PJM and SERC audits. Failure to comply with these requirements may result in a disconnection of service if the violation is found to compromise the reliability of the Dominion system.

9.3 Power Factor Requirements

The IC shall design its non-synchronous Customer Facility with the ability to maintain a power factor of at least 0.95 leading (absorbing VARs) to 0.95 lagging (supplying VARs) measured at the high-side of the facility substation transformer(s) connected to the Dominion transmission system.

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:

- Back Panel temperature (Fahrenheit) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Irradiance (Watts/meter2) - (Required for plants with Maximum Facility Output of 3 MW or higher)
- Ambient air temperature (Fahrenheit) - (Accepted, not required)
- Wind speed (meters/second) - (Accepted, not required)
- Wind direction (decimal degrees from true north) - (Accepted, not required)

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/

11 Summer Peak - Load Flow Analysis

The Queue Project AG1-168 was evaluated as a 20.0 MW (Capacity 12.0 MW) injection at the Lone Pine 115 kV substation in the Dominion area. Project AG1-168 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AG1-168 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)

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
168380522	313868	6CARTERV	230.0	DVP	933500	AC2-165 TAP	230.0	DVP	1	DVP_P1-2: LN 2028-B	single	800.880004883	99.75	100.04	DC	2.3
168380523	313868	6CARTERV	230.0	DVP	933500	AC2-165 TAP	230.0	DVP	1	3147656MTEAGLE 230 966790 AG1-550 TAP 230 1	single	800.880004883	99.74	100.03	DC	2.3
169142324	314696	3SEDGE HILL	115.0	DVP	314697	6SEDGE HILL	230.0	DVP	2	DVP_P1-3: 6SEDGE HILL-TX#1	single	256.055999756	99.51	100.07	DC	1.41
168380348	936260	AD2-033 TAP	115.0	DVP	313898	3BUTCHER CRK	115.0	DVP	1	DVP_P1-2: LN 158	single	269.779998779	99.37	103.82	DC	12.0

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	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
168380297	313755	3FLAT CREEK	115.0	DVP	314707	3MORAN	115.0	DVP	1	DVP_P1-2: LN 1045	single	203.979995728	158.18	164.06	DC	12.0
168380314	313898	3BUTCHER CRK	115.0	DVP	314267	3CHASCTY2	115.0	DVP	1	DVP_P1-2: LN 158	single	269.779998779	119.6	124.05	DC	12.0
169142238	314691	3FARMVIL	115.0	DVP	314692	6FARMVIL	230.0	DVP	2	DVP_P1-2: LN 235-A	single	182.641998291	192.03	195.05	DC	5.52
169142240	314691	3FARMVIL	115.0	DVP	314692	6FARMVIL	230.0	DVP	2	DVP_P1-2: LN 1045	single	182.641998291	133.5	136.65	DC	5.76
169142241	314691	3FARMVIL	115.0	DVP	314692	6FARMVIL	230.0	DVP	2	Base Case	single	176.814010602	110.37	112.41	DC	3.6
169142249	314691	3FARMVIL	115.0	DVP	314692	6FARMVIL	230.0	DVP	1	DVP_P1-2: LN 298	single	198.057998657	117.25	119.75	DC	4.95
168380292	314701	3LONEPN	115.0	DVP	313755	3FLAT CREEK	115.0	DVP	1	DVP_P1-2: LN 1045	single	203.979995728	158.18	164.06	DC	12.0
163584443	314702	3KERR	115.0	DVP	304102	3GW KING TAP	115.0	CPLE	1	DVP_P4-6: CAROLIN T122	breaker	199.0	149.77	150.3	DC	2.39

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
163584444	314702	3KERR	115.0	DVP	304102	3GW KING TAP	115.0	CPLE	1	DVP_P4-2: 13002	breaker	199.0	128.44	128.91	DC	2.09
163584445	314702	3KERR	115.0	DVP	304102	3GW KING TAP	115.0	CPLE	1	DVP_P4-2: 102802	breaker	199.0	128.44	128.91	DC	2.09
163585318	314702	3KERR	115.0	DVP	304102	3GW KING TAP	115.0	CPLE	1	DVP_P7-1: LN 22-90	tower	199.0	147.06	147.59	DC	2.36
169142276	314707	3MORAN	115.0	DVP	314691	3FARMVIL	115.0	DVP	1	DVP_P1-2: LN 1045	single	203.979995728	154.8	160.68	DC	12.0

11.4 Potential Congestion due to Local Energy Deliverability

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

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

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
168380294	313755	3FLAT CREEK	115.0	DVP	314707	3MORAN	115.0	DVP	1	DVP_P1-2: LN 1045	operation	203.979995728	277.21	287.01	DC	19.99
168380296	313755	3FLAT CREEK	115.0	DVP	314707	3MORAN	115.0	DVP	1	Base Case	operation	203.979995728	144.78	150.21	DC	11.07
168380311	313898	3BUTCHER CRK	115.0	DVP	314267	3CHASCTY2	115.0	DVP	1	DVP_P1-2: LN 158	operation	269.779998779	209.6	217.01	DC	19.99
168380313	313898	3BUTCHER CRK	115.0	DVP	314267	3CHASCTY2	115.0	DVP	1	Base Case	operation	247.220001221	143.98	147.58	DC	8.92
168682805	314267	3CHASCTY2	115.0	DVP	314681	3CHASCTY	115.0	DVP	Z1	DVP_P1-2: LN 158	operation	449.320007324	102.93	105.54	DC	11.71
168682595	314427	3LUNENBURG	115.0	DVP	936260	AD2-033 TAP	115.0	DVP	1	DVP_P1-2: LN 158	operation	269.779998779	131.68	139.09	DC	20.0
169142278	314677	6BUCKING	230.0	DVP	314747	6BREMO	230.0	DVP	1	DVP_P1-2: LN 556-C	operation	571.520019531	234.31	235.71	DC	7.98
169142282	314677	6BUCKING	230.0	DVP	314747	6BREMO	230.0	DVP	1	Base Case	operation	571.520019531	137.35	138.53	DC	6.74
169142236	314691	3FARMVIL	115.0	DVP	314692	6FARMVIL	230.0	DVP	2	DVP_P1-2: LN 235-A	operation	182.641998291	299.46	304.49	DC	9.2
169142239	314691	3FARMVIL	115.0	DVP	314692	6FARMVIL	230.0	DVP	2	Base Case	operation	176.81401062	184.08	187.48	DC	6.01
169142247	314691	3FARMVIL	115.0	DVP	314692	6FARMVIL	230.0	DVP	1	DVP_P1-2: LN 298	operation	198.057998657	211.99	216.15	DC	8.25

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
169142250	314691	3FARMVIL	115.0	DVP	314692	6FARMVIL	230.0	DVP	1	Base Case	operation	193.734008789	135.29	137.79	DC	4.84
169142257	314692	6FARMVIL	230.0	DVP	314677	6BUCKING	230.0	DVP	1	DVP_P1-2: LN 556-C	operation	559.299987793	237.09	238.52	DC	7.99
169142261	314692	6FARMVIL	230.0	DVP	314677	6BUCKING	230.0	DVP	1	Base Case	operation	559.299987793	135.61	136.82	DC	6.74
169142306	314696	3SEDGE HILL	115.0	DVP	314697	6SEDGE HILL	230.0	DVP	1	DVP_P1-3: 6SEDGE HILL-TX#2	operation	226.727996826	182.14	182.61	DC	2.36
168380289	314701	3LONEPN	115.0	DVP	313755	3FLAT CREEK	115.0	DVP	1	DVP_P1-2: LN 1045	operation	203.979995728	277.21	287.01	DC	19.99
168380291	314701	3LONEPN	115.0	DVP	313755	3FLAT CREEK	115.0	DVP	1	Base Case	operation	203.979995728	144.78	150.21	DC	11.07
169142273	314707	3MORAN	115.0	DVP	314691	3FARMVIL	115.0	DVP	1	DVP_P1-2: LN 1045	operation	203.979995728	273.83	283.63	DC	19.99
169142275	314707	3MORAN	115.0	DVP	314691	3FARMVIL	115.0	DVP	1	Base Case	operation	203.979995728	141.35	146.78	DC	11.07
168682726	314723	3VICTRIA	115.0	DVP	314427	3LUNENBURG	115.0	DVP	1	DVP_P1-2: LN 158	operation	326.179992676	112.46	118.59	DC	20.0
169142403	314725	3VICT DP	115.0	DVP	314723	3VICTRIA	115.0	DVP	1	DVP_P1-2: LN 158	operation	269.779998779	137.75	145.17	DC	20.0
168380345	936260	AD2-033 TAP	115.0	DVP	313898	3BUTCHER CRK	115.0	DVP	1	DVP_P1-2: LN 158	operation	269.779998779	179.82	187.23	DC	20.0
168380347	936260	AD2-033 TAP	115.0	DVP	313898	3BUTCHER CRK	115.0	DVP	1	Base Case	operation	247.220001221	113.79	117.4	DC	8.92
169142398	961890	AG1-030 TAP	115.0	DVP	314725	3VICT DP	115.0	DVP	1	DVP_P1-2: LN 158	operation	269.779998779	139.01	146.43	DC	20.0
169142379	962490	AG1-098 TAP	230.0	DVP	314686	6CLOVER	230.0	DVP	1	DVP_P1-2: LN 298	operation	571.520019531	106.01	107.45	DC	8.25

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
169142249	7	3FARMVIL 115.0 kV - 6FARMVIL 230.0 kV Ckt 1	**DVP** dom-089 (1274) : Add additional 230/115 kV transformer at Farmville substation Project Type : CON Cost : $6,000,000 Time Estimate : 16-18 Months	$6,000,000
169142324	2	3SEDGE HILL 115.0 kV - 6SEDGE HILL 230.0 kV Ckt 2	**DVP** dom-046 (1224) : Add additional 230/115 kV transformer at Sedge Hill substation. Project Type : CON Cost : $6,000,000 Time Estimate : 16-18 Months	$6,000,000
169142276	10	3MORAN 115.0 kV - 3FARMVIL 115.0 kV Ckt 1	**DVP** dom-271 (1497) : Rebuild 70 miles of 115 kV lines (158, 84, 154, 1012) from Chase City to Lone Pine with 2-636 ACSR 150 C. Line 84: - Willis Mountain terminal: Replace Line Switch - Farmville terminal: Replace Breaker Switch, Breaker Lead, Line Lead, Wave Trap - Pamplin terminal: Replace Wave Trap, Line Lead and Relay (Secondary CT) Line 154: - Twittys Creek terminal: Replace Wave Trap and Line Lead - Madisonville terminal: Replace Line Switch - Pamplin terminal: Replace Wave Trap and Line Lead Line 158: - Farmville terminal: Replace Breaker Switch, Breaker Lead - Moran DP terminal: Replace Line Switch - Lone Pine terminal: Replace Wave Trap Line 1012: - Chase City terminal: Replace Breaker, Breaker switch, Breaker Lead and Wave Trap - Central terminal: Replace Line Switch - Twitty's Creek terminal: Replace Wave Trap Project Type : FAC Cost : $109,470,000 Time Estimate : 60-72 Months	$109,470,000
163584444,163584445,163584443,163585318	9	3KERR 115.0 kV - 3GW KING TAP 115.0 kV Ckt 1	**DVP** n6115 (1171) : For DEV portion, rebuild 4.7 miles of 115 kV Line 45 from Kerr Dam to GW King Tap with 768 ACSS. Project Type : FAC Cost : $6,123,000 Time Estimate : 30-36 Months	$6,123,000
169142240,169142241,169142238	6	3FARMVIL 115.0 kV - 6FARMVIL 230.0 kV Ckt 2	**DVP** dom-089 (1274) : Add additional 230/115 kV transformer at Farmville substation Project Type : CON Cost : $6,000,000 Time Estimate : 16-18 Months	$6,000,000

ID	Idx	Facility	Upgrade Description	Cost
168380522,168380523	1	6CARTERV 230.0 kV - AC2-165 TAP 230.0 kV Ckt 1	**DVP** **dom-277 (1503) : Rebuild 7.67 miles of 230 kV Line 2027 from Carterville to AC2-165 Tap with 2-636 ACSR (24/7) 150 C** **Project Type : FAC** **Cost : $19,175,000** **Time Estimate : 36-40 Months**	$19,175,000
168380292	8	3LONEPN 115.0 kV - 3FLAT CREEK 115.0 kV Ckt 1	**DVP** **dom-271 (1497) : Rebuild 70 miles of 115 kV lines (158, 84, 154, 1012) from Chase City to Lone Pine with 2-636 ACSR 150 C.** **Line 84:** **- Willis Mountain terminal: Replace Line Switch** **- Farmville terminal: Replace Breaker Switch, Breaker Lead, Line Lead, Wave Trap** **- Pamplin terminal: Replace Wave Trap, Line Lead and Relay (Secondary CT)** **Line 154:** **- Twittys Creek terminal: Replace Wave Trap and Line Lead** **- Madisonville terminal: Replace Line Switch** **- Pamplin terminal: Replace Wave Trap and Line Lead** **Line 158:** **- Farmville terminal: Replace Breaker Switch, Breaker Lead** **- Moran DP terminal: Replace Line Switch** **- Lone Pine terminal: Replace Wave Trap** **Line 1012:** **- Chase City terminal: Replace Breaker, Breaker switch, Breaker Lead and Wave Trap** **- Central terminal: Replace Line Switch** **- Twitty's Creek terminal: Replace Wave Trap** **Project Type : FAC** **Cost : $109,470,000** **Time Estimate : 60-72 Months**	$109,470,000
168380314	5	3BUTCHER CRK 115.0 kV - 3CHASCTY2 115.0 kV Ckt 1	**DVP** **dom-279 (1505) : Rebuild 1.17 miles of 115 kV line 1045 from Butcher Creek to Chase City with 2-636 ACSR 150 C. Replace Breaker Switch at Chase City terminal** **Project Type : FAC** **Cost : $2,005,000** **Time Estimate : 30-36 Months**	$2,005,000
168380348	3	AD2-033 TAP 115.0 kV - 3BUTCHER CRK 115.0 kV Ckt 1	**DVP** **dom-393 (1619) : Reconductor 12.68 miles of 115 kV Line 98 from AD2-033 Tap to Butcher Creek with 768.2 ACSS 250 C.** **Project Type : FAC** **Cost : $7,608,000** **Time Estimate : 36-40 Months**	$7,608,000

ID	Idx	Facility	Upgrade Description	Cost
168380297	4	3FLAT CREEK 115.0 kV - 3MORAN 115.0 kV Ckt 1	**DVP** **dom-271 (1497) : Rebuild 70 miles of 115 kV lines (158, 84, 154, 1012) from Chase City to Lone Pine with 2-636 ACSR 150 C.** **Line 84:** **- Willis Mountain terminal: Replace Line Switch** **- Farmville terminal: Replace Breaker Switch, Breaker Lead, Line Lead, Wave Trap** **- Pamplin terminal: Replace Wave Trap, Line Lead and Relay (Secondary CT)** **Line 154:** **- Twittys Creek terminal: Replace Wave Trap and Line Lead** **- Madisonville terminal: Replace Line Switch** **- Pamplin terminal: Replace Wave Trap and Line Lead** **Line 158:** **- Farmville terminal: Replace Breaker Switch, Breaker Lead** **- Moran DP terminal: Replace Line Switch** **- Lone Pine terminal: Replace Wave Trap** **Line 1012:** **- Chase City terminal: Replace Breaker, Breaker switch, Breaker Lead and Wave Trap** **- Central terminal: Replace Line Switch** **- Twitty's Creek terminal: Replace Wave Trap** **Project Type : FAC** **Cost : $109,470,000** **Time Estimate : 60-72 Months**	$109,470,000
			TOTAL COST	**$156,381,000**

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
168380523	313868	6CARTERV	DVP	933500	AC2-165 TAP	DVP	1	314765 6MTEAGLE 230 966790 AG1-550 TAP 230 1	single	800.88	99.74	100.03	DC	2.3

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313527	AB2-043 C	0.2811	80/20	0.2811
314429	3JTRSVLE	0.4835	80/20	0.4835
314677	6BUCKING	0.8051	80/20	0.8051
315153	1CLOVER1	4.3284	80/20	4.3284
315154	1CLOVER2	4.2852	80/20	4.2852
315158	1KERR 1	0.1411	80/20	0.1411
315159	1KERR 2	0.3952	80/20	0.3952
315160	1KERR 3	0.3952	80/20	0.3952
315161	1KERR 4	0.3952	80/20	0.3952
315162	1KERR 5	0.3952	80/20	0.3952
315163	1KERR 6	0.3952	80/20	0.3952
315164	1KERR 7	0.3952	80/20	0.3952
315191	1BEARGRDN G1	14.2615	80/20	14.2615
315192	1BEARGRDN G2	14.2615	80/20	14.2615
315193	1BEARGRDN S1	18.4429	80/20	18.4429
315266	1PLYWOOD A	0.4253	80/20	0.4253
316118	AC1-105 C	2.1876	80/20	2.1876
316131	AB2-060 C	0.8407	80/20	0.8407
924301	**AB2-077 C O1 (Suspended)**	**1.0994**	**80/20**	**1.0994**
924311	**AB2-078 C O1 (Suspended)**	**1.0994**	**80/20**	**1.0994**
924321	**AB2-079 C O1 (Suspended)**	**1.0994**	**80/20**	**1.0994**
925611	AC1-036 C	0.1990	80/20	0.1990
927261	AC1-222 C	1.2313	80/20	1.2313
932511	AC2-071 C	0.7932	80/20	0.7932
934311	AD1-055 C	0.8549	80/20	0.8549
934615	AD1-087 C	2.7103	80/20	2.7103
934625	AD1-088 C	10.6986	80/20	10.6986
935171	AD1-152 C O1	2.9770	80/20	2.9770
935221	AD1-157 C	0.2946	80/20	0.2946
936265	AD2-033 C	10.6548	80/20	10.6548
936361	AD2-046 C O1	3.5828	80/20	3.5828
936485	AD2-063 C	10.3014	80/20	10.3014
937481	AD2-202 C O1	0.7939	80/20	0.7939
938371	AE1-056 C	8.0514	80/20	8.0514
938821	AE1-108 C O1	29.3769	80/20	29.3769
939181	AE1-148 C	3.5932	80/20	3.5932
940661	AE2-053 O1	1.3308	80/20	1.3308

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
941011	AE2-092 C	25.2830	80/20	25.2830
941791	AE2-182 C	1.7381	80/20	1.7381
942451	AE2-258	1.3292	80/20	1.3292
942461	AE2-259 C O1	15.0522	80/20	15.0522
943901	AF1-058 C	0.6646	80/20	0.6646
943911	AF1-059	5.9093	80/20	5.9093
946291	AF1-293 C O1	39.5443	80/20	39.5443
946301	AF1-294 C	4.8845	80/20	4.8845
946591	AF1-323 C	9.4261	80/20	9.4261
958131	AF2-107 C	4.3750	80/20	4.3750
958211	AF2-115 C	2.8733	80/20	2.8733
958801	AF2-171 C	17.1603	80/20	17.1603
959311	AF2-222 C	15.3100	80/20	15.3100
959751	AF2-266	3.1070	80/20	3.1070
960061	AF2-297 C	2.6582	80/20	2.6582
960111	AF2-302 C	3.4277	80/20	3.4277
961061	AF2-397 C	36.6545	80/20	36.6545
961791	AG1-021 C	2.2986	80/20	2.2986
961801	AG1-022 C	3.4277	80/20	3.4277
961891	AG1-030 C	15.8319	80/20	15.8319
962041	AG1-048 C	14.3663	80/20	14.3663
962441	AG1-093 C O1	5.8337	80/20	5.8337
962491	AG1-098 C O1	8.1622	80/20	8.1622
962561	AG1-105 C O1	3.5664	80/20	3.5664
962741	AG1-123 C O1	3.1842	80/20	3.1842
962751	AG1-124 C O1	3.5741	80/20	3.5741
963171	AG1-166 C	2.2986	80/20	2.2986
963181	AG1-167 C	2.2986	80/20	2.2986
963191	AG1-168 C	2.2986	80/20	2.2986
963201	AG1-169 C	2.2986	80/20	2.2986
963211	AG1-170 C	2.2986	80/20	2.2986
963271	AG1-176 C O1	14.5637	80/20	14.5637
963321	AG1-181 C O1	14.0576	80/20	14.0576
963361	AG1-185 O1	6.8014	80/20	6.8014
963641	AG1-215 C	1.0727	80/20	1.0727
964111	AG1-272 C	2.2621	80/20	2.2621
964121	AG1-273 C	2.2621	80/20	2.2621
964131	AG1-274 C	2.2621	80/20	2.2621
964231	AG1-284 C O1	17.0012	80/20	17.0012
964241	AG1-285 C O1	8.1450	80/20	8.1450
964261	AG1-287 C	0.4984	80/20	0.4984
964471	AG1-310 C	0.7118	80/20	0.7118
964791	AG1-342 C	1.8023	80/20	1.8023
964821	AG1-345 C	0.9169	80/20	0.9169
964841	AG1-347 C	9.1358	80/20	9.1358
965191	AG1-384 C	2.2621	80/20	2.2621
965281	AG1-393 C	2.2986	80/20	2.2986
965451	AG1-413 C O1	2.4841	80/20	2.4841
965581	AG1-426	6.4002	80/20	6.4002
965591	AG1-427 C	7.7911	80/20	7.7911
965641	AG1-432 C O1	30.1044	80/20	30.1044
965721	AG1-440 C	2.3620	80/20	2.3620

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
965731	AG1-441 C	2.3620	80/20	2.3620
965771	AG1-445	1.3647	80/20	1.3647
965781	AG1-446	1.3647	80/20	1.3647
965831	AG1-451	5.0174	80/20	5.0174
966251	AG1-494 C	1.6494	80/20	1.6494
966791	AG1-550 O1	16.4475	80/20	16.4475
966861	**AG1-557 C O1 (Withdrawn : 12/14/2020)**	**3.0104**	**80/20**	**3.0104**
WEC	WEC	0.1988	Confirmed LTF	0.1988
LGEE	LGEE	0.4247	Confirmed LTF	0.4247
CPLE	CPLE	1.0859	Confirmed LTF	1.0859
CBM-W2	CBM-W2	7.3114	Confirmed LTF	7.3114
NY	NY	0.3512	Confirmed LTF	0.3512
TVA	TVA	1.3104	Confirmed LTF	1.3104
SIGE	SIGE	0.1503	Confirmed LTF	0.1503
CBM-S2	CBM-S2	14.4907	Confirmed LTF	14.4907
CBM-S1	CBM-S1	0.3374	Confirmed LTF	0.3374
MEC	MEC	1.1075	Confirmed LTF	1.1075
LAGN	LAGN	1.5942	Confirmed LTF	1.5942
CBM-W1	CBM-W1	8.3419	Confirmed LTF	8.3419

11.6.2 Index 2

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
169142324	314696	3SEDGE HILL	DVP	314697	6SEDGE HILL	DVP	2	DVP_P1-3: 6SEDGE HILL-TX#1	single	256.06	99.51	100.07	DC	1.41

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
246843	05SMG1	0.5788	80/20	0.5788
246844	05SMG2	1.5733	80/20	1.5733
246845	05SMG3	0.9864	80/20	0.9864
246846	05SMG4	1.5489	80/20	1.5489
246847	05SMG5	0.6032	80/20	0.6032
247284	05LEESVG	0.7274	80/20	0.7274
313527	AB2-043 C	0.6441	80/20	0.6441
314429	3JTRSVLE	0.2972	80/20	0.2972
314704	3LAWRENC	0.1691	80/20	0.1691
315156	1HALLBR1	1.3508	80/20	1.3508
315158	1KERR 1	0.3688	80/20	0.3688
315159	1KERR 2	1.0326	80/20	1.0326
315160	1KERR 3	1.0326	80/20	1.0326
315161	1KERR 4	1.0326	80/20	1.0326
315162	1KERR 5	1.0326	80/20	1.0326
315163	1KERR 6	1.0326	80/20	1.0326
315164	1KERR 7	1.0326	80/20	1.0326
315266	1PLYWOOD A	3.5951	80/20	3.5951
316118	AC1-105 C	17.1420	80/20	17.1420
316123	AC1-075 C	2.2897	80/20	2.2897
316129	AC1-054 C	4.6689	80/20	4.6689
316131	AB2-060 C	1.8231	80/20	1.8231
924301	**AB2-077 C O1 (Suspended)**	**2.6719**	**80/20**	**2.6719**
924311	**AB2-078 C O1 (Suspended)**	**2.6719**	**80/20**	**2.6719**
924321	**AB2-079 C O1 (Suspended)**	**2.6719**	**80/20**	**2.6719**
925611	AC1-036 C	0.2212	80/20	0.2212
925661	AC1-042 C	2.1663	80/20	2.1663
926023	AC1-080 C	0.7652	80/20	0.7652
926645	AC1-145 C	0.4069	80/20	0.4069
927261	AC1-222 C	12.0926	80/20	12.0926
934311	AD1-055 C	8.3962	80/20	8.3962
935221	AD1-157 C	0.1442	80/20	0.1442
936265	AD2-033 C	13.5182	80/20	13.5182
936361	AD2-046 C O1	9.0864	80/20	9.0864
936485	AD2-063 C	17.6022	80/20	17.6022
938371	AE1-056 C	3.9394	80/20	3.9394
939181	AE1-148 C	9.0639	80/20	9.0639

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939941	AE1-230 C	0.9773	80/20	0.9773
940661	AE2-053 O1	3.3570	80/20	3.3570
941801	AE2-185 C	4.8863	80/20	4.8863
941821	AE2-187 C	4.8863	80/20	4.8863
942451	AE2-258	3.0456	80/20	3.0456
942461	AE2-259 C O1	3.4614	80/20	3.4614
942671	AE2-283 C	5.3749	80/20	5.3749
942751	AE2-291 C	19.2303	80/20	19.2303
942761	AE2-292 C O1	23.9436	80/20	23.9436
943901	AF1-058 C	6.8382	80/20	6.8382
943911	AF1-059	13.9753	80/20	13.9753
945081	AF1-173	1.8934	80/20	1.8934
946301	AF1-294 C	3.0019	80/20	3.0019
958211	AF2-115 C	1.7658	80/20	1.7658
958801	AF2-171 C	10.6686	80/20	10.6686
959311	AF2-222 C	15.6530	80/20	15.6530
960061	AF2-297 C	27.3528	80/20	27.3528
961121	AF2-403	1.0858	80/20	1.0858
961791	AG1-021 C	1.4126	80/20	1.4126
961891	AG1-030 C	12.0195	80/20	12.0195
962041	AG1-048 C	8.8290	80/20	8.8290
962441	AG1-093 C O1	45.7120	80/20	45.7120
963171	AG1-166 C	1.4126	80/20	1.4126
963181	AG1-167 C	1.4126	80/20	1.4126
963191	AG1-168 C	1.4126	80/20	1.4126
963201	AG1-169 C	1.4126	80/20	1.4126
963211	AG1-170 C	1.4126	80/20	1.4126
963301	AG1-179 C	3.7578	80/20	3.7578
963311	AG1-180	1.8309	80/20	1.8309
963321	AG1-181 C O1	17.2581	80/20	17.2581
963361	AG1-185 O1	8.3499	80/20	8.3499
963601	AG1-209 C	0.3800	80/20	0.3800
963641	AG1-215 C	0.6592	80/20	0.6592
964111	AG1-272 C	2.5135	80/20	2.5135
964121	AG1-273 C	2.5135	80/20	2.5135
964131	AG1-274 C	2.5135	80/20	2.5135
964141	AG1-275 C	1.6288	80/20	1.6288
964151	AG1-276 C	1.6288	80/20	1.6288
964241	AG1-285 C O1	15.1132	80/20	15.1132
964251	AG1-286 C	0.6204	80/20	0.6204
964261	AG1-287 C	5.1287	80/20	5.1287
964471	AG1-310 C	6.8479	80/20	6.8479
964791	AG1-342 C	10.6614	80/20	10.6614
964821	AG1-345 C	0.5676	80/20	0.5676
965191	AG1-384 C	2.5135	80/20	2.5135
965281	AG1-393 C	1.4126	80/20	1.4126
965451	AG1-413 C O1	5.8747	80/20	5.8747
965591	AG1-427 C	14.2570	80/20	14.2570
965601	AG1-428 C O1	3.1371	80/20	3.1371
965641	AG1-432 C O1	6.9228	80/20	6.9228
965721	AG1-440 C	6.1749	80/20	6.1749
965731	AG1-441 C	6.1749	80/20	6.1749

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
965771	AG1-445	3.5677	80/20	3.5677
965781	AG1-446	3.5677	80/20	3.5677
965831	AG1-451	1.1538	80/20	1.1538
966691	AG1-539 C	10.0550	80/20	10.0550
966751	AG1-546 C	9.5834	80/20	9.5834
966761	AG1-547 C	4.4167	80/20	4.4167
966861	**AG1-557 C O1 (Withdrawn : 12/14/2020)**	**0.6923**	**80/20**	**0.6923**
WEC	WEC	0.0161	Confirmed LTF	0.0161
LGEE	LGEE	0.0503	Confirmed LTF	0.0503
CALDERWOOD	CALDERWOOD	0.1387	Confirmed LTF	0.1387
NY	NY	0.0553	Confirmed LTF	0.0553
PRAIRIE	PRAIRIE	0.0827	Confirmed LTF	0.0827
SIGE	SIGE	0.0180	Confirmed LTF	0.0180
CHEOAH	CHEOAH	0.1496	Confirmed LTF	0.1496
COTTONWOOD	COTTONWOOD	0.4284	Confirmed LTF	0.4284
HAMLET	HAMLET	0.6791	Confirmed LTF	0.6791
CATAWBA	CATAWBA	0.3035	Confirmed LTF	0.3035
CBM-W1	CBM-W1	0.7150	Confirmed LTF	0.7150

11.6.3 Index 3

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
168380348	936260	AD2-033 TAP	DVP	313898	3BUTCHER CRK	DVP	1	DVP_P1-2: LN 158	single	269.78	99.37	103.82	DC	12.0

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314429	3JTRSVLE	2.5241	80/20	2.5241
936265	AD2-033 C	77.9938	80/20	77.9938
946301	AF1-294 C	25.4980	80/20	25.4980
958211	AF2-115 C	14.9988	80/20	14.9988
961791	AG1-021 C	11.9990	80/20	11.9990
961891	AG1-030 C	89.9928	80/20	89.9928
962041	AG1-048 C	74.9940	80/20	74.9940
963171	AG1-166 C	11.9990	80/20	11.9990
963181	AG1-167 C	11.9990	80/20	11.9990
963191	AG1-168 C	11.9990	80/20	11.9990
963201	AG1-169 C	11.9990	80/20	11.9990
963211	AG1-170 C	11.9990	80/20	11.9990
963641	AG1-215 C	5.5996	80/20	5.5996
964821	AG1-345 C	4.7996	80/20	4.7996
965281	AG1-393 C	11.9990	80/20	11.9990
CALDERWOOD	CALDERWOOD	0.0040	Confirmed LTF	0.0040
NY	NY	0.0044	Confirmed LTF	0.0044
PRAIRIE	PRAIRIE	0.0207	Confirmed LTF	0.0207
CHEOAH	CHEOAH	0.0040	Confirmed LTF	0.0040
COTTONWOOD	COTTONWOOD	0.0168	Confirmed LTF	0.0168
HAMLET	HAMLET	0.0046	Confirmed LTF	0.0046
GIBSON	GIBSON	0.0044	Confirmed LTF	0.0044
BLUEG	BLUEG	0.0139	Confirmed LTF	0.0139
TRIMBLE	TRIMBLE	0.0045	Confirmed LTF	0.0045
CATAWBA	CATAWBA	0.0028	Confirmed LTF	0.0028

11.6.4 Index 4

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
168380297	313755	3FLAT CREEK	DVP	314707	3MORAN	DVP	1	DVP_P1-2: LN 1045	single	203.98	158.18	164.06	DC	12.0

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314429	3JTRSVLE	2.5234	80/20	2.5234
316131	AB2-060 C	8.5795	80/20	8.5795
936265	AD2-033 C	77.9711	80/20	77.9711
946301	AF1-294 C	25.4906	80/20	25.4906
958211	AF2-115 C	14.9945	80/20	14.9945
961791	AG1-021 C	11.9956	80/20	11.9956
961891	AG1-030 C	89.9667	80/20	89.9667
962041	AG1-048 C	74.9722	80/20	74.9722
963171	AG1-166 C	11.9956	80/20	11.9956
963181	AG1-167 C	11.9956	80/20	11.9956
963191	AG1-168 C	11.9956	80/20	11.9956
963201	AG1-169 C	11.9956	80/20	11.9956
963211	AG1-170 C	11.9956	80/20	11.9956
963641	AG1-215 C	5.5979	80/20	5.5979
964821	AG1-345 C	4.7982	80/20	4.7982
965281	AG1-393 C	11.9956	80/20	11.9956
CALDERWOOD	CALDERWOOD	0.0184	Confirmed LTF	0.0184
NY	NY	0.0205	Confirmed LTF	0.0205
PRAIRIE	PRAIRIE	0.0956	Confirmed LTF	0.0956
CHEOAH	CHEOAH	0.0185	Confirmed LTF	0.0185
COTTONWOOD	COTTONWOOD	0.0777	Confirmed LTF	0.0777
HAMLET	HAMLET	0.0214	Confirmed LTF	0.0214
GIBSON	GIBSON	0.0202	Confirmed LTF	0.0202
BLUEG	BLUEG	0.0642	Confirmed LTF	0.0642
TRIMBLE	TRIMBLE	0.0206	Confirmed LTF	0.0206
CATAWBA	CATAWBA	0.0129	Confirmed LTF	0.0129

11.6.5 Index 5

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
168380314	313898	3BUTCHER CRK	DVP	314267	3CHASCTY2	DVP	1	DVP_P1-2: LN 158	single	269.78	119.6	124.05	DC	12.0

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314429	3JTRSVLE	2.5234	80/20	2.5234
316131	AB2-060 C	8.5795	80/20	8.5795
936265	AD2-033 C	77.9711	80/20	77.9711
946301	AF1-294 C	25.4906	80/20	25.4906
958211	AF2-115 C	14.9945	80/20	14.9945
961791	AG1-021 C	11.9956	80/20	11.9956
961891	AG1-030 C	89.9667	80/20	89.9667
962041	AG1-048 C	74.9722	80/20	74.9722
963171	AG1-166 C	11.9956	80/20	11.9956
963181	AG1-167 C	11.9956	80/20	11.9956
963191	AG1-168 C	11.9956	80/20	11.9956
963201	AG1-169 C	11.9956	80/20	11.9956
963211	AG1-170 C	11.9956	80/20	11.9956
963641	AG1-215 C	5.5979	80/20	5.5979
964821	AG1-345 C	4.7982	80/20	4.7982
965281	AG1-393 C	11.9956	80/20	11.9956
CALDERWOOD	CALDERWOOD	0.0184	Confirmed LTF	0.0184
NY	NY	0.0205	Confirmed LTF	0.0205
PRAIRIE	PRAIRIE	0.0956	Confirmed LTF	0.0956
CHEOAH	CHEOAH	0.0185	Confirmed LTF	0.0185
COTTONWOOD	COTTONWOOD	0.0777	Confirmed LTF	0.0777
HAMLET	HAMLET	0.0214	Confirmed LTF	0.0214
GIBSON	GIBSON	0.0202	Confirmed LTF	0.0202
BLUEG	BLUEG	0.0642	Confirmed LTF	0.0642
TRIMBLE	TRIMBLE	0.0206	Confirmed LTF	0.0206
CATAWBA	CATAWBA	0.0129	Confirmed LTF	0.0129

11.6.6 Index 6

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
169142238	314691	3FARMVIL	DVP	314692	6FARMVIL	DVP	2	DVP_P1-2: LN 235-A	single	182.64	192.03	195.05	DC	5.52

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313506	AB1-173 C OP	2.1970	80/20	2.1970
313527	AB2-043 C	0.6200	80/20	0.6200
314429	3JTRSVLE	1.1615	80/20	1.1615
314572	3EMPORIA	0.1428	80/20	0.1428
314704	3LAWRENC	0.1773	80/20	0.1773
315158	1KERR 1	0.3023	80/20	0.3023
315159	1KERR 2	0.8464	80/20	0.8464
315160	1KERR 3	0.8464	80/20	0.8464
315161	1KERR 4	0.8464	80/20	0.8464
315162	1KERR 5	0.8464	80/20	0.8464
315163	1KERR 6	0.8464	80/20	0.8464
315164	1KERR 7	0.8464	80/20	0.8464
315266	1PLYWOOD A	0.5826	80/20	0.5826
316087	AB2-174 C	0.3670	80/20	0.3670
316118	AC1-105 C	3.1833	80/20	3.1833
316129	AC1-054 C	4.1416	80/20	4.1416
316131	AB2-060 C	1.8663	80/20	1.8663
923991	AB2-040 C O1	2.3927	80/20	2.3927
924301	**AB2-077 C O1 (Suspended)**	**2.4036**	**80/20**	**2.4036**
924311	**AB2-078 C O1 (Suspended)**	**2.4036**	**80/20**	**2.4036**
924321	**AB2-079 C O1 (Suspended)**	**2.4036**	**80/20**	**2.4036**
925611	AC1-036 C	0.4665	80/20	0.4665
927261	AC1-222 C	1.3197	80/20	1.3197
934311	AD1-055 C	0.9163	80/20	0.9163
935221	AD1-157 C	0.7121	80/20	0.7121
936265	AD2-033 C	24.7775	80/20	24.7775
936361	AD2-046 C O1	7.7284	80/20	7.7284
936485	AD2-063 C	23.4252	80/20	23.4252
938371	AE1-056 C	19.4582	80/20	19.4582
939181	AE1-148 C	7.7609	80/20	7.7609
940661	AE2-053 O1	2.8744	80/20	2.8744
942451	AE2-258	2.9317	80/20	2.9317
942461	AE2-259 C O1	36.8346	80/20	36.8346
943901	AF1-058 C	0.7463	80/20	0.7463
943911	AF1-059	13.9793	80/20	13.9793
946281	AF1-292 C	0.5181	80/20	0.5181
946301	AF1-294 C	11.7333	80/20	11.7333
958211	AF2-115 C	6.9020	80/20	6.9020
958801	AF2-171 C	41.2074	80/20	41.2074

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
959311	AF2-222 C	36.0450	80/20	36.0450
960061	AF2-297 C	2.9851	80/20	2.9851
960081	AF2-299 C	0.8732	80/20	0.8732
961791	AG1-021 C	5.5216	80/20	5.5216
961891	AG1-030 C	37.7604	80/20	37.7604
962041	AG1-048 C	34.5098	80/20	34.5098
962441	AG1-093 C O1	8.4888	80/20	8.4888
963171	AG1-166 C	5.5216	80/20	5.5216
963181	AG1-167 C	5.5216	80/20	5.5216
963191	AG1-168 C	5.5216	80/20	5.5216
963201	AG1-169 C	5.5216	80/20	5.5216
963211	AG1-170 C	5.5216	80/20	5.5216
963301	AG1-179 C	3.8659	80/20	3.8659
963311	AG1-180	1.8835	80/20	1.8835
963321	AG1-181 C O1	32.7592	80/20	32.7592
963361	AG1-185 O1	15.8498	80/20	15.8498
963641	AG1-215 C	2.5767	80/20	2.5767
964111	AG1-272 C	5.3022	80/20	5.3022
964121	AG1-273 C	5.3022	80/20	5.3022
964131	AG1-274 C	5.3022	80/20	5.3022
964241	AG1-285 C O1	18.3810	80/20	18.3810
964261	AG1-287 C	0.5597	80/20	0.5597
964471	AG1-310 C	0.7473	80/20	0.7473
964791	AG1-342 C	3.0915	80/20	3.0915
964821	AG1-345 C	2.2020	80/20	2.2020
965191	AG1-384 C	5.3022	80/20	5.3022
965281	AG1-393 C	5.5216	80/20	5.5216
965451	AG1-413 C O1	5.8764	80/20	5.8764
965591	AG1-427 C	17.6058	80/20	17.6058
965601	AG1-428 C O1	3.2273	80/20	3.2273
965641	AG1-432 C O1	73.6692	80/20	73.6692
965721	AG1-440 C	5.1777	80/20	5.1777
965731	AG1-441 C	5.1777	80/20	5.1777
965771	AG1-445	2.9916	80/20	2.9916
965781	AG1-446	2.9916	80/20	2.9916
965831	AG1-451	12.2782	80/20	12.2782
966621	AG1-532 C	0.4715	80/20	0.4715
966751	AG1-546 C	8.6364	80/20	8.6364
966861	**AG1-557 C O1 (Withdrawn : 12/14/2020)**	**7.3669**	**80/20**	**7.3669**
WEC	WEC	0.0813	Confirmed LTF	0.0813
LGEE	LGEE	0.1659	Confirmed LTF	0.1659
CPLE	CPLE	1.2422	Confirmed LTF	1.2422
CBM-W2	CBM-W2	4.0768	Confirmed LTF	4.0768
NY	NY	0.1233	Confirmed LTF	0.1233
TVA	TVA	0.7980	Confirmed LTF	0.7980
SIGE	SIGE	0.0565	Confirmed LTF	0.0565
CBM-S2	CBM-S2	13.8748	Confirmed LTF	13.8748
CBM-S1	CBM-S1	0.1953	Confirmed LTF	0.1953
MEC	MEC	0.5180	Confirmed LTF	0.5180
LAGN	LAGN	0.9958	Confirmed LTF	0.9958
CBM-W1	CBM-W1	3.3508	Confirmed LTF	3.3508

11.6.7 Index 7

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
169142249	314691	3FARMVIL	DVP	314692	6FARMVIL	DVP	1	DVP_P1-2: LN 298	single	198.06	117.25	119.75	DC	4.95

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313527	AB2-043 C	0.5190	80/20	0.5190
314429	3JTRSVLE	1.0409	80/20	1.0409
314704	3LAWRENC	0.1400	80/20	0.1400
315158	1KERR 1	0.2388	80/20	0.2388
315159	1KERR 2	0.6685	80/20	0.6685
315160	1KERR 3	0.6685	80/20	0.6685
315161	1KERR 4	0.6685	80/20	0.6685
315162	1KERR 5	0.6685	80/20	0.6685
315163	1KERR 6	0.6685	80/20	0.6685
315164	1KERR 7	0.6685	80/20	0.6685
316118	AC1-105 C	1.9644	80/20	1.9644
316129	AC1-054 C	3.1577	80/20	3.1577
316131	AB2-060 C	1.5710	80/20	1.5710
924301	**AB2-077 C O1 (Suspended)**	**2.0004**	**80/20**	**2.0004**
924311	**AB2-078 C O1 (Suspended)**	**2.0004**	**80/20**	**2.0004**
924321	**AB2-079 C O1 (Suspended)**	**2.0004**	**80/20**	**2.0004**
925611	AC1-036 C	0.4104	80/20	0.4104
935221	AD1-157 C	0.6410	80/20	0.6410
936265	AD2-033 C	21.6637	80/20	21.6637
936361	AD2-046 C O1	6.1935	80/20	6.1935
936485	AD2-063 C	20.1177	80/20	20.1177
938371	AE1-056 C	17.5166	80/20	17.5166
939181	AE1-148 C	6.2354	80/20	6.2354
940661	AE2-053 O1	2.3094	80/20	2.3094
942451	AE2-258	2.4541	80/20	2.4541
942461	AE2-259 C O1	33.4608	80/20	33.4608
943911	AF1-059	11.3951	80/20	11.3951
946301	AF1-294 C	10.5152	80/20	10.5152
958211	AF2-115 C	6.1854	80/20	6.1854
958801	AF2-171 C	36.9198	80/20	36.9198
959311	AF2-222 C	31.8180	80/20	31.8180
961791	AG1-021 C	4.9483	80/20	4.9483
961891	AG1-030 C	33.6627	80/20	33.6627
962041	AG1-048 C	30.9270	80/20	30.9270
962441	AG1-093 C O1	5.2385	80/20	5.2385
963171	AG1-166 C	4.9483	80/20	4.9483
963181	AG1-167 C	4.9483	80/20	4.9483
963191	AG1-168 C	4.9483	80/20	4.9483
963201	AG1-169 C	4.9483	80/20	4.9483

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
963211	AG1-170 C	4.9483	80/20	4.9483
963301	AG1-179 C	3.0910	80/20	3.0910
963311	AG1-180	1.5060	80/20	1.5060
963321	AG1-181 C O1	28.6883	80/20	28.6883
963361	AG1-185 O1	13.8802	80/20	13.8802
963641	AG1-215 C	2.3092	80/20	2.3092
964111	AG1-272 C	4.6644	80/20	4.6644
964121	AG1-273 C	4.6644	80/20	4.6644
964131	AG1-274 C	4.6644	80/20	4.6644
964241	AG1-285 C O1	15.6870	80/20	15.6870
964791	AG1-342 C	2.2108	80/20	2.2108
964821	AG1-345 C	1.9730	80/20	1.9730
965191	AG1-384 C	4.6644	80/20	4.6644
965281	AG1-393 C	4.9483	80/20	4.9483
965451	AG1-413 C O1	4.7901	80/20	4.7901
965591	AG1-427 C	15.0419	80/20	15.0419
965601	AG1-428 C O1	2.5804	80/20	2.5804
965641	AG1-432 C O1	66.9216	80/20	66.9216
965721	AG1-440 C	4.0478	80/20	4.0478
965731	AG1-441 C	4.0478	80/20	4.0478
965771	AG1-445	2.3387	80/20	2.3387
965781	AG1-446	2.3387	80/20	2.3387
965831	AG1-451	11.1536	80/20	11.1536
966751	AG1-546 C	6.5405	80/20	6.5405
966861	**AG1-557 C O1 (Withdrawn : 12/14/2020)**	**6.6922**	**80/20**	**6.6922**
WEC	WEC	0.0236	Confirmed LTF	0.0236
LGEE	LGEE	0.0496	Confirmed LTF	0.0496
CPLE	CPLE	0.2361	Confirmed LTF	0.2361
CBM-W2	CBM-W2	0.9498	Confirmed LTF	0.9498
NY	NY	0.0321	Confirmed LTF	0.0321
TVA	TVA	0.1736	Confirmed LTF	0.1736
SIGE	SIGE	0.0158	Confirmed LTF	0.0158
CBM-S2	CBM-S2	2.5056	Confirmed LTF	2.5056
CBM-S1	CBM-S1	0.0441	Confirmed LTF	0.0441
MEC	MEC	0.1367	Confirmed LTF	0.1367
LAGN	LAGN	0.2135	Confirmed LTF	0.2135
CBM-W1	CBM-W1	0.9954	Confirmed LTF	0.9954

11.6.8 Index 8

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
168380292	314701	3LONEPN	DVP	313755	3FLAT CREEK	DVP	1	DVP_P1-2: LN 1045	single	203.98	158.18	164.06	DC	12.0

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314429	3JTRSVLE	2.5234	80/20	2.5234
316131	AB2-060 C	8.5795	80/20	8.5795
936265	AD2-033 C	77.9711	80/20	77.9711
946301	AF1-294 C	25.4906	80/20	25.4906
958211	AF2-115 C	14.9945	80/20	14.9945
961791	AG1-021 C	11.9956	80/20	11.9956
961891	AG1-030 C	89.9667	80/20	89.9667
962041	AG1-048 C	74.9722	80/20	74.9722
963171	AG1-166 C	11.9956	80/20	11.9956
963181	AG1-167 C	11.9956	80/20	11.9956
963191	AG1-168 C	11.9956	80/20	11.9956
963201	AG1-169 C	11.9956	80/20	11.9956
963211	AG1-170 C	11.9956	80/20	11.9956
963641	AG1-215 C	5.5979	80/20	5.5979
964821	AG1-345 C	4.7982	80/20	4.7982
965281	AG1-393 C	11.9956	80/20	11.9956
CALDERWOOD	CALDERWOOD	0.0184	Confirmed LTF	0.0184
NY	NY	0.0205	Confirmed LTF	0.0205
PRAIRIE	PRAIRIE	0.0956	Confirmed LTF	0.0956
CHEOAH	CHEOAH	0.0185	Confirmed LTF	0.0185
COTTONWOOD	COTTONWOOD	0.0777	Confirmed LTF	0.0777
HAMLET	HAMLET	0.0214	Confirmed LTF	0.0214
GIBSON	GIBSON	0.0202	Confirmed LTF	0.0202
BLUEG	BLUEG	0.0642	Confirmed LTF	0.0642
TRIMBLE	TRIMBLE	0.0206	Confirmed LTF	0.0206
CATAWBA	CATAWBA	0.0129	Confirmed LTF	0.0129

11.6.9 Index 9

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
163584443	314702	3KERR	DVP	304102	3GW KING TAP	CPLE	1	DVP_P4-6: CAROLINT122	breaker	199.0	149.77	150.3	DC	2.39

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
313527	AB2-043 C	0.5797	50/50	0.5797
313853	3PONTONDP	0.4064	Adder	0.48
314713	3PAMPLIN	0.8873	Adder	1.04
315158	1KERR 1	0.8424	50/50	0.8424
315159	1KERR 2	2.3588	50/50	2.3588
315160	1KERR 3	2.3588	50/50	2.3588
315161	1KERR 4	2.3588	50/50	2.3588
315162	1KERR 5	2.3588	50/50	2.3588
315163	1KERR 6	2.3588	50/50	2.3588
315164	1KERR 7	2.3588	50/50	2.3588
316118	AC1-105 C	2.4862	Adder	2.92
316129	AC1-054 C	15.8416	50/50	15.8416
316131	AB2-060 C	1.6441	50/50	1.6441
924022	AB2-043 E O1	3.2854	50/50	3.2854
924162	AB2-060 E OP	4.9039	50/50	4.9039
924301	**AB2-077 C O1 (Suspended)**	**2.3786**	**50/50**	**2.3786**
924302	**AB2-077 E O1 (Suspended)**	**1.5858**	**50/50**	**1.5858**
924311	**AB2-078 C O1 (Suspended)**	**2.3786**	**50/50**	**2.3786**
924312	**AB2-078 E O1 (Suspended)**	**1.5858**	**50/50**	**1.5858**
924321	**AB2-079 C O1 (Suspended)**	**2.3786**	**50/50**	**2.3786**
924322	**AB2-079 E O1 (Suspended)**	**1.5858**	**50/50**	**1.5858**
925611	AC1-036 C	0.2090	50/50	0.2090
925612	AC1-036 E	0.7934	50/50	0.7934
925785	AC1-054 E	7.2978	50/50	7.2978
926274	AC1-105 E	1.2215	Adder	1.44
935222	AD1-157 E	0.5470	Adder	0.64
936265	AD2-033 C	12.6220	50/50	12.6220
936266	AD2-033 E	8.4146	50/50	8.4146
936361	AD2-046 C O1	18.0396	50/50	18.0396
936362	AD2-046 E O1	8.2956	50/50	8.2956
936485	AD2-063 C	16.0974	50/50	16.0974
936486	AD2-063 E	10.7316	50/50	10.7316
938371	AE1-056 C	3.5374	Adder	4.16
938372	AE1-056 E	1.9328	Adder	2.27
939181	AE1-148 C	17.4836	50/50	17.4836

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939182	AE1-148 E	11.6557	50/50	11.6557
940661	AE2-053 O1	6.4754	50/50	6.4754
942451	AE2-258	2.7410	50/50	2.7410
942461	AE2-259 C O1	3.7689	Adder	4.43
942462	AE2-259 E O1	2.5126	Adder	2.96
943911	AF1-059	10.7887	Adder	12.69
946301	AF1-294 C	2.5908	Adder	3.05
946302	AF1-294 E	1.7272	Adder	2.03
958211	AF2-115 C	1.5240	Adder	1.79
958212	AF2-115 E	1.0160	Adder	1.2
958801	AF2-171 C	9.1968	Adder	10.82
958802	AF2-171 E	6.1312	Adder	7.21
959311	AF2-222 C	14.9130	50/50	14.9130
959312	AF2-222 E	9.9917	50/50	9.9917
961791	AG1-021 C	0.6462	Adder	1.43
961792	AG1-021 E	0.4308	Adder	0.96
961891	AG1-030 C	11.8413	50/50	11.8413
961892	AG1-030 E	7.8942	50/50	7.8942
962041	AG1-048 C	4.0386	Adder	8.96
962042	AG1-048 E	2.6924	Adder	5.98
962441	AG1-093 C O1	3.5138	Adder	7.8
962442	AG1-093 E O1	1.0694	Adder	2.37
963171	AG1-166 C	0.6462	Adder	1.43
963172	AG1-166 E	0.4308	Adder	0.96
963181	AG1-167 C	0.6462	Adder	1.43
963182	AG1-167 E	0.4308	Adder	0.96
963191	AG1-168 C	0.6462	Adder	1.43
963192	AG1-168 E	0.4308	Adder	0.96
963201	AG1-169 C	0.6462	Adder	1.43
963202	AG1-169 E	0.4308	Adder	0.96
963211	AG1-170 C	0.6462	Adder	1.43
963212	AG1-170 E	0.4308	Adder	0.96
963301	AG1-179 C	1.5479	Adder	3.44
963311	AG1-180	0.7542	Adder	1.67
963321	AG1-181 C O1	16.1673	50/50	16.1673
963361	AG1-185 O1	7.8222	50/50	7.8222
963641	AG1-215 C	0.3016	Adder	0.67
963642	AG1-215 E	0.4523	Adder	1.0
964111	AG1-272 C	2.3755	50/50	2.3755
964112	AG1-272 E	0.7055	50/50	0.7055
964121	AG1-273 C	2.3755	50/50	2.3755
964122	AG1-273 E	0.7055	50/50	0.7055
964131	AG1-274 C	2.3755	50/50	2.3755
964132	AG1-274 E	0.7055	50/50	0.7055
964241	AG1-285 C O1	13.7527	50/50	13.7527
964242	AG1-285 E O1	9.1685	50/50	9.1685
964791	AG1-342 C	1.2895	Adder	2.86
964792	AG1-342 E	1.0132	Adder	2.25
964821	AG1-345 C	0.2594	Adder	0.58
964822	AG1-345 E	0.1729	Adder	0.38
965191	AG1-384 C	2.3755	50/50	2.3755
965192	AG1-384 E	0.7055	50/50	0.7055

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
965281	AG1-393 C	0.6462	Adder	1.43
965282	AG1-393 E	0.4308	Adder	0.96
965451	AG1-413 C O1	2.4036	Adder	5.34
965452	AG1-413 E O1	1.6024	Adder	3.56
965591	AG1-427 C	12.9843	50/50	12.9843
965592	AG1-427 E	8.6745	50/50	8.6745
965601	AG1-428 C O1	1.2922	Adder	2.87
965602	AG1-428 E O1	0.8600	Adder	1.91
965641	AG1-432 C O1	3.9950	Adder	8.87
965642	AG1-432 E O1	2.6634	Adder	5.91
965721	AG1-440 C	16.0191	50/50	16.0191
965722	AG1-440 E	10.6794	50/50	10.6794
965731	AG1-441 C	16.0191	50/50	16.0191
965732	AG1-441 E	10.6794	50/50	10.6794
965771	AG1-445	9.2555	50/50	9.2555
965781	AG1-446	9.2555	50/50	9.2555
965831	AG1-451	0.6658	Adder	1.48
966751	AG1-546 C	34.7517	50/50	34.7517
966752	AG1-546 E	18.6468	50/50	18.6468
966861	**AG1-557 C O1 (Withdrawn : 12/14/2020)**	**0.3995**	**Adder**	**0.89**
966862	**AG1-557 E O1 (Withdrawn : 12/14/2020)**	**0.2663**	**Adder**	**0.59**
G-007A	G-007A	0.1654	Confirmed LTF	0.1654
VFT	VFT	0.4386	Confirmed LTF	0.4386
CALDERWOOD	CALDERWOOD	0.3713	Confirmed LTF	0.3713
PRAIRIE	PRAIRIE	1.2528	Confirmed LTF	1.2528
CHEOAH	CHEOAH	0.3809	Confirmed LTF	0.3809
CBM-N	CBM-N	0.0792	Confirmed LTF	0.0792
COTTONWOOD	COTTONWOOD	1.3629	Confirmed LTF	1.3629
HAMLET	HAMLET	0.8062	Confirmed LTF	0.8062
GIBSON	GIBSON	0.2184	Confirmed LTF	0.2184
BLUEG	BLUEG	0.6701	Confirmed LTF	0.6701
TRIMBLE	TRIMBLE	0.2126	Confirmed LTF	0.2126
CATAWBA	CATAWBA	0.4161	Confirmed LTF	0.4161

11.6.10 Index 10

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
169142276	314707	3MORAN	DVP	314691	3FARMVIL	DVP	1	DVP_P1-2: LN 1045	single	203.98	154.8	160.68	DC	12.0

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314429	3JTRSVLE	2.5234	80/20	2.5234
316131	AB2-060 C	8.5795	80/20	8.5795
936265	AD2-033 C	77.9711	80/20	77.9711
946301	AF1-294 C	25.4906	80/20	25.4906
958211	AF2-115 C	14.9945	80/20	14.9945
961791	AG1-021 C	11.9956	80/20	11.9956
961891	AG1-030 C	89.9667	80/20	89.9667
962041	AG1-048 C	74.9722	80/20	74.9722
963171	AG1-166 C	11.9956	80/20	11.9956
963181	AG1-167 C	11.9956	80/20	11.9956
963191	AG1-168 C	11.9956	80/20	11.9956
963201	AG1-169 C	11.9956	80/20	11.9956
963211	AG1-170 C	11.9956	80/20	11.9956
963641	AG1-215 C	5.5979	80/20	5.5979
964821	AG1-345 C	4.7982	80/20	4.7982
965281	AG1-393 C	11.9956	80/20	11.9956
CALDERWOOD	CALDERWOOD	0.0184	Confirmed LTF	0.0184
NY	NY	0.0205	Confirmed LTF	0.0205
PRAIRIE	PRAIRIE	0.0956	Confirmed LTF	0.0956
CHEOAH	CHEOAH	0.0185	Confirmed LTF	0.0185
COTTONWOOD	COTTONWOOD	0.0777	Confirmed LTF	0.0777
HAMLET	HAMLET	0.0214	Confirmed LTF	0.0214
GIBSON	GIBSON	0.0202	Confirmed LTF	0.0202
BLUEG	BLUEG	0.0642	Confirmed LTF	0.0642
TRIMBLE	TRIMBLE	0.0206	Confirmed LTF	0.0206
CATAWBA	CATAWBA	0.0129	Confirmed LTF	0.0129

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
AB1-173	Brink-Trego 115kV	Engineering and Procurement
AB2-040	Brink 115kV	Engineering and Procurement
AB2-043	Chase City 115kV	Under Construction
AB2-060	Chase City-Lunenburg 115kV	In Service
AB2-077	Buggs Island-Chase City 115kV	Suspended
AB2-078	Buggs Island-Chase City 115kV	Suspended
AB2-079	Buggs Island-Chase City 115kV	Suspended
AB2-174	Emporia-Trego 115kV	In Service
AC1-036	Twittys Creek 34.5kV	Partially in Service - Under Construction
AC1-042	Altavista-Mt. Airy 69kV	Engineering and Procurement
AC1-054	Kerr Dam–Eatons Ferry 115 kV	Engineering and Procurement
AC1-075	Perth-Hickory Grove 115kV	Engineering and Procurement
AC1-080	Perth-Hickory Grove 115kV	Engineering and Procurement
AC1-105	Halifax-Mt. Laurel 115kV	Engineering and Procurement
AC1-145	Gretna DP 69 kV	Engineering and Procurement
AC1-222	Crystal Hill-Halifax 115kV	Engineering and Procurement
AC2-071	Buckingham 35kV	Engineering and Procurement
AD1-055	Crystal Hill-Halifax 115 kV	Engineering and Procurement
AD1-087	Clover-Sedge Hill 230 kV	Active
AD1-088	Briery-Clover 230 kV	Active
AD1-152	Clover-Sedge Hill 230 kV	Active
AD1-157	South Creek 34.5 kV	Engineering and Procurement
AD2-033	Chase City-Lunenburg 115 kV	Active
AD2-046	Boydton DP-Kerr Dam 115 kV	Active
AD2-063	Central-Chase City 115kV	Active
AD2-202	Clover-Sedge Hill 230kV	Active
AE1-056	Red House-South Creek 115 kV	Active
AE1-108	Bremo-Scottsville 138 kV	Active
AE1-148	Kerr Dam-Ridge Rd 115 kV	Active
AE1-230	Shockoe 69 kV	Active
AE2-053	Kerr Dam-Ridge Road 115 kV	Active
AE2-092	Kidds Store-Sherwood 115 kV	Active
AE2-182	Briery-Clover 230 kV	Active
AE2-185	Gladys DP-Stonemill Switching Station 69 kV	Active
AE2-187	Shockoe DP-Chatham 69 kV	Active
AE2-258	Chase City 115 kV	Active
AE2-259	Curdsville-Willis Mtn 115 kV	Active
AE2-283	Gladys-Stone Mill 69 kV	Active
AE2-291	Grit DP-Perth 115 kV	Active

Queue Number	Project Name	Status
AE2-292	Grit DP-Perth 115 kV	Active
AF1-058	Welco 34.5 kV	Engineering and Procurement
AF1-059	Brodnax-South Hill 115 kV	Active
AF1-173	Gretna DP-Shockoe DP 69 kV	Active
AF1-292	Fields 34.5kV	Active
AF1-293	Kidds Store-Fort Union 115 kV	Active
AF1-294	Jetersville-Ponton 115 kV	Active
AF1-323	Scottsville-Colleen 138 kV	Active
AF2-107	Clifford 138 kV	Active
AF2-115	Jetersville-Ponton 115 kV	Active
AF2-171	Madisonville 115 kV	Active
AF2-222	Madisonville DP-Twitty's Creek 115 kV	Active
AF2-266	Clover 230 kV	Active
AF2-297	Sedge Hill 115 kV	Active
AF2-299	Fields 34.5 kV	Active
AF2-302	Scottsville-Colleen 138 kV	Active
AF2-397	Fork Union-Mt. Eagle 230 kV	Active
AF2-403	Shockoe DP-Chatham 69 kV	Active
AG1-021	Jetersville-Ponton 115 kV	Active
AG1-022	Scottsville-Colleen 138 kV	Active
AG1-030	Victoria DP-Martin DP 115 kV	Active
AG1-048	Jetersville-Ponton 115 kV	Active
AG1-093	Halifax-Chase City 115 kV	Active
AG1-098	Briery-Clover 230 kV	Active
AG1-105	Clover-Sedge Hill 230 kV	Active
AG1-123	Amherst-Riverville138 kV	Active
AG1-124	Gladstone 138 kV	Active
AG1-166	Lone Pine 115 kV	Active
AG1-167	Lone Pine 115 kV	Active
AG1-168	Lone Pine 115 kV	Active
AG1-169	Lone Pine 115 kV	Active
AG1-170	Lone Pine 115 kV	Active
AG1-176	Briery-Clover 230 kV	Active
AG1-179	Brunswick 69 kV	Active
AG1-180	Brunswick 69 kV	Active
AG1-181	Pamplin-Chase City 115 kV	Active
AG1-185	Pamplin-Chase City 115 kV	Active
AG1-209	Gretna 12.5 kV	Active
AG1-215	Fort Pickett 13.2 kV	Active
AG1-272	Twitty's Creek 115 kV	Active
AG1-273	Twitty's Creek 115 kV	Active
AG1-274	Twitty's Creek 115 kV	Active
AG1-275	Gladys DP-Stone Mill 69 kV	Active
AG1-276	Gladys DP-Stone Mill 69 kV	Active
AG1-284	Bremo-Cunningham DP 115 kV	Active
AG1-285	Chase City-Central 115 kV	Active
AG1-286	Johnson Mountain 138 kV	Active
AG1-287	South Boston 12.5 kV	Active
AG1-310	Crystal Hill-Perth 115 kV	Active
AG1-342	Dryburg 115 kV	Active
AG1-345	Crewe 12.5 kV	Active
AG1-347	Briery DP-Clover 230 kV	Active

Queue Number	Project Name	Status
AG1-384	Twitty's Creek 115 kV	Active
AG1-393	Fort Pickett DP 34.5 kV	Active
AG1-413	South Hill-Bordnax 115 kV	Active
AG1-426	Bremo-Scottsville 138 kV	Active
AG1-427	Chase City-Drakes Branch 115 kV	Active
AG1-428	Danieltown 69 kV	Active
AG1-432	Curdsville DP-Willis Mt. 115 kV	Active
AG1-440	Palmer Springs 115 kV	Active
AG1-441	Palmer Springs 115 kV	Active
AG1-445	Palmer Spring 115 kV	Active
AG1-446	Palmer Springs 115 kV	Active
AG1-451	Curdsville DP-Willis Mt. 115 kV	Active
AG1-494	Boxwood-Riverville 138 kV	Active
AG1-532	Fields 34.5 kV	Active
AG1-539	Grit DP-Perth 115 kV	Active
AG1-546	Ebony-Elams Road 115 kV	Active
AG1-547	Mount Airy-Chatham 69 kV	Active
AG1-550	Mount Eagle-Fork Union 230 kV	Active
AG1-557	Curdsville DP 115 kV	Withdrawn

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
DVP_P1-2: LN 298	CONTINGENCY 'DVP_P1-2: LN 298' OPEN BRANCH FROM BUS 314677 TO BUS 314692 CKT 1 /* 6BUCKING 230.00 - 6FARMVIL 230.00 OPEN BRANCH FROM BUS 314677 TO BUS 314747 CKT 1 /* 6BUCKING 230.00 - 6BREMO 230.00 OPEN BRANCH FROM BUS 314691 TO BUS 314692 CKT 2 /* 3FARMVIL 115.00 - 6FARMVIL 230.00 OPEN BUS 314677 /* ISLAND: 6BUCKING 230.00 OPEN BUS 924032 /* ISLAND: AB2-045 E 230.00 OPEN BUS 932511 /* ISLAND: AC2-071 C 230.00 OPEN BUS 932512 /* ISLAND: AC2-071 E 230.00 END
DVP_P1-2: LN 1045	CONTINGENCY 'DVP_P1-2: LN 1045' OPEN BRANCH FROM BUS 313898 TO BUS 314267 CKT 1 /* 3BUTCHER CRK115.00 - 3CHASCTY2 115.00 END
DVP_P4-6: CAROLIN T122	CONTINGENCY 'DVP_P4-6: CAROLIN T122' /* CAROLINA 115 KV OPEN BRANCH FROM BUS 314559 TO BUS 315126 CKT 1 /* 3CAROLNA 115.00 - 1ROARAP2 14.400 OPEN BRANCH FROM BUS 314559 TO BUS 315128 CKT 1 /* 3CAROLNA 115.00 - 1ROARAP4 14.400 OPEN BUS 315126 /* ISLAND: 1ROARAP2 14.400 OPEN BUS 315128 /* ISLAND: 1ROARAP4 14.400 OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00 OPEN BRANCH FROM BUS 313722 TO BUS 314559 CKT 1 /* 3OCCONEECHEE115.00 - 3CAROLNA 115.00 OPEN BRANCH FROM BUS 313723 TO BUS 314559 CKT 1 /* 3PECAN 115.00 - 3CAROLNA 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314835 CKT 1 /* 3CAROLNA 115.00 - 3CAROL_1 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314578 CKT 1 /* 3CAROLNA 115.00 - 3HORNRTN 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314585 CKT 1 /* 3CAROLNA 115.00 - 3L GASTN 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314600 CKT 1 /* 3CAROLNA 115.00 - 3PLHITP 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* 3CAROLNA 115.00 - 6CAROLNA 230.00 OPEN BUS 314559 /* 3CAROLNA 115.00 KV OPEN BUS 314835 /* ISLAND: 3CAROL_1 115.00 END

Contingency Name	Contingency Definition
DVP_P4-2: 102802	CONTINGENCY 'DVP_P4-2: 102802' /* CAROLINA 115 KV OPEN BRANCH FROM BUS 313722 TO BUS 314559 CKT 1 /* 3OCCONEECHEE115.00 - 3CAROLNA 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00 OPEN BRANCH FROM BUS 313723 TO BUS 314559 CKT 1 /* 3PECAN 115.00 - 3CAROLNA 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314835 CKT 1 /* 3CAROLNA 115.00 - 3CAROL_1 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314600 CKT 1 /* 3CAROLNA 115.00 - 3PLHITP 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* 3CAROLNA 115.00 - 6CAROLNA 230.00 END
DVP_P1-2: LN 556-C	CONTINGENCY 'DVP_P1-2: LN 556-C' OPEN BRANCH FROM BUS 964930 TO BUS 966360 CKT 1 /* AG1-357 TAP 500.00 - AG1-055 TAP 500.00 END
DVP_P1-2: LN 235-A	CONTINGENCY 'DVP_P1-2: LN 235-A' OPEN BRANCH FROM BUS 313802 TO BUS 314268 CKT 1 /* 6PRINCE EDW 230.00 - 6BRIERY 230.00 OPEN BRANCH FROM BUS 313802 TO BUS 314692 CKT 1 /* 6PRINCE EDW 230.00 - 6FARMVIL 230.00 OPEN BRANCH FROM BUS 314268 TO BUS 964840 CKT 1 /* 6BRIERY 230.00 - AG1-347 TAP 230.00 OPEN BRANCH FROM BUS 314691 TO BUS 314692 CKT 1 /* 3FARMVIL 115.00 - 6FARMVIL 230.00 OPEN BUS 313802 /* ISLAND: 6PRINCE EDW 230.00 OPEN BUS 314268 /* ISLAND: 6BRIERY 230.00 END
DVP_P1-3: 6SEDGE HILL-TX#1	CONTINGENCY 'DVP_P1-3: 6SEDGE HILL-TX#1' OPEN BRANCH FROM BUS 314696 TO BUS 314697 CKT 1 /* 3SEDGE HILL 115.00 - 6SEDGE HILL 230.00 END

Contingency Name	Contingency Definition
DVP_P7-1: LN 22-90	CONTINGENCY 'DVP_P7-1: LN 22-90' /* . OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00 OPEN BRANCH FROM BUS 314571 TO BUS 316125 CKT 1 /* 3EATON F 115.00 - AC1-054 TAP 115.00 OPEN BRANCH FROM BUS 314702 TO BUS 316125 CKT 1 /* 3KERR 115.00 - AC1-054 TAP 115.00 OPEN BUS 314571 /* ISLAND: 3EATON F 115.00 OPEN BUS 316125 /* ISLAND: AC1-054 TAP 115.00 OPEN BUS 316126 /* ISLAND: AC1-054 MAIN115.00 OPEN BUS 316127 /* ISLAND: AC1-054 COL222.860 OPEN BUS 316128 /* ISLAND: AC1-054 COL122.860 OPEN BUS 316129 /* ISLAND: AC1-054 C 0.3850 OPEN BUS 925785 /* ISLAND: AC1-054 E 0.3850 OPEN BRANCH FROM BUS 314265 TO BUS 314584 CKT 1 /* 3FIVEFORKSDP115.00 - 3LITTLTN 115.00 OPEN BRANCH FROM BUS 314265 TO BUS 314673 CKT 1 /* 3FIVEFORKSDP115.00 - 3PALMERSPRNG115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314585 CKT 1 /* 3CAROLNA 115.00 - 3L GASTN 115.00 OPEN BRANCH FROM BUS 314584 TO BUS 314585 CKT 1 /* 3LITTLTN 115.00 - 3L GASTN 115.00 OPEN BUS 314265 /* ISLAND: 3FIVEFORKSDP115.00 OPEN BUS 314584 /* ISLAND: 3LITTLTN 115.00 OPEN BUS 314585 /* ISLAND: 3L GASTN 115.00 END
DVP_P1-3: 6SEDGE HILL-TX#2	CONTINGENCY 'DVP_P1-3: 6SEDGE HILL-TX#2' OPEN BRANCH FROM BUS 314696 TO BUS 314697 CKT 2 /* 3SEDGE HILL 115.00 - 6SEDGE HILL 230.00 END
DVP_P1-2: LN 2028-B	CONTINGENCY 'DVP_P1-2: LN 2028-B' OPEN BRANCH FROM BUS 966790 TO BUS 314765 CKT 1 /* AF2-397 TAP 230.00 - 6MTEAGLE 230.00 OPEN BRANCH FROM BUS 314749 TO BUS 314765 CKT 1 /* 6CHARLVL 230.00 - 6MTEAGLE 230.00 OPEN BUS 314765 /* ISLAND: 6MTEAGLE 230.00 OPEN BUS 926451 /* ISLAND: AC1-116 C 230.00 OPEN BUS 926452 /* ISLAND: AC1-116 E 230.00 END
Base Case	

Contingency Name	Contingency Definition
DVP_P4-2: 13002	CONTINGENCY 'DVP_P4-2: 13002' /* CAROLINA 115 KV OPEN BRANCH FROM BUS 314559 TO BUS 314600 CKT 1 /* 3CAROLNA 115.00 - 3PLHITP 115.00 OPEN BRANCH FROM BUS 314595 TO BUS 314600 CKT 1 /* 3PL HILL 115.00 - 3PLHITP 115.00 OPEN BRANCH FROM BUS 314600 TO BUS 314615 CKT 1 /* 3PLHITP 115.00 - 3SKIPPERS 115.00 OPEN BUS 314595 /* ISLAND: 3PL HILL 115.00 OPEN BUS 314600 /* ISLAND: 3PLHITP 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00 OPEN BRANCH FROM BUS 313722 TO BUS 314559 CKT 1 /* 3OCCONEECHEE115.00 - 3CAROLNA 115.00 OPEN BRANCH FROM BUS 313723 TO BUS 314559 CKT 1 /* 3PECAN 115.00 - 3CAROLNA 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314835 CKT 1 /* 3CAROLNA 115.00 - 3CAROL_1 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* 3CAROLNA 115.00 - 6CAROLNA 230.00 END
314765 6MTEAGLE 230 966790 AG1-550 TAP 230 1	CONTINGENCY '314765 6MTEAGLE 230 966790 AG1-550 TAP 230 1' OPEN BRANCH FROM BUS 314765 TO BUS 966790 CKT 1 END
DVP_P1-2: LN 158	CONTINGENCY 'DVP_P1-2: LN 158' OPEN BRANCH FROM BUS 313755 TO BUS 314701 CKT 1 /* 3FLAT CREEK 115.00 - 3LONEPN 115.00 OPEN BRANCH FROM BUS 313755 TO BUS 314707 CKT 1 /* 3FLAT CREEK 115.00 - 3MORAN 115.00 OPEN BRANCH FROM BUS 314519 TO BUS 314701 CKT 1 /* 3LONEPINE_1 115.00 - 3LONEPN 115.00 OPEN BRANCH FROM BUS 314691 TO BUS 314707 CKT 1 /* 3FARMVIL 115.00 - 3MORAN 115.00 OPEN BUS 313755 /* ISLAND: 3FLAT CREEK 115.00 OPEN BUS 314519 /* ISLAND: 3LONEPINE_1 115.00 OPEN BUS 314707 /* ISLAND: 3MORAN 115.00 END

12 Short Circuit Analysis

The following Breakers are overdutied:

None.

12.1 System Reinforcements - Short Circuit

None.

13 Affected Systems

13.1 TVA

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

13.2 Duke Energy Progress

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

14 Attachment 1: One Line Diagram