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SUPPLEMENTAL PRE-FILED DIRECT TESTIMONY OF DONNA ROBICHAUD ON BEHALF OF SWEETLEAF SOLAR LLC

ATTACHMENT A

Generation Interconnection Feasibility Study Report

For

PJM Generation Interconnection Request Queue Position AD1-056/AD1-057

Hornertown - Hathaway 230kV 61.3 MW Capacity / 94 MW Energy

February 2018

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 Sweet Leaf Solar LLC, the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Virginia Electric and Power Company (VEPCO).

Preface

The intent of the Feasibility Study is to determine a plan, with high level estimated cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the IC. The IC may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the IC 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. The possibility of sharing the reinforcement costs with other projects may be identified in the Feasibility Study, but the actual allocation will be deferred until the Impact Study is performed.

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

General

The IC has proposed a solar generating facility located in Halifax County, North Carolina. The installed AD1-056/AD1-057 facilities will have a total capability of 94 MW with 61.3 MW of this output being recognized by PJM as capacity. The proposed in-service date for this project is June 1, 2020. **This study does not imply an ITO commitment to this in-service date.**

Point of Interconnection

AD1-056/AD1-057 will interconnect with the ITO transmission system via one of the following Points of Interconnection:

Option 1: AD1-056/AD1-057 will interconnect via a new three breaker ring bus switching station that connects the Hornertown – Hathaway 230kV line.

Option 2: AD1-056/AD1-057 will interconnect via a new three breaker ring bus switching station that connects the Cox – South Justice 115kV line.

Cost Summary

The AD1-056/AD1-057 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	$ 1,800,000
Direct Connection Network Upgrades	$ 6,300,000
Non Direct Connection Network Upgrades	$ 1,000,000
Total Costs	**$ 9,100,000**

In addition, the AD1-056/AD1-057 project may be responsible for a contribution to the following costs:

Description	Total Cost
New System Upgrades	$ 0
Previously Identified Upgrades	$ 152,670,000
Total Costs	**$ 152,670,000**

PJM Open Access Transmission Tariff (OATT) section 217.3A outlines cost allocation rules. The rules are further clarified in PJM Manual 14A Attachment B. For New System Upgrades, the cost allocation rule differ depending on whether the minimum amount of upgrades to resolve a single reliability criteria violation will cost less than $5,000,000. For upgrades estimated to cost less than $5,000,000 the allocation of costs will not occur outside of the Queue in which the need for the Network Upgrade was identified. Cost allocation within the Queue will be contingent each Queue projects Distribution Factor on the overloaded facility. For upgrades estimated to cost $5,000,000 or greater the allocation of costs will start with the first Queue project to cause the need for the upgrade. Later queue projects will receive cost allocation contingent on their contribution to the violation and are allocated to the queues that have not closed less than 5 years following the execution of the first Interconnection Service Agreement which identifies the need for this upgrade.

The Feasibility Study is used to make a preliminary determination of the type and scope of Attachment Facilities, Local Upgrades, and Network Upgrades that will be necessary to accommodate the Interconnection Request and to provide the Interconnection Customer a preliminary estimate of the time that will be required to construct any necessary facilities and upgrades and the Interconnection Customer's cost responsibility. The System Impact Study provides refined and comprehensive estimates of cost responsibility and construction lead times for new facilities and system upgrades. Facilities Studies will include, commensurate with the degree of engineering specificity as provided in the Facilities Study Agreement, good faith estimates of the cost, determined in accordance with Section 217 of the Tariff,

(a) to be charged to each affected New Service Customer for the Facilities and System Upgrades that are necessary to accommodate this queue project;

(b) the time required to complete detailed design and construction of the facilities and upgrades; and

(c) a description of any site-specific environmental issues or requirements that could reasonably be anticipated to affect the cost or time required to complete construction of such facilities and upgrades.

System Reinforcements

Violation #	Upgrade Description	Upgrade Cost
	***NEW SYSTEM REINFORCEMENTS**	
8	Line #254 AB2-100 Tap – Clubhouse 230 kV: wreck and rebuild the AB2-100 TAP-Clubhouse 230kV line of 2 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $5,000,000 and 24-28 months to engineer, permit and construct. A VA CPCN is required.	In Below. See Violation #34-36
9, 10, 14	Line #2056 AD1-057 – Morning Star 230 kV: wreck and rebuild the line of 15 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $36,000,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	In Below. See Violation #37-38
	CONTRIBUTIONS TO PREVIOUS SYSTEM REINFORCEMENTS	
15, 18, 27	Line #1024 South Justice – Cox DP – Chestnut 115 kV: wreck and rebuild the line of 6.5 miles to increase its line rating to 262 MVA (normal), 287 MVA (emergency), and 349 MVA (load dump). It is estimated to cost $12,860,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	$12,860,000
16, 33	Line #1001 Chestnut – Whitakers – Battleboro 115 kV: wreck and rebuild the line of 9 miles to increase its line rating to 262 MVA (normal), 287 MVA (emergency), and 349 MVA (load dump). It is estimated to cost $18,520,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	$18,520,000
17	The limiting element is not on the VEPCO facilities. The external Duke / Progress Energy (i.e. Non-PJM) Transmission Owner will evaluate this violation during the System Impact Study phase	TBD
19, 20	Line #249 Carson – Chaparal – Locks 230 kV: wreck and rebuild the line of 10 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $25,875,000 and 44-48 months to engineer, permit and construct. A VA CPCN is required.	$25,875,000
21-23	The limiting element is not on the VEPCO facilities. The external Duke / Progress Energy (i.e. Non-PJM) Transmission Owner will evaluate this violation during the System Impact Study phase	TBD
24, 25	Line #238 Clubhouse to Sapony 230 kV: wreck and rebuild the line of 17 miles to increase its line rating to 1047 MVA (normal), 1047 MVA (emergency), and 1204 MVA (load dump). It is estimated to cost $41,900,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	$41,900,000

Violation #	Upgrade Description	Upgrade Cost
26	The limiting element is not on the VEPCO facilities. The external Duke / Progress Energy (i.e. Non-PJM) Transmission Owner will evaluate this violation during the System Impact Study phase	TBD
28-32	Line #2141 Lakeview – Carolina 230 kV: wreck and rebuild the line of 1.5 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $3,625,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	$3,625,000
34-36 (8)	Line #254 AB2-100 Tap – Clubhouse 230 kV: wreck and rebuild the AB2-100 TAP-Clubhouse 230kV line of 2 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $5,000,000 and 24-28 months to engineer, permit and construct. A VA CPCN is required.	$5,000,000
37, 38 (9, 10,14)	Line #2056 AD1-057 – Morning Star 230 kV: wreck and rebuild the line of 15 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $36,000,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	$36,000,000
39	AEP upgrades items 1-10 detailed in the "Contributions to Previously Identified System Reinforcement" section of this report. The total costs for AEP upgrades items 1 – 10 is $8,890,000. The estimated schedule is 24 to 36 months after signing the Interconnection Service Agreement.	$8,890,000
	Total Network Upgrades	**$152,670,000**

*Note:
For New System Reinforcements, only violations in which the AD1-056/AD1-057 overloads the facility are included in the table above. Costs for New System Reinforcement for which AD1-056/AD1-057 is not the first project to overload the facility are included for reference in the later part of this report. Cost allocation will be provided in the Impact Study.

Attachment Facilities

Generation Substation: Install metering and associated protection equipment. Estimated Cost $600,000.

Transmission: Construct approximately one span of 230kV Attachment line between the generation substation and a new AD1-056/AD1-057 Switching Station. The estimated cost for this work is $1,200,000.

The estimated total cost of the Attachment Facilities is $1,800,000. It is estimated to take 18-24 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.

Direct Connection Cost Estimate

Substation: Establish the new 230 kV AD1-057 Switching Substation (interconnection substation). The arrangement in the substation will be as shown in Attachment 1. The estimated cost of this work scope is $6,300,000. It is estimated to take 24-36 months to complete this work upon execution of an Interconnection Construction Service Agreement.

Non-Direct Network Upgrades:

Transmission: Install transmission structure in-line with transmission line to allow the proposed interconnection switching station to be interconnected with the transmission system. Estimated cost is $1,000,000 and is estimated to take 24-30 months to complete.

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.

Interconnection Customer Requirements

ITO's Facility Connection Requirements as posted on PJM's website
http://www.pjm.com/~/media/planning/plan-standards/private-dominion/facility-connection-requirements1.ashx

Voltage Ride Through Requirements - The Customer Facility shall be designed to remain in service (not trip) for voltages and times as specified for the Eastern Interconnection in Attachment 1 of NERC Reliability Standard PRC-024-1, and successor Reliability Standards, for both high and low voltage conditions, irrespective of generator size, subject to the permissive trip exceptions established in PRC-024-1 (and successor Reliability Standards).

Frequency Ride Through Requirements - The Customer Facility shall be designed to remain in service (not trip) for frequencies and times as specified in Attachment 2 of NERC Reliability Standard PRC-024-1, and successor Reliability Standards, for both high and low frequency condition, irrespective of generator size, subject to the permissive trip exceptions established in PRC-024-1 (and successor Reliability Standards).

Reactive Power - The Generation Interconnection Customer shall design its non-synchronous Customer Facility with the ability to maintain a power factor of at least 0.95 leading to 0.95 lagging measured at the generator's terminals.

Revenue Metering and SCADA Requirements

PJM Requirements

The IC 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 Sections 24.1 and 24.2.

Meteorological Data Reporting Requirement

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

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

OPTION 1:

Network Impacts

PJM assessed the impact of the proposed Queue Project as an injection into the ITO's transmission system, for compliance with NERC Reliability Criteria. The system was assessed using the summer 2021 RTEP case. When performing analysis, ITO Criteria considers a transmission facility overloaded if it exceeds 94% of its emergency rating under single contingency (normal and stressed system conditions). A full listing of the ITO's Planning Criteria and interconnection requirements can be found in the ITO's Facility Connection Requirements which are publicly available at: http://www.dom.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 NERC Category C Contingency Conditions (Bus Fault, Tower Line, N-1-1, and Stuck Breaker scenarios) allow for re-dispatch of generating units to resolve potential reliability deficiencies. For ITO 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. The results of these studies are discussed in more detail below.

The Queue Project AD1-057 (AD1-056 & AD1-057 studied as 1 project, AD1-057) was evaluated as a 94.0 MW (Capacity 61.3 MW) injection tapping the Hornertown – Hathaway 230kV line in the ITO area. Project AD1-057 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AD1-057 was studied with a commercial probability of 53%. Potential network impacts were as follows:

Contingency Descriptions

The following contingencies resulted in overloads:

Contingency Name	Description
AEP_P1-2_#1377	CONTINGENCY 'AEP_P1-2_#1377' OPEN BRANCH FROM BUS 242514 TO BUS 242520 CKT 1 / 242514 05J.FERR 765 242520 05J.FERR 500 1 OPEN BRANCH FROM BUS 242520 TO BUS 306719 CKT 1 / 242520 05J.FERR 500 306719 8ANTIOCH 500 1 END

Contingency Name	Description
AEP_P4_#7589_05J.FERR 765	CONTINGENCY 'AEP_P4_#7589_05J.FERR 765' OPEN BRANCH FROM BUS 242514 TO BUS 242520 CKT 1 / 242514 05J.FERR 765 242520 05J.FERR 500 1 OPEN BRANCH FROM BUS 242514 TO BUS 242684 CKT 2 / 242514 05J.FERR 765 242684 05J.FERR 138 2 OPEN BRANCH FROM BUS 242520 TO BUS 306719 CKT 1 / 242520 05J.FERR 500 306719 8ANTIOCH 500 1 END
DVP_P1-2: LN 2056-A	CONTINGENCY 'DVP_P1-2: LN 2056-A' OPEN BRANCH FROM BUS 313845 TO BUS 934330 CKT 1 /* 6HATHAWAY 230.00 - AD1-057 TAP 230.00 END
DVP_P1-2: LN 2058	CONTINGENCY 'DVP_P1-2: LN 2058' OPEN BRANCH FROM BUS 304222 TO BUS 313845 CKT 1 /* 6ROCKYMT230T230.00 - 6MORNSTR 230.00 END
DVP_P1-2: LN 2060	CONTINGENCY 'DVP_P1-2: LN 2060' OPEN BRANCH FROM BUS 314561 TO BUS 314599 CKT 1 /* 6CAROLNA 230.00 - 6ROA VAL 230.00 END
DVP_P1-2: LN 2126	CONTINGENCY 'DVP_P1-2: LN 2126' OPEN BRANCH FROM BUS 314203 TO BUS 314594 CKT 1 /* 6MACKEYS 230.00 - 6PLYMOTH 230.00 OPEN BRANCH FROM BUS 314594 TO BUS 314616 CKT 1 /* 6PLYMOTH 230.00 - 6TRWBRDG 230.00 OPEN BUS 314594 /* ISLAND END
DVP_P1-2: LN 2131_FSA	CONTINGENCY 'DVP_P1-2: LN 2131_FSA' OPEN BRANCH FROM BUS 314203 TO BUS 314637 CKT 1 /* 6MACKEYS 230.00 - 6EDENTON 230.00 OPEN BRANCH FROM BUS 314637 TO BUS 916040 CKT 1 /* 6EDENTON 230.00 - Z1-036 TAP 230.00 OPEN BRANCH FROM BUS 314662 TO BUS 916040 CKT 1 /*

Contingency Name	Description
	ADDED BY JT FOR FULL FSA TAP REMOVAL OPEN BUS 314637 /* ISLAND END
DVP_P1-2: LN 2131A	CONTINGENCY 'DVP_P1-2: LN 2131A' OPEN BRANCH FROM BUS 314662 TO BUS 916040 CKT 1 /* 6S HERTFORD 230.00 - Z1-036 TAP 230.00 OPEN BRANCH FROM BUS 314651 TO BUS 314662 CKT 1 /* 6WINFALL 230.00 - 6S HERTFORD 230.00 OPEN BUS 314662 /* ISLAND END
DVP_P1-2: LN 2141	CONTINGENCY 'DVP_P1-2: LN 2141' OPEN BRANCH FROM BUS 314561 TO BUS 314583 CKT 1 /* 6CAROLNA 230.00 - 6LAKEVEW 230.00 END
DVP_P1-2: LN 2181	CONTINGENCY 'DVP_P1-2: LN 2181' OPEN BUS 304226 /* ISLAND: 6PA-RMOUNT#4115.00 OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00 OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6HATHAWAY 230.00 - 6NASH 230.00 OPEN BUS 314591 /* ISLAND: 6NASH 230.00 END
DVP_P1-2: LN 238	CONTINGENCY 'DVP_P1-2: LN 238' OPEN BRANCH FROM BUS 314282 TO BUS 314435 CKT 1 /* 6CARSON 230.00 - 6SAPONY 230.00 OPEN BRANCH FROM BUS 314435 TO BUS 314563 CKT 1 /* 6SAPONY 230.00 - 6CLUBHSE 230.00 OPEN BRANCH FROM BUS 314562 TO BUS 314563 CKT 1 /* 3CLUBHSE 115.00 - 6CLUBHSE 230.00 OPEN BUS 314435 /* ISLAND

Contingency Name	Description
	END
DVP_P1-2: LN 239	CONTINGENCY 'DVP_P1-2: LN 239' OPEN BRANCH FROM BUS 314579 TO BUS 314583 CKT 1 /* 6HORNRTN 230.00 - 6LAKEVEW 230.00 END
DVP_P1-2: LN 246	CONTINGENCY 'DVP_P1-2: LN 246' OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* 6SUFFOLK 230.00 - 6NUCO TP 230.00 OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00 OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00 OPEN BUS 314575 /* ISLAND OPEN BUS 314590 /* ISLAND END
DVP_P1-2: LN 557	CONTINGENCY 'DVP_P1-2: LN 557' OPEN BRANCH FROM BUS 314214 TO BUS 314903 CKT 1 /* 6CHCKAHM 230.00 - 8CHCKAHM 500.00 OPEN BRANCH FROM BUS 314903 TO BUS 314908 CKT 1 /* 8CHCKAHM 500.00 - 8ELMONT 500.00 END
DVP_P1-2: LN 563	CONTINGENCY 'DVP_P1-2: LN 563' OPEN BRANCH FROM BUS 314902 TO BUS 314914 CKT 1 /* 8CARSON 500.00 - 8MDLTHAN 500.00 END
DVP_P4-2: 2020T2144	CONTINGENCY 'DVP_P4-2: 2020T2144' /* WINFALL 230 KV OPEN BRANCH FROM BUS 313851 TO BUS 314638 CKT 1 /* 6ECITYDP2 230.00 - 6ELIZ CT 230.00 OPEN BRANCH FROM BUS 313851 TO BUS 314639 CKT 1 /* 6ECITYDP2 230.00 - 6TANGLEW 230.00 OPEN BRANCH FROM BUS 314639 TO BUS 314651 CKT 1 /* 6TANGLEW 230.00 - 6WINFALL 230.00

Contingency Name	Description
	OPEN BUS 313851 /* ISLAND: 6ECITYDP2 230.00 OPEN BUS 314639 /* ISLAND: 6TANGLEW 230.00 OPEN BUS 913391 /* ISLAND: Y1-086 C 230.00 OPEN BUS 913392 /* ISLAND: Y1-086 E 230.00 OPEN BUS 917121 /* ISLAND: Z2-027 C 230.00 OPEN BUS 917122 /* ISLAND: Z2-027 E 230.00 OPEN BRANCH FROM BUS 314651 TO BUS 901080 CKT 1 /* 6WINFALL 230.00 - W1-029 230.00 END
DVP_P4-2: 23872	CONTINGENCY 'DVP_P4-2: 23872' /*_ CARSON OPEN BRANCH FROM BUS 314282 TO BUS 314435 CKT 1 /*L238 CARSON SAPONY OPEN BRANCH FROM BUS 314435 TO BUS 314563 CKT 1 /*L238 SAPONY CLUBHOUSE OPEN BRANCH FROM BUS 314563 TO BUS 314562 CKT 1 /*CLUBHOUSE TX1 230-115 OPEN BRANCH FROM BUS 314282 TO BUS 314902 CKT 1 /*CARSON TX2 500-230 OPEN BRANCH FROM BUS 314282 TO BUS 314455 CKT 1 /*CARSON SC172 END
DVP_P4-2: 238T2002	CONTINGENCY 'DVP_P4-2: 238T2002' /*_ CARSON OPEN BRANCH FROM BUS 314331 TO BUS 314288 CKT 1 /*L2002 POE COGENTRIX OPEN BRANCH FROM BUS 314288 TO BUS 314282 CKT 1 /*L2002 COGENTRIX CARSON OPEN BRANCH FROM BUS 314331 TO BUS 314329 CKT 1 /*POE TX5 230-115 OPEN BRANCH FROM BUS 314282 TO BUS 314435 CKT 1

Contingency Name	Description
	/*L238 CARSON SAPONY OPEN BRANCH FROM BUS 314435 TO BUS 314563 CKT 1 /*L238 SAPONY CLUBHOUSE OPEN BRANCH FROM BUS 314563 TO BUS 314562 CKT 1 /*CLUBHOUSE TX1 230-115 END
DVP_P4-2: 24682	CONTINGENCY 'DVP_P4-2: 24682' /* 24682 @ SUFFOLK OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* SUFFOLK - NUCOR TAP OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* NUCOR TAP - EARLEYS OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* SUFFOLK 230-115 TX#5 OPEN BRANCH FROM BUS 314928 TO BUS 314537 CKT 2 /* SUFFOLK 500-230 TX#8 END
DVP_P4-2: 246T2034	CONTINGENCY 'DVP_P4-2: 246T2034' /* EARLEYS OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 246 OPEN BRANCH FROM BUS 314575 TO BUS 314537 CKT 1 /* 246 OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 246 - NUCOR OPEN BRANCH FROM BUS 314569 TO BUS 933450 CKT 1 /* 2034 END
DVP_P4-2: 246T247	CONTINGENCY 'DVP_P4-2: 246T247' /* SUFFOLK 230 KV OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* 6SUFFOLK 230.00 - 6NUCO TP 230.00 OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00 OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00

Contingency Name	Description
	OPEN BUS 314575 /* ISLAND: 6NUCO TP 230.00 OPEN BUS 314590 /* ISLAND: 6NUCOR 230.00 OPEN BRANCH FROM BUS 314537 TO BUS 314648 CKT 1 /* 6SUFFOLK 230.00 - 6SUNBURY 230.00 OPEN BRANCH FROM BUS 314648 TO BUS 901080 CKT 1 /* 6SUNBURY 230.00 - W1-029 230.00 OPEN BUS 314648 /* ISLAND: 6SUNBURY 230.00 END
DVP_P4-2: 254T2141	CONTINGENCY 'DVP_P4-2: 254T2141' /* LAKEVIEW OPEN BRANCH FROM BUS 314583 TO BUS 314561 CKT 1 /* 2141 OPEN BRANCH FROM BUS 314583 TO BUS 924510 CKT 1 /* 254 END
DVP_P4-2: 562T563	CONTINGENCY 'DVP_P4-2: 562T563' /*CARSON OPEN BRANCH FROM BUS 314902 TO BUS 314923 CKT 1 /*CARSON TO MIDLOTHIAN OPEN BRANCH FROM BUS 314914 TO BUS 314902 CKT 1 /*CARSON 500.00 - 8SEPTA 500.00 END
DVP_P7-1: LN 2058-2181	CONTINGENCY 'DVP_P7-1: LN 2058-2181' OPEN BRANCH FROM BUS 304222 TO BUS 313845 CKT 1 /* 6ROCKYMT230T230.00 - 6HATHAWAY 230.00 OPEN BUS 304226 /* ISLAND: 6PA-RMOUNT#4115.00 OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00 OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6HATHAWAY 230.00 - 6NASH 230.00 OPEN BUS 314591 /* ISLAND: 6NASH 230.00

Contingency Name	Description
	END
DVP_P7-1: LN 238-249	CONTINGENCY 'DVP_P7-1: LN 238-249' OPEN BRANCH FROM BUS 314282 TO BUS 314435 CKT 1 /* 6CARSON 230.00 - 6SAPONY 230.00 OPEN BRANCH FROM BUS 314435 TO BUS 314563 CKT 1 /* 6SAPONY 230.00 - 6CLUBHSE 230.00 OPEN BRANCH FROM BUS 314562 TO BUS 314563 CKT 1 /* 3CLUBHSE 115.00 - 6CLUBHSE 230.00 OPEN BUS 314435 /* ISLAND OPEN BRANCH FROM BUS 314282 TO BUS 314285 CKT 1 /* 6CARSON 230.00 - 6CHRL249 230.00 OPEN BRANCH FROM BUS 314285 TO BUS 314316 CKT 1 /* 6CHRL249 230.00 - 6LOCKS 230.00 OPEN BRANCH FROM BUS 314314 TO BUS 314316 CKT 1 /* 3LOCKS 115.00 - 6LOCKS 230.00 OPEN BUS 314285 /* ISLAND END
DVP_P7-1: LN 54-2012_B	CONTINGENCY 'DVP_P7-1: LN 54-2012_B' OPEN BRANCH FROM BUS 919690 TO BUS 314581 CKT 1 /* AA2-053 TAP 115.00 - 3JACKSON 115.00 OPEN BRANCH FROM BUS 314581 TO BUS 933460 CKT 1 /* 3JACKSON 115.00 - AC2-159 TAP 115.00 OPEN BUS 314581 /* ISLAND OPEN BRANCH FROM BUS 314266 TO BUS 314569 CKT 1 /* 6NORTHAMPTON230.00 - 6EARLEYS 230.00 OPEN BRANCH FROM BUS 314266 TO BUS 314599 CKT 1 /* 6NORTHAMPTON230.00 - 6ROA VAL 230.00 OPEN BUS 314266 /* ISLAND END
DVP_P7-1: LN 54-2012_C	CONTINGENCY 'DVP_P7-1: LN 54-2012_C' OPEN BRANCH FROM BUS 314568 TO BUS 314625 CKT 1 /* 3EARLEYS 115.00 - 3AULANDR 115.00

Contingency Name	Description
	OPEN BRANCH FROM BUS 933460 TO BUS 314626 CKT 1 /* AC2-159 TAP 115.00 - 3WOODLND 115.00 OPEN BRANCH FROM BUS 314625 TO BUS 314626 CKT 1 /* 3AULANDR 115.00 - 3WOODLND 115.00 OPEN BUS 314625 /* ISLAND OPEN BUS 314626 /* ISLAND OPEN BRANCH FROM BUS 314266 TO BUS 314569 CKT 1 /* 6NORTHAMPTON230.00 - 6EARLEYS 230.00 OPEN BRANCH FROM BUS 314266 TO BUS 314599 CKT 1 /* 6NORTHAMPTON230.00 - 6ROA VAL 230.00 OPEN BUS 314266 /* ISLAND END
DVP_P7-1: LN 81-2056	CONTINGENCY 'DVP_P7-1: LN 81-2056' OPEN BRANCH FROM BUS 314559 TO BUS 314578 CKT 1 /* 3CAROLNA 115.00 - 3HORNRTN 115.00 OPEN BRANCH FROM BUS 314578 TO BUS 314598 CKT 1 /* 3HORNRTN 115.00 - 3ROAN DP 115.00 OPEN BRANCH FROM BUS 314598 TO BUS 314628 CKT 1 /* 3ROAN DP 115.00 - 3DARLINGT DP115.00 OPEN BUS 314578 /* ISLAND: 3HORNRTN 115.00 OPEN BUS 314598 /* ISLAND: 3ROAN DP 115.00 OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00 OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6MORNSTR 230.00 - 6NASH 230.00 OPEN BRANCH FROM BUS 304226 TO BUS 304222 CKT 1 /* 6PA-RMOUNT#4230.00 - 6ROCKYMT230T OPEN BUS 304226 /* ISLAND OPEN BUS 314591 /* ISLAND: 6NASH 230.00 END

Summer Peak Analysis – 2021

Generator Deliverability

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

	Contingency		Affected		Bus			Power	Loading %		Rating		MW	
#	Type	Name	Area	Facility Description	From	To	Cir.	Flow	Initial	Final	Type	MVA	Contribution	Ref
1	N-1	DVP_P1-2: LN 2181	DVP - CPLE	6MORNSTR-6ROCKYMT230T 230 kV line	313845	304222	1	DC	99.49	104.77	ER	374	19.74	
2	N-1	DVP_P1-2: LN 2058	DVP - DVP	6MORNSTR-6NASH 230 kV line	313845	314591	1	DC	89.24	93.72	ER	449	20.13	1
3	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6EARLEYS-6NUCO TP 230 kV line	314569	314575	1	DC	84.78	86.56	ER	572	10.19	2
4	N-1	DVP_P1-2: LN 2131_FSA	DVP - DVP	6EARLEYS-6NUCO TP 230 kV line	314569	314575	1	DC	84.09	85.88	ER	572	10.2	
5	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6NUCO TP-6SUFFOLK 230 kV line	314575	314537	1	DC	78.76	80.55	ER	572	10.19	3
6	N-1	DVP_P1-2: LN 2131_FSA	DVP - DVP	6NUCO TP-6SUFFOLK 230 kV line	314575	314537	1	DC	78.05	79.84	ER	572	10.2	
7	N-1	DVP_P1-2: LN 246	DVP - DVP	6LAKEVEW-AB2-100 TAP 230 kV line	314583	924510	1	DC	92.81	97.05	ER	375	15.83	4
8	N-1	DVP_P1-2: LN 2141	DVP - DVP	6LAKEVEW-AB2-100 TAP 230 kV line	314583	924510	1	DC	99.93	105.7	ER	375	21.64	
9	N-1	DVP_P1-2: LN 2141	DVP - DVP	AD1-057 TAP-6MORNSTR 230 kV line	934330	313845	1	DC	99.35	108.3	ER	442	39.54	
10	N-1	DVP_P1-2: LN 2060	DVP - DVP	AD1-057 TAP-6MORNSTR 230 kV line	934330	313845	1	DC	96.02	104.21	ER	442	36.18	

Multiple Facility Contingency

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

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
11	LFFB	DVP_P4-2: 2020T2144	DVP - DVP	6SAPONY-6CARSON 230 kV line	314435	314282	1	DC	95.73	98.43	LD	830	22.31	5
12	LFFB	DVP_P4-2: 24682	DVP - DVP	6S HERTFORD-6WINFALL 230 kV line	314662	314651	1	DC	82.99	84.18	LD	897	10.74	6
13	LFFB	DVP_P4-2: 24682	DVP - DVP	Z1-036 TAP-6S HERTFORD 230 kV line	916040	314662	1	DC	87.08	88.28	LD	897	10.74	7
14	DCTL	DVP_P7-1: LN 54-2012_B	DVP - DVP	AD1-057 TAP-6MORNSTR 230 kV line	934330	313845	1	DC	97.54	107.88	LD	541	55.94	
11	LFFB	DVP_P4-2: 2020T2144	DVP - DVP	6SAPONY-6CARSON 230 kV line	314435	314282	1	DC	95.73	98.43	LD	830	22.31	5
12	LFFB	DVP_P4-2: 24682	DVP - DVP	6S HERTFORD-6WINFALL 230 kV line	314662	314651	1	DC	82.99	84.18	LD	897	10.74	6
13	LFFB	DVP_P4-2: 24682	DVP - DVP	Z1-036 TAP-6S HERTFORD 230 kV line	916040	314662	1	DC	87.08	88.28	LD	897	10.74	7
14	DCTL	DVP_P7-1: LN 54-2012_B	DVP - DVP	AD1-057 TAP-6MORNSTR 230 kV line	934330	313845	1	DC	97.54	107.88	LD	541	55.94	

Short Circuit

(Summary of impacted circuit breakers)

New circuit breakers found to be over-duty:

None

Contributions to previously identified circuit breakers found to be over-duty:

None

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)

	Contingency		Affected		Bus			Power	Loading %		Rating		MW	
#	Type	Name	Area	Facility Description	From	To	Cir.	Flow	Initial	Final	Type	MVA	Contribution	Ref
15	LFFB	DVP_P4-2: 254T2141	DVP - DVP	3CHESTNUT-3COX DP 115 kV line	313719	314577	1	DC	102.75	104.75	LD	174	8.55	8
16	N-1	DVP_P1-2: LN 2056-A	DVP - DVP	3CHESTNUT-3WITAKRS 115 kV line	313719	314623	1	DC	160.27	162.91	ER	134	3.54	9
17	DCTL	DVP_P7-1: LN 81-2056	DVP - CPLE	6MORNSTR-6ROCKYMT230T 230 kV line	313845	304222	1	DC	138.85	146.98	ER	374	30.33	10
18	N-1	DVP_P1-2: LN 2056-A	DVP - DVP	3SO JUSTICE-3COX DP 115 kV line	313858	314577	1	DC	108.94	111.09	ER	165	3.56	11
19	LFFB	DVP_P4-2: 562T563	DVP - DVP	6CARSON-6CHRL249 230 kV line	314282	314285	1	DC	108.68	109.22	LD	684	9.02	12
20	LFFB	DVP_P4-2: 562T563	DVP - DVP	6CHRL249-6LOCKS 230 kV line	314285	314316	1	DC	105.87	106.41	LD	684	9.02	13
21	DCTL	DVP_P7-1: LN 2058-2181	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	DC	441.93	460.23	ER	93	17.02	14
22	N-1	DVP_P1-2: LN 2181	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	DC	135.75	139.61	ER	93	3.58	

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
23	N-1	DVP_P1-2: LN 2058	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	DC	131.88	135.57	ER	93	3.43	
24	LFFB	DVP_P4-2: 246T247	DVP - DVP	6CLUBHSE-6SAPONY 230 kV line	314563	314435	1	DC	125.88	129.7	LD	637	24.29	15
25	LFFB	DVP_P4-2: 246T2034	DVP - DVP	6CLUBHSE-6SAPONY 230 kV line	314563	314435	1	DC	128.65	132.69	LD	637	25.66	
26	DCTL	DVP_P7-1: LN 2058-2181	DVP - CPLE	6EVERETS-6GREENVILE T 230 kV line	314574	304451	1	DC	118.91	121.74	ER	478	13.49	16
27	N-1	DVP_P1-2: LN 2056-A	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	126.12	128.77	ER	134	3.56	17
28	LFFB	DVP_P4-2: 23872	DVP - DVP	6LAKEVEW-6CAROLNA 230 kV line	314583	314561	1	DC	139.91	147.98	LD	433	34.98	18
29	LFFB	DVP_P4-2: 238T2002	DVP - DVP	6LAKEVEW-6CAROLNA 230 kV line	314583	314561	1	DC	139.61	147.68	LD	433	34.97	
30	DCTL	DVP_P7-1: LN 238-249	DVP - DVP	6LAKEVEW-6CAROLNA 230 kV line	314583	314561	1	DC	139.47	147.54	LD	433	34.97	
31	N-1	DVP_P1-2: LN 238	DVP - DVP	6LAKEVEW-6CAROLNA 230 kV line	314583	314561	1	DC	133.16	139.24	ER	375	22.8	
32	N-1	DVP_P1-2: LN 2056-A	DVP - DVP	6LAKEVEW-6CAROLNA 230 kV line	314583	314561	1	DC	127.85	137.13	ER	375	34.8	
33	N-1	DVP_P1-2: LN 2056-A	DVP - DVP	3WITAKRS-3BTLEBRO 115 kV line	314623	314554	1	DC	161.06	163.69	ER	134	3.54	19

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
34	LFFB	DVP_P4-2: 246T247	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	122.52	127.92	LD	459	24.66	20
35	N-1	DVP_P1-2: LN 246	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	104.15	108.38	ER	375	15.83	
36	N-1	DVP_P1-2: LN 2141	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	113	118.77	ER	375	21.64	
37	LFFB	DVP_P4-2: 254T2141	DVP - DVP	AD1-057 TAP-6MORNSTR 230 kV line	934330	313845	1	DC	120.69	138.03	LD	541	93.81	21
38	DCTL	DVP_P7-1: LN 54-2012_C	DVP - DVP	AD1-057 TAP-6MORNSTR 230 kV line	934330	313845	1	DC	100.14	110.49	LD	541	55.94	
39	LFFB	AEP_P4_#7589_05J.FERR 765	AEP - AEP	05EDAN 1-05DANVL2 138 kV line	242631	242620	1	DC	109.47	110.15	ER	415	6.29	22

Steady-State Voltage Requirements

(Summary of the VAR requirements based upon the results of the steady-state voltage studies)

To be determined during Impact Study

Stability and Reactive Power Requirement for Low Voltage Ride Through

(Summary of the VAR requirements based upon the results of the dynamic studies)

To be determined during Impact Study

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)

#	Overloaded Facility	Upgrade Description	Network Upgrade Number	Upgrade Cost
1	6MORNSTR-6ROCKYMT230T 230 kV line	The limiting element is not on the VEPCO facilities. The external Duke / Progress Energy (i.e. Non-PJM) Transmission Owner will evaluate this violation during the System Impact Study phase	Pending	TBD
2	6MORNSTR-6NASH 230 kV line	Line #2181 Hathaway – Nash 230 kV: wreck and rebuild the line of 1 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $2,250,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	Pending	$2,250,000
3, 4, 5, 6	6EARLEYS-6NUCO TP 230 kV line ; 6NUCO TP-6SUFFOLK 230 kV line	Line #246 Earleys – Nucor TP – Suffolk 230 kV: wreck and rebuild the line of 45 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $110,950,000 and 44-48 months to engineer, permit, and construct. A VA CPCN is required.	Pending	$110,950,000
7, 8 (34,35,36)	6LAKEVEW-AB2-100 TAP 230 kV line	Line #254 AB2-100 Tap – Clubhouse 230 kV: wreck and rebuild the AB2-100 TAP-Clubhouse 230kV line of 2 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $5,000,000 and 24-28 months to engineer, permit and construct. A VA CPCN is required.	Pending	$5,000,000
9, 10, 14 (37,38)	AD1-057 TAP-6MORNSTR 230 kV line	Line #2056 AD1-057 – Morning Star 230 kV: wreck and rebuild the line of 15 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $36,000,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	Pending	$36,000,000
11	6SAPONY-6CARSON 230 kV line	Line #238 Sapony to Carson 230 kV: wreck and rebuild the line of 12 miles to increase its line rating to 1047 MVA (normal), 1047 MVA (emergency), and 1204 MVA (load dump). It is estimated to cost $29,425,000 and 30-36 months to engineer and construct.	Pending	$29,425,000

#	Overloaded Facility	Upgrade Description	Network Upgrade Number	Upgrade Cost
12, 13	6S HERTFORD-6WINFALL 230 kV line	Line #2131 Z1-036 – Tap S Hertford – Winfall 230 kV: wreck and rebuild the line of 8 miles to increase its line rating to 1047 MVA (normal), 1047 MVA (emergency), and 1204 MVA (load dump). It is estimated to cost $19,875,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	Pending	$19,875,000
			Total New Network Upgrades	**$203,500,000**

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a %

#	Overloaded Facility	Upgrade Description	Network Upgrade Number	Upgrade Cost
15, 18, 27	3CHESTNUT-3COX DP 115 kV line; 3SO JUSTICE-3COX DP 115 kV line	Line #1024 South Justice – Cox DP – Chestnut 115 kV: wreck and rebuild the line of 6.5 miles to increase its line rating to 262 MVA (normal), 287 MVA (emergency), and 349 MVA (load dump). It is estimated to cost $12,860,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	Pending	$12,860,000
16, 33	3CHESTNUT-3WITAKRS 115 kV line ; 3WITAKRS-3BTLEBRO 115 kV line	Line #1001 Chestnut – Whitakers – Battleboro 115 kV: wreck and rebuild the line of 9 miles to increase its line rating to 262 MVA (normal), 287 MVA (emergency), and 349 MVA (load dump). It is estimated to cost $18,520,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	Pending	$18,520,000
17	6MORNSTR-6ROCKYMT230T 230 kV line	The limiting element is not on the VEPCO facilities. The external Duke / Progress Energy (i.e. Non-PJM) Transmission Owner will evaluate this violation during the System Impact Study phase	Pending	TBD
19, 20	6CARSON-6CHRL249 230 kV line	Line #249 Carson – Chaparal – Locks 230 kV: wreck and rebuild the line of 10 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $25,875,000 and 44-48 months to engineer, permit and construct. A VA CPCN is required.	Pending	$25,875,000

21-23	3BTLEBRO-3ROCKYMT115T 115 kV line	The limiting element is not on the VEPCO facilities. The external Duke / Progress Energy (i.e. Non-PJM) Transmission Owner will evaluate this violation during the System Impact Study phase	Pending	TBD
24, 25	6CLUBHSE-6SAPONY 230 kV line	Line #238 Clubhouse to Sapony 230 kV: wreck and rebuild the line of 17 miles to increase its line rating to 1047 MVA (normal), 1047 MVA (emergency), and 1204 MVA (load dump). It is estimated to cost $41,900,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	Pending	$41,900,000
26	6EVERETS-6GREENVILE T 230 kV line	The limiting element is not on the VEPCO facilities. The external Duke / Progress Energy (i.e. Non-PJM) Transmission Owner will evaluate this violation during the System Impact Study phase	Pending	TBD
28-32	6LAKEVEW-6CAROLNA 230 kV line	Line #2141 Lakeview – Carolina 230 kV: wreck and rebuild the line of 1.5 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $3,625,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	Pending	$3,625,000
34-36 (7, 8)	AB2-100 TAP-6CLUBHSE 230 kV line	Line #254 AB2-100 Tap – Clubhouse 230 kV: wreck and rebuild the AB2-100 TAP-Clubhouse 230kV line of 2 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $5,000,000 and 24-28 months to engineer, permit and construct. A VA CPCN is required.	Pending	$5,000,000
37, 38 (9)	AD1-057 TAP-6MORNSTR 230 kV line	Line #2056 AD1-057 – Morning Star 230 kV: wreck and rebuild the line of 15 miles to increase its line rating to 722 MVA (normal), 722 MVA (emergency), and 830 MVA (load dump). It is estimated to cost $36,000,000 and 30-36 months to engineer, permit, and construct. A VA CPCN is required.	Pending	$36,000,000

39	05EDAN 1-05DANVL2 138 kV line	Limiting Element: AEP Records show ratings S/N: 275 MVA S/E: 361 MVA 1) Switch (1200A) - Danville Sw. CB M - Danville Circuit Breaker M needs to be replaced. Estimated cost: $1,000,000. 2) Sub Cond 1590 AAC 61 Str - Danville Risers - Replace Danville risers, Estimated cost: $100,000. 3) ACSR ~ 336/556 six wire - conductor section 2 - 2.87 miles of conductor will need to be reconductored/rebuilt. Estimated cost: $4.3 million. 4) Relay Thermal limit 1795 Amps - E Danville 1 - An Engineering study needs to be conducted to determine if the relay thermal limit can be adjusted to mitigate the overload. Estimated Cost: $25,000. In addition, new relay packages will be required if the settings cannot be adjusted. Estimated cost: $600,000. 5) Relay Thermal limit 1795 Amps – Danville 2 - An engineering study needs to be conducted to determine if the relay thermal limit can be adjusted to mitigate the overload. Estimated Cost: $25,000. In addition, new relay packages will be required if the settings cannot be adjusted. Estimated cost: $600,000. 6) Relay compliance trip limit 1916 Amps - E Danville (RCTL) - An engineering study needs to be conducted to determine if the relay compliance trip limits settings can be adjusted to mitigate the overload. Estimated Cost: $25,000. In addition, new relay packages will be required if the settings cannot be adjusted. Estimated cost: $600,000. 7) Relay compliance trip limit 1916 Amps - Danville2 (RCTL) - An engineering study needs to be conducted to determine if the relay compliance trip limits settings can be adjusted to mitigate the overload. Estimated Cost: $25,000. In addition, new relay packages will be required if the settings cannot be adjusted. Estimated cost: $600,000. 8) ACSR ~ 1351.5 ~ 45/7 ~ DIPPER - Conductor Section 3 --- 0.03 miles of conductor will need to be re-conductored/rebuilt. Estimated cost: $0.045 Million.		$8,890,000

		9) ACSR ~ 1351.5 ~ 45/7 ~ DIPPER - Conductor Section 1 --- 0.03 miles of conductor will need to be re-conductored/rebuilt. Estimated cost: $0.045 Million 10) Breaker (2000A) Non Oil- E. Danville CB L --- East Danville Circuit Breaker L needs to be replaced, estimated cost: $1,000,000. New Rating: S/N: 351 MVA S/E: 474 MVA. The total costs for AEP upgrades items 1 – 10 outlined above is $8,890,000. The estimated schedule is 24 to 36 months after signing the Interconnection Service Agreement.		
			Total New Network Upgrades	**$152,670,000**

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 IC 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.

Contingency					Bus				Loading %		Rating		
#	Type	Name	Affected Area	Facility Description	From	To	Cir.	Power Flow	Initial	Final	Type	MVA	MW Contribution
40	N-1	DVP_P1-2: LN 239	DVP - DVP	3CHESTNUT-3COX DP 115 kV line	313719	314577	1	DC	99.05	102.03	ER	134	8.89
41	N-1	DVP_P1-2: LN 2181	DVP - CPLE	6MORNSTR-6ROCKYMT230T 230 kV line	313845	304222	1	DC	138.61	146.41	ER	374	30.27
42	N-1	DVP_P1-2: LN 2058	DVP - DVP	6MORNSTR-6NASH 230 kV line	313845	314591	1	DC	122.82	129.44	ER	449	30.87

Contingency					Bus				Loading %		Rating		
#	Type	Name	Affected Area	Facility Description	From	To	Cir.	Power Flow	Initial	Final	Type	MVA	MW Contribution
43	N-1	DVP_P1-2: LN 246	DVP - DVP	6MACKEYS-6EDENTON 230 kV line	314203	314637	1	DC	79.72	81.19	ER	731	10.79
44	N-1	DVP_P1-2: LN 557	DVP - DVP	6CHARCTY-6LAKESIDE 230 kV line	314225	314227	1	DC	99.88	100.14	ER	984	6.89
45	N-1	DVP_P1-2: LN 563	DVP - DVP	6CARSON-6CHRL249 230 kV line	314282	314285	1	DC	98.82	99.34	ER	559	8.41
46	N-1	DVP_P1-2: LN 563	DVP - DVP	6CHESTF B-6BASIN 230 kV line	314287	314276	1	DC	151.12	151.72	ER	449	5.91
47	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6SAPONY-6CARSON 230 kV line	314435	314282	1	DC	116.83	120.12	ER	679	22.3
48	N-1	DVP_P1-2: LN 2181	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	DC	186.61	189.28	ER	93	5.5
49	N-1	DVP_P1-2: LN 238	DVP - DVP	6CAROLNA-6ROA VAL 230 kV line	314561	314599	1	DC	97.59	101.42	ER	548	20.95
50	N-1	DVP_P1-2: LN 2126	DVP - DVP	6CLUBHSE-6SAPONY 230 kV line	314563	314435	1	DC	121.89	125.62	ER	599	22.31
51	Non	Non	DVP - DVP	6CLUBHSE-6SAPONY 230 kV line	314563	314435	1	DC	109.5	113.05	NR	599	21.21
52	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6EARLEYS-6NUCO TP 230 kV line	314569	314575	1	DC	138.31	140.99	ER	572	15.63
53	Non	Non	DVP - DVP	6EARLEYS-6NUCO TP 230 kV line	314569	314575	1	DC	86.12	88.32	NR	572	12.59

Contingency					Bus				Loading %		Rating		
#	Type	Name	Affected Area	Facility Description	From	To	Cir.	Power Flow	Initial	Final	Type	MVA	MW Contribution
54	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6NUCO TP-6SUFFOLK 230 kV line	314575	314537	1	DC	132.29	134.97	ER	572	15.63
55	N-1	DVP_P1-2: LN 238	DVP - DVP	6LAKEVEW-6CAROLNA 230 kV line	314583	314561	1	DC	160.99	170.3	ER	375	34.97
56	Non	Non	DVP - DVP	6LAKEVEW-6CAROLNA 230 kV line	314583	314561	1	DC	106.26	112.3	NR	352	21.25
57	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6LAKEVEW-AB2-100 TAP 230 kV line	314583	924510	1	DC	134.18	140.26	ER	375	22.8
58	Non	Non	DVP - DVP	6LAKEVEW-AB2-100 TAP 230 kV line	314583	924510	1	DC	104.26	110.09	NR	375	21.77
59	N-1	DVP_P1-2: LN 2058	DVP - CPLE	6NASH-6PA-RMOUNT#4 230 kV line	314591	304226	1	DC	112.39	118.72	ER	470	30.87
60	N-1	DVP_P1-2: LN 238	DVP - DVP	6ROA VAL-6NORTHAMPTON 230 kV line	314599	314266	1	DC	97.56	101.38	ER	548	20.95
61	N-1	DVP_P1-2: LN 246	DVP - DVP	6EDENTON-Z1-036 TAP 230 kV line	314637	916040	1	DC	76.32	77.79	ER	733	10.79
62	N-1	DVP_P1-2: LN 246	DVP - DVP	6S HERTFORD-6WINFALL 230 kV line	314662	314651	1	DC	101.2	102.67	ER	733	10.77
63	N-1	DVP_P1-2: LN 246	DVP - DVP	Z1-036 TAP-6S HERTFORD 230 kV line	916040	314662	1	DC	106.21	107.68	ER	733	10.77
64	N-1	DVP_P1-2: LN 246	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	147.3	153.81	ER	375	24.28

Contingency					Bus				Loading %		Rating		
#	Type	Name	Affected Area	Facility Description	From	To	Cir.	Power Flow	Initial	Final	Type	MVA	MW Contribution
65	Non	Non	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	117.94	125.19	NR	375	21.77
66	N-1	DVP_P1-2: LN 238	DVP - DVP	AD1-057 TAP-6MORNSTR 230 kV line	934330	313845	1	DC	113.63	126.89	ER	442	58.84
67	N-1	AEP_P1-2_#1377	AEP - AEP	05EDAN 1-05DANVL2 138 kV line	242631	242620	1	DC	109.44	110.13	ER	415	6.29

Light Load Analysis

Light Load Studies to be conducted during later study phases (as required by PJM Manual 14B).

Affected System Analysis & Mitigation

Duke, Progress & TVA Impacts:

Duke Carolina, Progress, & TVA Impacts to be determined during later study phases (as applicable).

OPTION 2

Network Impacts

PJM assessed the impact of the proposed Queue Project as an injection into the ITO's transmission system, for compliance with NERC Reliability Criteria. The system was assessed using the summer 2021 RTEP case. When performing analysis, ITO Criteria considers a transmission facility overloaded if it exceeds 94% of its emergency rating under single contingency (normal and stressed system conditions). A full listing of the ITO's Planning Criteria and interconnection requirements can be found in the ITO's Facility Connection Requirements which are publicly available at: http://www.dom.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 NERC Category C Contingency Conditions (Bus Fault, Tower Line, N-1-1, and Stuck Breaker scenarios) allow for re-dispatch of generating units to resolve potential reliability deficiencies. For ITO 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. The results of these studies are discussed in more detail below.

The Queue Project AD1-057 (AD1-056 & AD1-057 studied as 1 project, AD1-057) was evaluated as a 94.0 MW (Capacity 61.3 MW) injection tapping the Cox – South justice 115kV line in the ITO area. Project AD1-057 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AD1-057 was studied with a commercial probability of 53%. Potential network impacts were as follows:

Contingency Descriptions

The following contingencies resulted in overloads:

Contingency Name	Description
927140 AC1-208 TAP 314628 3DARLINGT DP 1 115/115-B	CONTINGENCY '927140 AC1-208 TAP 314628 3DARLINGT DP 1 115/115-B' OPEN BRANCH FROM BUS 927140 TO BUS 314628 CKT 1 END

Contingency Name	Description
AEP_P1-2_#1377	CONTINGENCY 'AEP_P1-2_#1377' OPEN BRANCH FROM BUS 242514 TO BUS 242520 CKT 1 / 242514 05J.FERR 765 242520 05J.FERR 500 1 OPEN BRANCH FROM BUS 242520 TO BUS 306719 CKT 1 / 242520 05J.FERR 500 306719 8ANTIOCH 500 1 END
AEP_P4_#7589_05J.FERR 765	CONTINGENCY 'AEP_P4_#7589_05J.FERR 765' OPEN BRANCH FROM BUS 242514 TO BUS 242520 CKT 1 / 242514 05J.FERR 765 242520 05J.FERR 500 1 OPEN BRANCH FROM BUS 242514 TO BUS 242684 CKT 2 / 242514 05J.FERR 765 242684 05J.FERR 138 2 OPEN BRANCH FROM BUS 242520 TO BUS 306719 CKT 1 / 242520 05J.FERR 500 306719 8ANTIOCH 500 1 END
DVP_P1-2: LN 1001	CONTINGENCY 'DVP_P1-2: LN 1001' OPEN BRANCH FROM BUS 313719 TO BUS 314623 CKT 1 /* 3CHESTNUT 115.00 - 3WITAKRS 115.00 OPEN BRANCH FROM BUS 314554 TO BUS 314623 CKT 1 /* 3BTLEBRO 115.00 - 3WITAKRS 115.00 OPEN BUS 314623 /* ISLAND: 3WITAKRS 115.00 OPEN BUS 917341 /* ISLAND: Z2-044 C 115.00 OPEN BUS 917342 /* ISLAND: Z2-044 E 115.00 END
DVP_P1-2: LN 1014	CONTINGENCY 'DVP_P1-2: LN 1014' OPEN BRANCH FROM BUS 314554 TO BUS 313844 CKT 1 /* 3BTLEBRO 115.00 - 3MORNSTR 115.00 END
DVP_P1-2: LN 1015-B	CONTINGENCY 'DVP_P1-2: LN 1015-B' OPEN BRANCH FROM BUS 926200 TO BUS 314603 CKT 1 /* AC1-098 TAP 115.00 - 3SCOT NK 115.00

Contingency Name	Description
	END
DVP_P1-2: LN 123	CONTINGENCY 'DVP_P1-2: LN 123' OPEN BRANCH FROM BUS 304223 TO BUS 314554 CKT 1 /* 3ROCKYMT115T115.00 - 3BTLEBRO 115.00 END
DVP_P1-2: LN 126	CONTINGENCY 'DVP_P1-2: LN 126' OPEN BRANCH FROM BUS 314568 TO BUS 314582 CKT 1 /* 3EARLEYS 115.00 - 3KELFORD 115.00 OPEN BRANCH FROM BUS 314582 TO BUS 314602 CKT 1 /* 3KELFORD 115.00 - 3SAMS HD 115.00 OPEN BRANCH FROM BUS 314602 TO BUS 314603 CKT 1 /* 3SAMS HD 115.00 - 3SCOT NK 115.00 OPEN BUS 314582 /* ISLAND OPEN BUS 314602 /* ISLAND OPEN BUS 314603 /* ISLAND END
DVP_P1-2: LN 130-A	CONTINGENCY 'DVP_P1-2: LN 130-A' OPEN BRANCH FROM BUS 314562 TO BUS 314570 CKT 1 /* 3CLUBHSE 115.00 - 3METCATP 115.00 OPEN BRANCH FROM BUS 314570 TO BUS 314572 CKT 1 /* 3METCATP 115.00 - 3EMPORIA 115.00 OPEN BRANCH FROM BUS 314570 TO BUS 314588 CKT 1 /* 3METCATP 115.00 - 3METCALF 115.00 OPEN BRANCH FROM BUS 314572 TO BUS 925170 CKT 1 /* 3EMPORIA 115.00 - AB2-174 TAP 115.00 OPEN BRANCH FROM BUS 314572 TO BUS 314863 CKT 1 /* 3EMPORIA 115.00 - 3EMPOR_1 115.00 OPEN BUS 314570 /* ISLAND OPEN BUS 314572 /* ISLAND OPEN BUS 314588 /* ISLAND

Contingency Name	Description
	END
DVP_P1-2: LN 2056	CONTINGENCY 'DVP_P1-2: LN 2056' OPEN BRANCH FROM BUS 313845 TO BUS 314579 CKT 1 /* 6HATHAWAY 230.00 - 6HORNRTN 230.00 END
DVP_P1-2: LN 2058	CONTINGENCY 'DVP_P1-2: LN 2058' OPEN BRANCH FROM BUS 304222 TO BUS 313845 CKT 1 /* 6ROCKYMT230T230.00 - 6MORNSTR 230.00 END
DVP_P1-2: LN 2131	CONTINGENCY 'DVP_P1-2: LN 2131A' OPEN BRANCH FROM BUS 314662 TO BUS 916040 CKT 1 /* 6S HERTFORD 230.00 - Z1-036 TAP 230.00 OPEN BRANCH FROM BUS 314651 TO BUS 314662 CKT 1 /* 6WINFALL 230.00 - 6S HERTFORD 230.00 OPEN BUS 314662 /* ISLAND END
DVP_P1-2: LN 2131_FSA	CONTINGENCY 'DVP_P1-2: LN 2131_FSA' OPEN BRANCH FROM BUS 314203 TO BUS 314637 CKT 1 /* 6MACKEYS 230.00 - 6EDENTON 230.00 OPEN BRANCH FROM BUS 314637 TO BUS 916040 CKT 1 /* 6EDENTON 230.00 - Z1-036 TAP 230.00 OPEN BRANCH FROM BUS 314662 TO BUS 916040 CKT 1 /* ADDED BY JT FOR FULL FSA TAP REMOVAL OPEN BUS 314637 /* ISLAND END
DVP_P1-2: LN 2131A	CONTINGENCY 'DVP_P1-2: LN 2131A' OPEN BRANCH FROM BUS 314662 TO BUS 916040 CKT 1 /* 6S HERTFORD 230.00 - Z1-036 TAP 230.00 OPEN BRANCH FROM BUS 314651 TO BUS 314662 CKT 1 /* 6WINFALL 230.00 - 6S HERTFORD 230.00 OPEN BUS 314662 /* ISLAND

Contingency Name	Description
	END
DVP_P1-2: LN 2160-A	CONTINGENCY 'DVP_P1-2: LN 2160-A' OPEN BRANCH FROM BUS 314574 TO BUS 927020 CKT 1 /* 6EVERETS 230.00 - AC1-189 TAP 230.00 END
DVP_P1-2: LN 2181	CONTINGENCY 'DVP_P1-2: LN 2181' OPEN BUS 304226 /* ISLAND: 6PA-RMOUNT#4115.00 OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00 OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6HATHAWAY 230.00 - 6NASH 230.00 OPEN BUS 314591 /* ISLAND: 6NASH 230.00 END
DVP_P1-2: LN 238-A	CONTINGENCY 'DVP_P1-2: LN 238-A' OPEN BRANCH FROM BUS 314282 TO BUS 314435 CKT 1 /* 6CARSON 230.00 - 6SAPONY 230.00 OPEN BRANCH FROM BUS 314435 TO BUS 934070 CKT 1 /* 6SAPONY 230.00 - AD1-034 TAP 230.00 OPEN BUS 314435 /* ISLAND END
DVP_P1-2: LN 246	CONTINGENCY 'DVP_P1-2: LN 246' OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* 6SUFFOLK 230.00 - 6NUCO TP 230.00 OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00 OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00 OPEN BUS 314575 /* ISLAND OPEN BUS 314590 /* ISLAND

Contingency Name	Description
	END
DVP_P1-2: LN 563	CONTINGENCY 'DVP_P1-2: LN 563' OPEN BRANCH FROM BUS 314902 TO BUS 314914 CKT 1 /* 8CARSON 500.00 - 8MDLTHAN 500.00 END
DVP_P1-3: 3EARLEYS-6EARLEYS	CONTINGENCY 'DVP_P1-3: 3EARLEYS-6EARLEYSA' OPEN BRANCH FROM BUS 314568 TO BUS 314569 CKT 2 END
DVP_P1-3: 3EARLEYS-6EARLEYSA	CONTINGENCY 'DVP_P1-3: 3EARLEYS-6EARLEYSA' OPEN BRANCH FROM BUS 314568 TO BUS 314569 CKT 2 END
DVP_P1-3: 3MORNSTR-6MORNSTR	CONTINGENCY 'DVP_P1-3: 3MORNSTR-6MORNSTR' OPEN BRANCH FROM BUS 313844 TO BUS 313845 CKT 1 END
DVP_P4-2: 12342	CONTINGENCY 'DVP_P4-2: 12342' /*BATTLEBORO OPEN BUS 314554 /*BATTLEBORO 115KV BUS OPEN BUS 314834 /*BATTLEBORO 115KV CAP END
DVP_P4-2: 13002	CONTINGENCY 'DVP_P4-2: 13002' /* CAROLINA OPEN BUS 314600 /* LINE 130 OPEN BUS 314595 /* LINE 130 OPEN BUS 314612 /* LINE 130 OPEN BUS 314615 /* LINE 130 OPEN BUS 314572 /* LINE 130 OPEN BUS 314863 /* LINE 130

Contingency Name	Description
	OPEN BUS 314570 /* LINE 130 OPEN BUS 314588 /* LINE 130 OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* TX. #4 OPEN BRANCH FROM BUS 314559 TO BUS 314259 CKT Z1 /* LINE 56 OPEN BRANCH FROM BUS 314559 TO BUS 919690 CKT 1 /* LINE 54 OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* LINE 22 DECREASE BUS 314559 LOAD BY 100 PERCENT /* REMOVE ALL LOAD AT CAROLINA END
DVP_P4-2: 201262	CONTINGENCY 'DVP_P4-2: 201262' /* EARLEYS OPEN BRANCH FROM BUS 314569 TO BUS 314266 CKT 1 /* 2012 OPEN BRANCH FROM BUS 314266 TO BUS 314599 CKT 1 /* 2012 OPEN BRANCH FROM BUS 314569 TO BUS 314568 CKT 1 /* TX. #3 END
DVP_P4-2: 2012TH4	CONTINGENCY 'DVP_P4-2: 2012TH4' /* EARLEYS OPEN BRANCH FROM BUS 314569 TO BUS 314266 CKT 1 /* 2012 OPEN BRANCH FROM BUS 314266 TO BUS 314599 CKT 1 /* 2012 OPEN BRANCH FROM BUS 314569 TO BUS 314568 CKT 2 /* TX. #4 END
DVP_P4-2: 2202	CONTINGENCY 'DVP_P4-2: 2202' /* CAROLINA OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* LINE 22 OPEN BRANCH FROM BUS 314571 TO BUS 925780 CKT 1 /*

Contingency Name	Description
	LINE 22 OPEN BRANCH FROM BUS 314559 TO BUS 314259 CKT Z1 /* LINE 56 OPEN BRANCH FROM BUS 314559 TO BUS 919690 CKT 1 /* LINE 54 OPEN BRANCH FROM BUS 314559 TO BUS 314600 CKT 1 /* LINE 130 OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* TX. #4 DECREASE BUS 314559 LOAD BY 100 PERCENT /* REMOVE ALL LOAD AT CAROLINA END
DVP_P4-2: 24662	CONTINGENCY 'DVP_P4-2: 24662' /* EARLEYS OPEN BRANCH FROM BUS 314568 TO BUS 314569 CKT 1 /* TX. #3 OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 246 OPEN BRANCH FROM BUS 314575 TO BUS 314537 CKT 1 /* 246 OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 246 - NUCOR END
DVP_P4-2: 24682	CONTINGENCY 'DVP_P4-2: 24682' /* 24682 @ SUFFOLK OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* SUFFOLK - NUCOR TAP OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* NUCOR TAP - EARLEYS OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* SUFFOLK 230-115 TX#5 OPEN BRANCH FROM BUS 314928 TO BUS 314537 CKT 2 /* SUFFOLK 500-230 TX#8 END

Contingency Name	Description
DVP_P4-2: 246T2034	CONTINGENCY 'DVP_P4-2: 246T2034' /* EARLEYS OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 246 OPEN BRANCH FROM BUS 314575 TO BUS 314537 CKT 1 /* 246 OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 246 - NUCOR OPEN BRANCH FROM BUS 314569 TO BUS 933450 CKT 1 /* 2034 END
DVP_P4-2: 246T247	CONTINGENCY 'DVP_P4-2: 246T247' /* SUFFOLK 230 KV OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* 6SUFFOLK 230.00 - 6NUCO TP 230.00 OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00 OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00 OPEN BUS 314575 /* ISLAND: 6NUCO TP 230.00 OPEN BUS 314590 /* ISLAND: 6NUCOR 230.00 OPEN BRANCH FROM BUS 314537 TO BUS 314648 CKT 1 /* 6SUFFOLK 230.00 - 6SUNBURY 230.00 OPEN BRANCH FROM BUS 314648 TO BUS 901080 CKT 1 /* 6SUNBURY 230.00 - W1-029 230.00 OPEN BUS 314648 /* ISLAND: 6SUNBURY 230.00 END
DVP_P4-2: 254T2141	CONTINGENCY 'DVP_P4-2: 254T2141' /* LAKEVIEW OPEN BRANCH FROM BUS 314583 TO BUS 314561 CKT 1 /* 2141 OPEN BRANCH FROM BUS 314583 TO BUS 924510 CKT 1 /* 254

Contingency Name	Description
	END
DVP_P4-2: 5402	CONTINGENCY 'DVP_P4-2: 5402' /* CAROLINA OPEN BRANCH FROM BUS 314559 TO BUS 919690 CKT 1 /* LINE 54 OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* LINE 22 OPEN BRANCH FROM BUS 314559 TO BUS 314259 CKT Z1 /* LINE 56 OPEN BRANCH FROM BUS 314559 TO BUS 314600 CKT 1 /* LINE 130 OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* TX. #4 DECREASE BUS 314559 LOAD BY 100 PERCENT /* REMOVE ALL LOAD AT CAROLINA END
DVP_P4-2: 5602	CONTINGENCY 'DVP_P4-2: 5602' /* CAROLINA 115 KV OPEN BRANCH FROM BUS 313723 TO BUS 314604 CKT 1 /* 3PECAN 115.00 - 3SEABORD 115.00 OPEN BRANCH FROM BUS 314558 TO BUS 314587 CKT 1 /* 3BOYKINS 115.00 - 3MARGTSV 115.00 OPEN BRANCH FROM BUS 314587 TO BUS 314604 CKT 1 /* 3MARGTSV 115.00 - 3SEABORD 115.00 OPEN BUS 314587 /* ISLAND: 3MARGTSV 115.00 OPEN BUS 314604 /* ISLAND: 3SEABORD 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00 OPEN BRANCH FROM BUS 314559 TO BUS 919690 CKT 1 /* 3CAROLNA 115.00 - AA2-053 TAP 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 /*

Contingency Name	Description
	3CAROLNA 115.00 - 6CAROLNA 230.00 END
DVP_P4-2: 562T563	CONTINGENCY 'DVP_P4-2: 562T563' /*CARSON OPEN BRANCH FROM BUS 314902 TO BUS 314923 CKT 1 /*CARSON TO MIDLOTHIAN OPEN BRANCH FROM BUS 314914 TO BUS 314902 CKT 1 /*CARSON 500.00 - 8SEPTA 500.00 END
DVP_P4-2: 8042	CONTINGENCY 'DVP_P4-2: 8042' /* BATTLEBORO OPEN BUS 314554 /*BATTLEBORO 115KV BUS OPEN BUS 314556 /*LINE 80 OPEN BUS 314567 /*LINE 80 OPEN BUS 314205 /*LINE 80 OPEN BUS 314834 /*BATTLEBORO 115KV CAP END
DVP_P4-2: 8142	CONTINGENCY 'DVP_P4-2: 8142' /* BATTLEBORO OPEN BUS 314554 /*BATTLEBORO 115KV BUS OPEN BUS 314556 /*LINE 80 OPEN BUS 314567 /*LINE 80 OPEN BUS 314205 /*LINE 80 OPEN BUS 314834 /*BATTLEBORO 115KV CAP OPEN BUS 314623 /*LINE 81 OPEN BUS 314577 /*LINE 81 OPEN BUS 314628 /*LINE 81 OPEN BUS 314598 /*LINE 81

Contingency Name	Description
	OPEN BUS 314578 /*LINE 81 END
DVP_P4-5: T122C	CONTINGENCY 'DVP_P4-5: T122C' /* CAROLINA OPEN BUS 314559 /* CAROLINA 115KV BUS OPEN BUS 315126 /* ROANOKE RAPIDS GEN 1 AND 2 OPEN BUS 315128 /* ROANOKE RAPIDS GEN 3 AND 4 OPEN BRANCH FROM BUS 314559 TO BUS 314561 CKT 1 /* TX. #4 END
DVP_P7-1: LN 2058-2181	CONTINGENCY 'DVP_P7-1: LN 2058-2181' OPEN BRANCH FROM BUS 304222 TO BUS 313845 CKT 1 /* 6ROCKYMT230T230.00 - 6HATHAWAY 230.00 OPEN BUS 304226 /* ISLAND: 6PA-RMOUNT#4115.00 OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00 OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6HATHAWAY 230.00 - 6NASH 230.00 OPEN BUS 314591 /* ISLAND: 6NASH 230.00 END
DVP_P7-1: LN 81-2056	CONTINGENCY 'DVP_P7-1: LN 81-2056' OPEN BRANCH FROM BUS 314559 TO BUS 314578 CKT 1 /* 3CAROLNA 115.00 - 3HORNRTN 115.00 OPEN BRANCH FROM BUS 314578 TO BUS 314598 CKT 1 /* 3HORNRTN 115.00 - 3ROAN DP 115.00 OPEN BRANCH FROM BUS 314598 TO BUS 314628 CKT 1 /* 3ROAN DP 115.00 - 3DARLINGT DP115.00 OPEN BUS 314578 /* ISLAND: 3HORNRTN 115.00

Contingency Name	Description
	OPEN BUS 314598 /* ISLAND: 3ROAN DP 115.00 OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00 OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6MORNSTR 230.00 - 6NASH 230.00 OPEN BRANCH FROM BUS 304226 TO BUS 304222 CKT 1 /* 6PA-RMOUNT#4230.00 - 6ROCKYMT230T OPEN BUS 304226 /* ISLAND OPEN BUS 314591 /* ISLAND: 6NASH 230.00 END

Summer Peak Analysis – 2021

Generator Deliverability

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

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
1	N-1	DVP_P1-2: LN 130-A	DVP - DVP	6CAROLNA 230/115 kV transformer	314559	314561	1	DC	95.79	99.53	ER	240	8.97	
2	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6EARLEYS-6NUCO TP 230 kV line	314569	314575	1	DC	84.8	86.74	ER	572	11.08	1
3	N-1	DVP_P1-2: LN 2131_FSA	DVP - DVP	6EARLEYS-6NUCO TP 230 kV line	314569	314575	1	DC	84.1	86.04	ER	572	11.09	
4	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6NUCO TP-6SUFFOLK 230 kV line	314575	314537	1	DC	78.76	80.7	ER	572	11.08	2
5	Non	Non	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	92.62	118.43	NR	123	31.79	
6	N-1	DVP_P1-2: LN 1001	DVP - DVP	3KELFORD-3EARLEYS 115 kV line	314582	314568	1	DC	92.27	107.65	ER	143	21.97	
7	N-1	DVP_P1-2: LN 246	DVP - DVP	6LAKEVEW-AB2-100 TAP 230 kV line	314583	924510	1	DC	92.81	95.54	ER	375	10.18	
8	N-1	DVP_P1-2: LN 130-A	DVP - DVP	6LAKEVEW-AB2-100 TAP 230 kV line	314583	924510	1	DC	93.1	95.86	ER	375	10.34	
9	N-1	DVP_P1-2: LN 1001	DVP - DVP	3ROAN DP-3HORNRTN 115 kV line	314598	314578	1	DC	76.42	100.18	ER	165	39.3	

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
10	N-1	DVP_P1-2: LN 1001	DVP - DVP	3SAMS HD-3KELFORD 115 kV line	314602	314582	1	DC	95.18	111.52	ER	134	21.98	
11	N-1	927140 AC1-208 TAP 314628 3DARLING T DP 1 115/115-B	DVP - DVP	3SAMS HD-3KELFORD 115 kV line	314602	314582	1	DC	90.29	102.84	ER	134	16.86	
12	N-1	DVP_P1-2: LN 1001	DVP - DVP	3SCOT NK-3SAMS HD 115 kV line	314603	314602	1	DC	96.66	113.01	ER	134	21.98	
13	N-1	927140 AC1-208 TAP 314628 3DARLING T DP 1 115/115-B	DVP - DVP	3SCOT NK-3SAMS HD 115 kV line	314603	314602	1	DC	91.78	104.32	ER	134	16.86	
14	N-1	DVP_P1-2: LN 1001	DVP - DVP	3DARLINGT DP-3ROAN DP 115 kV line	314628	314598	1	DC	80.23	103.99	ER	165	39.3	
15	N-1	DVP_P1-2: LN 1001	DVP - DVP	AC1-208 TAP-3DARLINGT DP 115 kV line	927140	314628	1	DC	83.5	107.25	ER	165	39.3	

Multiple Facility Contingency

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

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
16	LFFB	DVP_P4-2: 12342	DVP - DVP	3SO JUSTICE-AC1-208 TAP 115 kV line	313858	927140	1	DC	91.47	121.3	LD	202	60.27	3
17	LFFB	DVP_P4-2: 8042	DVP - DVP	3SO JUSTICE-AC1-208 TAP 115 kV line	313858	927140	1	DC	91.47	121.3	LD	202	60.27	
18	LFFB	DVP_P4-2: 8142	DVP - DVP	6EARLEYS 230/115 kV transformer	314568	314569	1	DC	99.73	116.98	LD	208	35.87	
19	LFFB	DVP_P4-2: 8142	DVP - DVP	6EARLEYS 230/115 kV transformer	314568	314569	2	DC	90.45	106.19	LD	228	35.87	
20	LFFB	DVP_P4-2: 24682	DVP - DVP	6S HERTFORD-6WINFALL 230 kV line	314662	314651	1	DC	82.99	84.27	LD	897	11.5	4
21	LFFB	DVP_P4-2: 24682	DVP - DVP	Z1-036 TAP-6S HERTFORD 230 kV line	916040	314662	1	DC	87.09	88.37	LD	897	11.5	5
22	LFFB	DVP_P4-2: 8142	DVP - DVP	AC1-098 TAP-3SCOT NK 115 kV line	926200	314603	1	DC	87.43	110.58	LD	406	93.99	6
23	LFFB	DVP_P4-2: 254T2141	DVP - DVP	AD1-057 TAP-3SO JUSTICE 115 kV line	934330	313858	1	DC	84.18	105.55	LD	202	45.5	7

Short Circuit

(Summary of impacted circuit breakers)

New circuit breakers found to be over-duty:

None

Contributions to previously identified circuit breakers found to be over-duty:

None

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)

	Contingency		Affected		Bus			Power	Loading %		Rating		MW	
#	Type	Name	Area	Facility Description	From	To	Cir.	Flow	Initial	Final	Type	MVA	Contribution	Ref
24	LFFB	DVP_P4-2: 5602	DVP - DVP	3CHESTNUT-3WITAKRS 115 kV line	313719	314623	1	DC	184.21	217.68		174	58.24	8
25	LFFB	DVP_P4-2: 2202	DVP - DVP	3CHESTNUT-3WITAKRS 115 kV line	313719	314623	1	DC	176.91	210.39		174	58.25	
26	LFFB	DVP_P4-2: 13002	DVP - DVP	3CHESTNUT-3WITAKRS 115 kV line	313719	314623	1	DC	176.28	209.75		174	58.25	
27	LFFB	DVP_P4-2: 5402	DVP - DVP	3CHESTNUT-3WITAKRS 115 kV line	313719	314623	1	DC	176.16	209.64		174	58.25	
28	N-1	DVP_P1-2: LN 2056	DVP - DVP	3CHESTNUT-3WITAKRS 115 kV line	313719	314623	1	DC	160.27	183.48	ER	134	31.2	
29	N-1	DVP_P1-2: LN 126	DVP - DVP	3CHESTNUT-3WITAKRS 115 kV line	313719	314623	1	DC	150.18	177.99	ER	134	37.38	
30	Non	Non	DVP - DVP	3CHESTNUT-3WITAKRS 115 kV line	313719	314623	1	DC	130.18	155.98	NR	123	31.77	
31	DCTL	DVP_P7-1: LN 81-2056	DVP - CPLE	6MORNSTR-6ROCKYMT230T 230 kV line	313845	304222	1	DC	139.51	144.38	ER	374	18.14	9
32	N-1	DVP_P1-2: LN 2181	DVP - CPLE	6MORNSTR-6ROCKYMT230T 230 kV line	313845	304222	1	DC	100.39	103.23	ER	374	10.64	

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
33	LFFB	DVP_P4-2: 562T563	DVP - DVP	6CARSON-6CHRL249 230 kV line	314282	314285	1	DC	111.37	111.87		684	7.97	10
34	LFFB	DVP_P4-2: 562T563	DVP - DVP	6CHRL249-6LOCKS 230 kV line	314285	314316	1	DC	108.56	109.06		684	7.97	11
35	DCTL	DVP_P7-1: LN 2058-2181	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	DC	441.97	468.81	ER	93	24.95	12
36	N-1	DVP_P1-2: LN 1014	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	DC	149.2	177.57	ER	93	26.38	
37	N-1	DVP_P1-3: 3MORNSTR-6MORNSTR	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	DC	136.59	152.53	ER	93	14.82	
38	Non	Non	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	DC	110.32	122.86	NR	93	11.66	
39	LFFB	DVP_P4-2: 12342	DVP - DVP	6CAROLNA 230/115 kV transformer	314559	314561	1	DC	122.37	131.96		289	27.64	13
40	LFFB	DVP_P4-2: 246T2034	DVP - DVP	6CLUBHSE-AD1-034 TAP 230 kV line	314563	934070	1	DC	127.76	130.89		637	21.79	14
41	LFFB	DVP_P4-2: 24662	DVP - DVP	6CLUBHSE-AD1-034 TAP 230 kV line	314563	934070	1	DC	119.14	122.27		637	19.8	
42	LFFB	DVP_P4-2: 2012TH4	DVP - DVP	6EARLEYS 230/115 kV transformer	314568	314569	1	DC	127.6	134.38		208	14.11	15

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
43	LFFB	DVP_P4-2: 201262	DVP - DVP	6EARLEYS 230/115 kV transformer	314568	314569	2	DC	116.23	122.42		228	14.11	16
44	DCTL	DVP_P7-1: LN 2058-2181	DVP - CPLE	6EVERETS-6GREENVILE T 230 kV line	314574	304451	1	DC	118.89	119.79	ER	478	9.5	17
45	LFFB	DVP_P4-2: 5602	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	148.86	181.07		174	58.26	18
46	LFFB	DVP_P4-2: 2202	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	141.52	173.73		174	58.27	
47	LFFB	DVP_P4-2: 13002	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	140.89	173.1		174	58.27	
48	LFFB	DVP_P4-2: 5402	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	140.77	172.99		174	58.27	
49	LFFB	DVP_P4-5: T122C	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	130.61	169.45		174	68.47	
50	N-1	DVP_P1-2: LN 2056	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	126.12	149.35	ER	134	31.22	
51	N-1	DVP_P1-2: LN 1015-B	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	115.29	143.11	ER	134	37.4	
52	LFFB	DVP_P4-2: 8042	DVP - DVP	3HORNRTN-3CAROLNA 115 kV line	314578	314559	1	DC	118.33	148.16		202	60.27	19
53	LFFB	DVP_P4-2: 12342	DVP - DVP	3HORNRTN-3CAROLNA 115 kV line	314578	314559	1	DC	118.33	148.16		202	60.27	
54	LFFB	DVP_P4-2: 8142	DVP - DVP	3KELFORD-3EARLEYS 115 kV line	314582	314568	1	DC	223.7	277.41		175	93.99	20

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
55	LFFB	DVP_P4-2: 246T247	DVP - DVP	6LAKEVEW-AB2-100 TAP 230 kV line	314583	924510	1	DC	113.81	117.3		459	16.01	21
56	LFFB	DVP_P4-2: 12342	DVP - DVP	3ROAN DP-3HORNRTN 115 kV line	314598	314578	1	DC	114.34	144.18		202	60.27	22
57	LFFB	DVP_P4-2: 8042	DVP - DVP	3ROAN DP-3HORNRTN 115 kV line	314598	314578	1	DC	114.29	144.13		202	60.27	
58	LFFB	DVP_P4-2: 8142	DVP - DVP	3SAMS HD-3KELFORD 115 kV line	314602	314582	1	DC	215.03	269.05		174	93.99	23
59	LFFB	DVP_P4-2: 8142	DVP - DVP	3SCOT NK-3SAMS HD 115 kV line	314603	314602	1	DC	216.18	270.2		174	93.99	24
60	LFFB	DVP_P4-2: 5602	DVP - DVP	3WITAKRS-3BTLEBRO 115 kV line	314623	314554	1	DC	186.55	220.01		174	58.23	25
61	LFFB	DVP_P4-2: 2202	DVP - DVP	3WITAKRS-3BTLEBRO 115 kV line	314623	314554	1	DC	179.22	212.69		174	58.24	
62	LFFB	DVP_P4-2: 13002	DVP - DVP	3WITAKRS-3BTLEBRO 115 kV line	314623	314554	1	DC	178.59	212.06		174	58.24	
63	LFFB	DVP_P4-2: 5402	DVP - DVP	3WITAKRS-3BTLEBRO 115 kV line	314623	314554	1	DC	178.48	211.95		174	58.24	
64	N-1	DVP_P1-2: LN 2056	DVP - DVP	3WITAKRS-3BTLEBRO 115 kV line	314623	314554	1	DC	161.08	184.29	ER	134	31.2	
65	N-1	DVP_P1-2: LN 126	DVP - DVP	3WITAKRS-3BTLEBRO 115 kV line	314623	314554	1	DC	151.06	178.87	ER	134	37.38	
66	Non	Non	DVP - DVP	3WITAKRS-3BTLEBRO 115 kV line	314623	314554	1	DC	131.07	156.87	NR	123	31.77	

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
67	LFFB	DVP_P4-2: 12342	DVP - DVP	3DARLINGT DP-3ROAN DP 115 kV line	314628	314598	1	DC	117.41	147.24		202	60.27	26
68	LFFB	DVP_P4-2: 8042	DVP - DVP	3DARLINGT DP-3ROAN DP 115 kV line	314628	314598	1	DC	117.41	147.24		202	60.27	
69	LFFB	DVP_P4-2: 246T247	DVP - DVP	6ELIZ CT-6SHAWBRO 230 kV line	314638	314647	1	DC	114.72	116.15		699	9.99	27
70	LFFB	DVP_P4-2: 246T247	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	122.52	126.01		459	16.01	28
71	LFFB	DVP_P4-2: 24682	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	120.28	123.7		459	15.66	
72	N-1	DVP_P1-2: LN 246	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	104.15	106.87	ER	375	10.18	
73	N-1	DVP_P1-2: LN 130-A	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	103.65	106.41	ER	375	10.34	
74	LFFB	DVP_P4-2: 12342	DVP - DVP	AC1-208 TAP-3DARLINGT DP 115 kV line	927140	314628	1	DC	120.13	149.97		202	60.27	29
75	LFFB	DVP_P4-2: 8042	DVP - DVP	AC1-208 TAP-3DARLINGT DP 115 kV line	927140	314628	1	DC	120.08	149.92		202	60.27	
76	LFFB	DVP_P4-2: 246T2034	DVP - DVP	AD1-034 TAP-6SAPONY 230 kV line	934070	314435	1	DC	136.11	139.34		637	21.79	30
77	LFFB	DVP_P4-2: 5602	DVP - DVP	AD1-057 TAP-3COX DP 115 kV line	934330	314577	1	DC	133.52	161.26		202	58.26	31

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution	Ref
78	LFFB	DVP_P4-2: 2202	DVP - DVP	AD1-057 TAP-3COX DP 115 kV line	934330	314577	1	DC	127.2	154.95		202	58.27	
79	LFFB	DVP_P4-2: 13002	DVP - DVP	AD1-057 TAP-3COX DP 115 kV line	934330	314577	1	DC	126.66	154.41		202	58.27	
80	LFFB	DVP_P4-2: 5402	DVP - DVP	AD1-057 TAP-3COX DP 115 kV line	934330	314577	1	DC	126.56	154.31		202	58.27	
81	LFFB	DVP_P4-5: T122C	DVP - DVP	AD1-057 TAP-3COX DP 115 kV line	934330	314577	1	DC	117.8	151.26		202	68.47	
82	N-1	DVP_P1-2: LN 2056	DVP - DVP	AD1-057 TAP-3COX DP 115 kV line	934330	314577	1	DC	108.94	127.81	ER	165	31.22	
83	N-1	DVP_P1-2: LN 1015-B	DVP - DVP	AD1-057 TAP-3COX DP 115 kV line	934330	314577	1	DC	100.14	122.75	ER	165	37.4	
84	LFFB	AEP_P4_#7589_05J.FERR 765	AEP - AEP	05EDAN 1-05DANVL2 138 kV line	242631	242620	1	DC	109.49	110.17	ER	415	6.28	32
72	N-1	DVP_P1-2: LN 246	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	104.15	106.87	ER	375	10.18	
73	N-1	DVP_P1-2: LN 130-A	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	103.65	106.41	ER	375	10.34	
74	LFFB	DVP_P4-2: 12342	DVP - DVP	AC1-208 TAP-3DARLINGT DP 115 kV line	927140	314628	1	DC	120.13	149.97		202	60.27	29
75	LFFB	DVP_P4-2: 8042	DVP - DVP	AC1-208 TAP-3DARLINGT DP 115 kV line	927140	314628	1	DC	120.08	149.92		202	60.27	

Steady-State Voltage Requirements

(Summary of the VAR requirements based upon the results of the steady-state voltage studies)

To be determined during Impact Study

Stability and Reactive Power Requirement for Low Voltage Ride Through

(Summary of the VAR requirements based upon the results of the dynamic studies)

To be determined during Impact Study

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 IC 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.

	Contingency		Affected		Bus			Power	Loading %		Rating		MW
#	Type	Name	Area	Facility Description	From	To	Cir.	Flow	Initial	Final	Type	MVA	Contribution
85	N-1	927140 AC1-208 TAP 314628 3DARLING T DP 1 115/115-B	DVP - DVP	3CHESTNUT-3WITAKRS 115 kV line	313719	314623	1	DC	209.95	260.62	ER	134	68.11
86	Non	Non	DVP - DVP	3CHESTNUT-3WITAKRS 115 kV line	313719	314623	1	DC	181.3	220.72	NR	123	48.72

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution
87	N-1	DVP_P1-2: LN 2181	DVP - CPLE	6MORNSTR-6ROCKYMT230T 230 kV line	313845	304222	1	DC	139.62	143.99	ER	374	16.32
88	N-1	DVP_P1-2: LN 2058	DVP - DVP	6MORNSTR-6NASH 230 kV line	313845	314591	1	DC	123.65	127.36	ER	449	16.64
89	N-1	DVP_P1-2: LN 1001	DVP - DVP	3SO JUSTICE-AC1-208 TAP 115 kV line	313858	927140	1	DC	109.74	146.17	ER	165	60.27
90	N-1	DVP_P1-2: LN 246	DVP - DVP	6MACKEYS-6EDENTON 230 kV line	314203	314637	1	DC	79.73	81.3	ER	731	11.56
91	N-1	DVP_P1-2: LN 563	DVP - DVP	6CARSON-6CHRL249 230 kV line	314282	314285	1	DC	101.19	101.69	ER	559	7.44
92	N-1	DVP_P1-2: LN 563	DVP - DVP	6CHRL249-6LOCKS 230 kV line	314285	314316	1	DC	97.77	98.27	ER	559	7.44
93	N-1	DVP_P1-2: LN 563	DVP - DVP	6CHESTF B-6BASIN 230 kV line	314287	314276	1	DC	151.19	151.75	ER	449	5.53
94	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6SAPONY-6CARSON 230 kV line	314435	314282	1	DC	124.72	127.37	ER	679	17.96
95	Non	Non	DVP - DVP	6SAPONY-6CARSON 230 kV line	314435	314282	1	DC	100.6	103.07	NR	679	16.8
96	N-1	DVP_P1-2: LN 1014	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	DC	210.89	252.87	ER	93	40.45
97	Non	Non	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	DC	158.83	178.06	NR	93	17.88

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution
98	N-1	DVP_P1-2: LN 123	DVP - DVP	3BTLEBRO-3MORNSTR 115 kV line	314554	313844	1	DC	85.22	103.88	ER	246	45.96
99	N-1	DVP_P1-2: LN 1001	DVP - DVP	6CAROLNA 230/115 kV transformer	314559	314561	1	DC	146.94	158.48	ER	240	27.68
100	Non	Non	DVP - DVP	6CAROLNA 230/115 kV transformer	314559	314561	1	DC	108.58	110.75	NR	227	10.88
101	N-1	DVP_P1-2: LN 238-A	DVP - DVP	6CAROLNA-6ROA VAL 230 kV line	314561	314599	1	DC	102.38	103.12	ER	548	9
102	N-1	DVP_P1-2: LN 246	DVP - DVP	6CLUBHSE-AD1-034 TAP 230 kV line	314563	934070	1	DC	126.61	129.92	ER	599	19.74
103	Non	Non	DVP - DVP	6CLUBHSE-AD1-034 TAP 230 kV line	314563	934070	1	DC	109.54	112.36	NR	599	16.81
104	N-1	DVP_P1-3: 3EARLEYS - 6EARLEYS A	DVP - DVP	6EARLEYS 230/115 kV transformer	314568	314569	1	DC	117.98	125.52	ER	176	13.25
105	N-1	DVP_P1-3: 3EARLEYS - 6EARLEYS	DVP - DVP	6EARLEYS 230/115 kV transformer	314568	314569	2	DC	105.81	112.59	ER	196	13.25
106	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6EARLEYS-6NUCO TP 230 kV line	314569	314575	1	DC	138.31	141.22	ER	572	17
107	Non	Non	DVP - DVP	6EARLEYS-6NUCO TP 230 kV line	314569	314575	1	DC	86.12	88.53	NR	572	13.78

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution
108	N-1	DVP_P1-2: LN 2131	DVP - CPLE	6EVERETS-6GREENVILE T 230 kV line	314574	304451	1	DC	83.56	84.13	ER	478	6.1
109	N-1	DVP_P1-2: LN 2131A	DVP - DVP	6NUCO TP-6SUFFOLK 230 kV line	314575	314537	1	DC	132.28	135.19	ER	572	17
110	N-1	927140 AC1-208 TAP 314628 3DARLING T DP 1 115/115-B	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	160.08	210.62	ER	134	68.13
111	Non	Non	DVP - DVP	3COX DP-3CHESTNUT 115 kV line	314577	313719	1	DC	132.64	172.05	NR	123	48.74
112	N-1	DVP_P1-2: LN 1001	DVP - DVP	3HORNRTN-3CAROLNA 115 kV line	314578	314559	1	DC	142.54	178.97	ER	165	60.27
113	N-1	DVP_P1-2: LN 1001	DVP - DVP	3KELFORD-3EARLEYS 115 kV line	314582	314568	1	DC	152.54	176.12	ER	143	33.69
114	Non	Non	DVP - DVP	3KELFORD-3EARLEYS 115 kV line	314582	314568	1	DC	107.34	118.7	NR	143	16.24
115	N-1	DVP_P1-2: LN 246	DVP - DVP	6LAKEVEW-AB2-100 TAP 230 kV line	314583	924510	1	DC	131.64	135.81	ER	375	15.61
116	Non	Non	DVP - DVP	6LAKEVEW-AB2-100 TAP 230 kV line	314583	924510	1	DC	104.3	107.75	NR	375	12.87
117	N-1	DVP_P1-2: LN 2058	DVP - CPLE	6NASH-6PA-RMOUNT#4 230 kV line	314591	304226	1	DC	113.21	116.75	ER	470	16.64
118	N-1	DVP_P1-2: LN 1001	DVP - DVP	3ROAN DP-3HORNRTN 115 kV line	314598	314578	1	DC	137.61	174.04	ER	165	60.27

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution
119	N-1	DVP_P1-2: LN 238-A	DVP - DVP	6ROA VAL-6NORTHAMPTON 230 kV line	314599	314266	1	DC	102.32	103.06	ER	548	9
120	N-1	DVP_P1-2: LN 1001	DVP - DVP	3SAMS HD-3KELFORD 115 kV line	314602	314582	1	DC	152.38	177.45	ER	134	33.7
121	Non	Non	DVP - DVP	3SAMS HD-3KELFORD 115 kV line	314602	314582	1	DC	114.55	127.74	NR	123	16.25
122	N-1	DVP_P1-2: LN 1001	DVP - DVP	3SCOT NK-3SAMS HD 115 kV line	314603	314602	1	DC	153.87	178.94	ER	134	33.7
123	Non	Non	DVP - DVP	3SCOT NK-3SAMS HD 115 kV line	314603	314602	1	DC	116.18	129.37	NR	123	16.25
124	N-1	927140 AC1-208 TAP 314628 3DARLINGT DP 1 115/115-B	DVP - DVP	3WITAKRS-3BTLEBRO 115 kV line	314623	314554	1	DC	213.18	263.84	ER	134	68.1
125	Non	Non	DVP - DVP	3WITAKRS-3BTLEBRO 115 kV line	314623	314554	1	DC	181.76	220.02	NR	123	48.71
126	N-1	DVP_P1-2: LN 1001	DVP - DVP	3DARLINGT DP-3ROAN DP 115 kV line	314628	314598	1	DC	141.41	177.84	ER	165	60.27
127	N-1	DVP_P1-2: LN 246	DVP - DVP	6EDENTON-Z1-036 TAP 230 kV line	314637	916040	1	DC	76.33	77.9	ER	733	11.56
128	N-1	DVP_P1-2: LN 246	DVP - DVP	6S HERTFORD-6WINFALL 230 kV line	314662	314651	1	DC	101.2	102.77	ER	733	11.54

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution
129	N-1	DVP_P1-2: LN 246	DVP - DVP	Z1-036 TAP-6S HERTFORD 230 kV line	916040	314662	1	DC	106.23	107.8	ER	733	11.54
130	N-1	DVP_P1-2: LN 246	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	147.27	151.44	ER	375	15.61
131	Non	Non	DVP - DVP	AB2-100 TAP-6CLUBHSE 230 kV line	924510	314563	1	DC	116.66	120.11	NR	375	12.87
132	N-1	DVP_P1-2: LN 1001	DVP - DVP	AC1-208 TAP-3DARLINGT DP 115 kV line	927140	314628	1	DC	144.68	181.11	ER	165	60.27
133	Non	Non	DVP - DVP	AC1-208 TAP-3DARLINGT DP 115 kV line	927140	314628	1	DC	83.37	100.91	NR	165	29.01
134	N-1	DVP_P1-2: LN 246	DVP - DVP	AD1-034 TAP-6SAPONY 230 kV line	934070	314435	1	DC	135.62	138.93	ER	599	19.74
135	Non	Non	DVP - DVP	AD1-034 TAP-6SAPONY 230 kV line	934070	314435	1	DC	115.44	117.93	NR	599	16.81
136	N-1	DVP_P1-2: LN 2160-A	DVP - DVP	AD1-057 TAP-3SO JUSTICE 115 kV line	934330	313858	1	DC	74.78	102.45	ER	165	45.78
137	N-1	927140 AC1-208 TAP 314628 3DARLINGT DP 1 115/115-B	DVP - DVP	AD1-057 TAP-3COX DP 115 kV line	934330	314577	1	DC	136.53	177.6	ER	165	68.13
138	Non	Non	DVP - DVP	AD1-057 TAP-3COX DP 115 kV line	934330	314577	1	DC	105.19	134.53	NR	165	48.74

#	Contingency Type	Contingency Name	Affected Area	Facility Description	Bus From	Bus To	Cir.	Power Flow	Loading % Initial	Loading % Final	Rating Type	Rating MVA	MW Contribution
139	N-1	AEP_P1-2_#1377	AEP - AEP	05EDAN 1-05DANVL2 138 kV line	242631	242620	1	DC	109.47	110.15	ER	415	6.28
140	Non	Non	AEP - AEP	05EDAN 1-05DANVL2 138 kV line	242631	242620	1	DC	92.55	93.37	NR	275	5.02

Light Load Analysis

Light Load Studies to be conducted during later study phases (as required by PJM Manual 14B).

Affected System Analysis & Mitigation

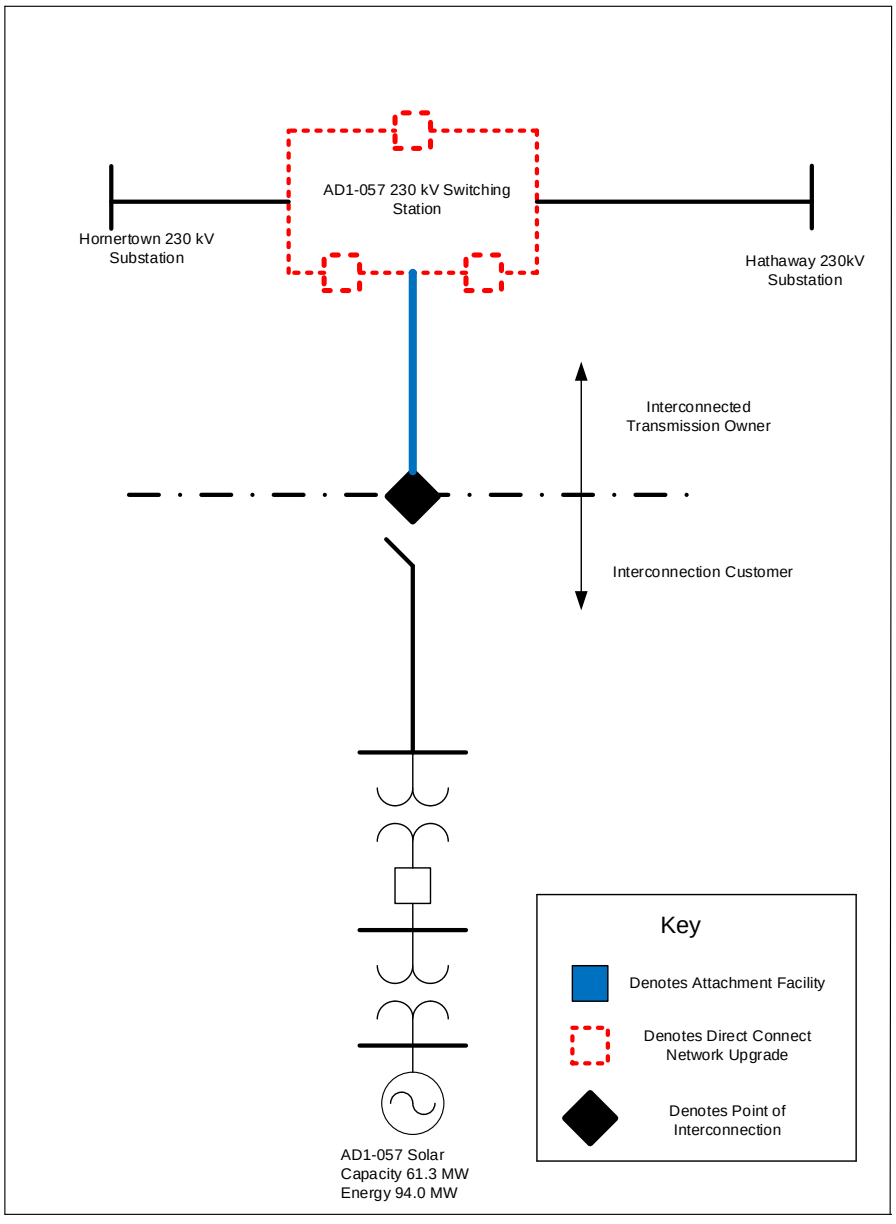
Duke, Progress & TVA Impacts:

Duke Carolina, Progress, & TVA Impacts to be determined during later study phases (as applicable).

Attachment 1.

System Configuration

(OPTION 1)



Appendices

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, 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. All New Service Queue Requests, through the end of the Queue under study, that are contributors to a flowgate will be listed in the Appendices. Please note that there may be contributors that are subsequently queued after the queue under study that are not listed in the Appendices. 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 and appendices sections are full contributions, whereas the loading percentages reported in the body of the report, those contributions take into consideration the commercial probability of each project as well as the ramping impact of "Adder" contributions.

OPTION 1

Appendix 1

(DVP - DVP) The 6MORNSTR-6NASH 230 kV line (from bus 313845 to bus 314591 ckt 1) loads from 89.24% to 93.72% (**DC power flow**) of its emergency rating (449 MVA) for the single line contingency outage of 'DVP_P1-2: LN 2058'. This project contributes approximately 20.13 MW to the thermal violation.

CONTINGENCY 'DVP_P1-2: LN 2058'
OPEN BRANCH FROM BUS 304222 TO BUS 313845 CKT 1 /*
6ROCKYMT230T230.00 - 6MORNSTR 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*1.42*
315292	*1DOMTR78*	*0.96*
315293	*1DOMTR9*	*0.78*
315131	*1EDGECMA*	*25.16*
315132	*1EDGECMB*	*25.16*
315139	*1GASTONA*	*4.12*
315141	*1GASTONB*	*4.12*
315126	*1ROARAP2*	*1.32*
315128	*1ROARAP4*	*1.27*
315136	*1ROSEMG1*	*3.44*
315138	*1ROSEMG2*	*1.61*
315137	*1ROSEMS1*	*2.14*
315115	*1S HAMPT1*	*0.91*
314704	*3LAWRENC*	*0.21*
932631	*AC2-084 C*	*8.57*
933451	*AC2-158 C*	*3.5*
933461	*AC2-159 C*	*5.08*
933711	*AC2-194 C*	*0.35*
933991	*AD1-023 C*	*7.37*
934041	*AD1-029 C*	*10.6*
934201	*AD1-047 C*	*5.87*
934231	*AD1-050 C*	*1.62*
934331	*AD1-057 C O1*	*20.13*
934521	*AD1-076 C O1*	*28.97*
LTF	*AMIL*	*0.39*
LTF	*BAYOU*	*2.04*
LTF	*BIG_CAJUN1*	*3.21*
LTF	*BIG_CAJUN2*	*6.46*
LTF	*BLUEG*	*2.05*
LTF	*CALDERWOOD*	*1.2*
LTF	*CANNELTON*	*0.39*

LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*1.18*
LTF	*CELEVELAND*	*3.34*
LTF	*CHEOAH*	*1.12*
LTF	*CHILHOWEE*	*0.39*
LTF	*CHOCTAW*	*2.19*
LTF	*CLIFTY*	*7.53*
LTF	*COTTONWOOD*	*7.98*
LTF	*DEARBORN*	*0.75*
LTF	*EDWARDS*	*0.63*
LTF	*ELMERSMITH*	*1.14*
LTF	*FARMERCITY*	*0.49*
LTF	*G-007A*	*0.78*
LTF	*GIBSON*	*0.72*
LTF	*HAMLET*	*4.66*
LTF	*MORGAN*	*3.53*
LTF	*NEWTON*	*1.73*
LTF	*O-066A*	*0.36*
LTF	*PRAIRIE*	*3.73*
LTF	*ROWAN*	*2.47*
LTF	*SANTEETLA*	*0.33*
LTF	*SMITHLAND*	*0.33*
LTF	*TATANKA*	*0.84*
LTF	*TILTON*	*0.75*
LTF	*TRIMBLE*	*0.39*
LTF	*TVA*	*1.49*
LTF	*UNIONPOWER*	*2.14*
900671	*V4-068 C*	*0.07*
LTF	*VFT*	*2.08*
901081	*W1-029C*	*0.41*
LTF	*X1-078*	*0.6*
913391	*Y1-086 C*	*0.08*
916041	*Z1-036 C*	*0.48*
917121	*Z2-027 C*	*0.14*
917331	*Z2-043 C*	*0.37*
917341	*Z2-044 C*	*0.33*
917511	*Z2-088 C OP1*	*1.7*
917591	*Z2-099 C*	*0.12*
918411	*AA1-050*	*1.43*
918491	*AA1-063AC OP*	*1.22*
918511	*AA1-065 C OP*	*1.18*
918531	*AA1-067 C*	*0.25*
918561	*AA1-072 C*	*0.06*
919691	*AA2-053 C*	*1.35*
919701	*AA2-057 C*	*1.62*

919731	*AA2-059 C*	*0.09*
919821	*AA2-068 C*	*0.46*
920021	*AA2-086 C*	*0.06*
920041	*AA2-088 C*	*0.75*
920591	*AA2-165 C*	*0.22*
920631	*AA2-169 C*	*1.08*
920671	*AA2-174 C*	*0.06*
920691	*AA2-178 C*	*4.42*
930051	*AB1-013 C*	*1.33*
930401	*AB1-081 C*	*14.54*
930861	*AB1-132 C*	*16.04*
931231	*AB1-173 C*	*1.65*
931241	*AB1-173AC*	*1.65*
923801	*AB2-015 C O1*	*4.12*
923851	*AB2-025 C*	*0.2*
923911	*AB2-031 C O1*	*1.64*
923941	*AB2-035 C*	*0.68*
923991	*AB2-040 C O1*	*5.38*
924151	*AB2-059 C O1*	*17.13*
924381	*AB2-087 C*	*0.4*
924391	*AB2-088 C*	*0.88*
924401	*AB2-089 C*	*0.73*
924491	*AB2-098 C*	*0.43*
924501	*AB2-099 C*	*0.41*
924511	*AB2-100 C*	*8.55*
925121	*AB2-169 C*	*4.09*
925171	*AB2-174 C O1*	*5.02*
925281	*AB2-186 C*	*0.21*
925291	*AB2-188 C O1*	*1.09*
925591	*AC1-034 C*	*13.94*
925781	*AC1-054 C*	*2.86*
926071	*AC1-086 C*	*23.63*
926201	*AC1-098 C*	*6.01*
926211	*AC1-099 C*	*2.01*
926771	*AC1-163 C*	*1.34*
927021	*AC1-189 C*	*12.37*
927111	*AC1-206 C*	*6.91*
927141	*AC1-208 C*	*8.88*

Appendix 2

(DVP - DVP) The 6EARLEYS-6NUCO TP 230 kV line (from bus 314569 to bus 314575 ckt 1) loads from 84.78% to 86.56% (**DC power flow**) of its emergency rating (572 MVA) for the single line contingency outage of 'DVP_P1-2: LN 2131A'. This project contributes approximately 10.19 MW to the thermal violation.

CONTINGENCY 'DVP_P1-2: LN 2131A'
OPEN BRANCH FROM BUS 314662 TO BUS 916040 CKT 1 /* 6S HERTFORD 230.00 - Z1-036 TAP 230.00
OPEN BRANCH FROM BUS 314651 TO BUS 314662 CKT 1 /* 6WINFALL 230.00 - 6S HERTFORD 230.00
OPEN BUS 314662 /* ISLAND
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*4.77*
315292	*1DOMTR78*	*3.23*
315293	*1DOMTR9*	*2.63*
315131	*1EDGECMA*	*9.02*
315132	*1EDGECMB*	*9.02*
315139	*1GASTONA*	*3.89*
315141	*1GASTONB*	*3.89*
315159	*1KERR 2*	*0.85*
315163	*1KERR 6*	*0.84*
315164	*1KERR 7*	*0.84*
315126	*1ROARAP2*	*1.58*
315128	*1ROARAP4*	*1.52*
315136	*1ROSEMG1*	*2.75*
315138	*1ROSEMG2*	*1.29*
315137	*1ROSEMS1*	*1.7*
314704	*3LAWRENC*	*0.23*
932631	*AC2-084 C*	*11.32*
933451	*AC2-158 C*	*12.21*
933461	*AC2-159 C*	*9.55*
933991	*AD1-023 C*	*27.83*
934041	*AD1-029 C*	*14.*
934201	*AD1-047 C*	*6.39*
934231	*AD1-050 C*	*2.75*
934331	*AD1-057 C O1*	*10.19*
934521	*AD1-076 C O1*	*112.89*
LTF	*AD1-120*	*4.28*
LTF	*AD1-121*	*4.25*
LTF	*CARR*	*0.09*
LTF	*CBM-S1*	*5.29*
LTF	*CBM-S2*	*10.69*

LTF	*CBM-W1*	*11.82*
LTF	*CBM-W2*	*28.65*
LTF	*CIN*	*2.65*
LTF	*CPLE*	*3.68*
LTF	*IPL*	*1.69*
LTF	*LGEE*	*0.57*
LTF	*MEC*	*5.94*
LTF	*MECS*	*2.71*
LTF	*RENSSELAER*	*0.07*
LTF	*ROSETON*	*0.5*
900671	*V4-068 C*	*0.11*
LTF	*WEC*	*0.73*
916041	*Z1-036 C*	*2.69*
917331	*Z2-043 C*	*0.76*
917341	*Z2-044 C*	*0.27*
917511	*Z2-088 C OP1*	*1.21*
917591	*Z2-099 C*	*0.13*
918411	*AA1-050*	*1.02*
918491	*AA1-063AC OP*	*1.44*
918511	*AA1-065 C OP*	*4.02*
918531	*AA1-067 C*	*0.52*
918561	*AA1-072 C*	*0.11*
919691	*AA2-053 C*	*2.02*
919701	*AA2-057 C*	*1.49*
919731	*AA2-059 C*	*0.47*
919821	*AA2-068 C*	*0.5*
LTF	*AA2-074*	*2.51*
920021	*AA2-086 C*	*0.07*
920041	*AA2-088 C*	*0.83*
920591	*AA2-165 C*	*0.2*
920631	*AA2-169 C*	*1.56*
920671	*AA2-174 C*	*0.09*
920691	*AA2-178 C*	*19.71*
930051	*AB1-013 C*	*5.95*
930401	*AB1-081 C*	*8.64*
930861	*AB1-132 C*	*15.15*
931231	*AB1-173 C*	*1.8*
931241	*AB1-173AC*	*1.8*
923911	*AB2-031 C O1*	*1.78*
923941	*AB2-035 C*	*0.4*
923991	*AB2-040 C O1*	*5.86*
924151	*AB2-059 C O1*	*10.18*
924381	*AB2-087 C*	*1.08*
924391	*AB2-088 C*	*0.51*
924401	*AB2-089 C*	*1.25*

924491	*AB2-098 C*	*0.88*
924501	*AB2-099 C*	*0.99*
924511	*AB2-100 C*	*7.31*
925121	*AB2-169 C*	*11.96*
925171	*AB2-174 C O1*	*5.33*
925291	*AB2-188 C O1*	*4.86*
925591	*AC1-034 C*	*8.09*
925781	*AC1-054 C*	*4.54*
926071	*AC1-086 C*	*22.31*
926201	*AC1-098 C*	*7.94*
926211	*AC1-099 C*	*2.66*
926771	*AC1-163 C*	*3.28*
927021	*AC1-189 C*	*11.67*
927111	*AC1-206 C*	*5.79*
927141	*AC1-208 C*	*9.96*

Appendix 3

(DVP - DVP) The 6NUCO TP-6SUFFOLK 230 kV line (from bus 314575 to bus 314537 ckt 1) loads from 78.76% to 80.55% (**DC power flow**) of its emergency rating (572 MVA) for the single line contingency outage of 'DVP_P1-2: LN 2131A'. This project contributes approximately 10.19 MW to the thermal violation.

CONTINGENCY 'DVP_P1-2: LN 2131A'
OPEN BRANCH FROM BUS 314662 TO BUS 916040 CKT 1 /* 6S HERTFORD 230.00 - Z1-036 TAP 230.00
OPEN BRANCH FROM BUS 314651 TO BUS 314662 CKT 1 /* 6WINFALL 230.00 - 6S HERTFORD 230.00
OPEN BUS 314662 /* ISLAND
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*4.77*
315292	*1DOMTR78*	*3.23*
315293	*1DOMTR9*	*2.63*
315131	*1EDGECMA*	*9.02*
315132	*1EDGECMB*	*9.02*
315139	*1GASTONA*	*3.89*
315141	*1GASTONB*	*3.89*
315159	*1KERR 2*	*0.85*
315163	*1KERR 6*	*0.84*
315164	*1KERR 7*	*0.84*
315126	*1ROARAP2*	*1.58*
315128	*1ROARAP4*	*1.52*
315136	*1ROSEMG1*	*2.75*
315138	*1ROSEMG2*	*1.29*
315137	*1ROSEMS1*	*1.7*
314704	*3LAWRENC*	*0.23*
932631	*AC2-084 C*	*11.32*
933451	*AC2-158 C*	*12.21*
933461	*AC2-159 C*	*9.55*
933991	*AD1-023 C*	*27.83*
934041	*AD1-029 C*	*14.*
934201	*AD1-047 C*	*6.39*
934231	*AD1-050 C*	*2.75*
934331	*AD1-057 C O1*	*10.19*
934521	*AD1-076 C O1*	*112.89*
LTF	*AD1-120*	*4.28*
LTF	*AD1-121*	*4.25*
LTF	*CARR*	*0.09*
LTF	*CBM-S1*	*5.29*
LTF	*CBM-S2*	*10.69*

LTF	*CBM-W1*	*11.82*
LTF	*CBM-W2*	*28.65*
LTF	*CIN*	*2.65*
LTF	*CPLE*	*3.68*
LTF	*IPL*	*1.69*
LTF	*LGEE*	*0.57*
LTF	*MEC*	*5.94*
LTF	*MECS*	*2.71*
LTF	*RENSSELAER*	*0.07*
LTF	*ROSETON*	*0.5*
900671	*V4-068 C*	*0.11*
LTF	*WEC*	*0.73*
916041	*Z1-036 C*	*2.69*
917331	*Z2-043 C*	*0.76*
917341	*Z2-044 C*	*0.27*
917511	*Z2-088 C OP1*	*1.21*
917591	*Z2-099 C*	*0.13*
918411	*AA1-050*	*1.02*
918491	*AA1-063AC OP*	*1.44*
918511	*AA1-065 C OP*	*4.02*
918531	*AA1-067 C*	*0.52*
918561	*AA1-072 C*	*0.11*
919691	*AA2-053 C*	*2.02*
919701	*AA2-057 C*	*1.49*
919731	*AA2-059 C*	*0.47*
919821	*AA2-068 C*	*0.5*
LTF	*AA2-074*	*2.51*
920021	*AA2-086 C*	*0.07*
920041	*AA2-088 C*	*0.83*
920591	*AA2-165 C*	*0.2*
920631	*AA2-169 C*	*1.56*
920671	*AA2-174 C*	*0.09*
920691	*AA2-178 C*	*19.71*
930051	*AB1-013 C*	*5.95*
930401	*AB1-081 C*	*8.64*
930861	*AB1-132 C*	*15.15*
931231	*AB1-173 C*	*1.8*
931241	*AB1-173AC*	*1.8*
923911	*AB2-031 C O1*	*1.78*
923941	*AB2-035 C*	*0.4*
923991	*AB2-040 C O1*	*5.86*
924151	*AB2-059 C O1*	*10.18*
924381	*AB2-087 C*	*1.08*
924391	*AB2-088 C*	*0.51*
924401	*AB2-089 C*	*1.25*

924491	*AB2-098 C*	*0.88*
924501	*AB2-099 C*	*0.99*
924511	*AB2-100 C*	*7.31*
925121	*AB2-169 C*	*11.96*
925171	*AB2-174 C O1*	*5.33*
925291	*AB2-188 C O1*	*4.86*
925591	*AC1-034 C*	*8.09*
925781	*AC1-054 C*	*4.54*
926071	*AC1-086 C*	*22.31*
926201	*AC1-098 C*	*7.94*
926211	*AC1-099 C*	*2.66*
926771	*AC1-163 C*	*3.28*
927021	*AC1-189 C*	*11.67*
927111	*AC1-206 C*	*5.79*
927141	*AC1-208 C*	*9.96*

Appendix 4

(DVP - DVP) The 6LAKEVEW-AB2-100 TAP 230 kV line (from bus 314583 to bus 924510 ckt 1) loads from 92.81% to 97.05% (**DC power flow**) of its emergency rating (375 MVA) for the single line contingency outage of 'DVP_P1-2: LN 246'. This project contributes approximately 15.83 MW to the thermal violation.

CONTINGENCY 'DVP_P1-2: LN 246'
OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* 6SUFFOLK 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00
OPEN BUS 314575 /* ISLAND
OPEN BUS 314590 /* ISLAND
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*1.91*
315292	*1DOMTR78*	*1.29*
315293	*1DOMTR9*	*1.06*
315131	*1EDGECMA*	*10.25*
315132	*1EDGECMB*	*10.25*
315139	*1GASTONA*	*7.85*
315141	*1GASTONB*	*7.85*
315159	*1KERR 2*	*0.55*
315163	*1KERR 6*	*0.55*
315164	*1KERR 7*	*0.55*
315126	*1ROARAP2*	*1.59*
315128	*1ROARAP4*	*1.53*
315136	*1ROSEMG1*	*5.27*
315138	*1ROSEMG2*	*2.47*
315137	*1ROSEMS1*	*3.27*
315115	*1S HAMPT1*	*0.87*
932631	*AC2-084 C*	*9.07*
933451	*AC2-158 C*	*5.83*
933461	*AC2-159 C*	*6.88*
933991	*AD1-023 C*	*10.79*
934041	*AD1-029 C*	*11.22*
934231	*AD1-050 C*	*2.06*
934331	*AD1-057 C O1*	*15.83*
934521	*AD1-076 C O1*	*40.*
LTF	*AD1-120*	*3.64*
LTF	*AD1-121*	*3.61*
LTF	*CARR*	*0.09*

LTF	*CBM-S1*	*4.38*
LTF	*CBM-S2*	*9.*
LTF	*CBM-W1*	*9.53*
LTF	*CBM-W2*	*23.61*
LTF	*CIN*	*2.14*
LTF	*CPLE*	*3.08*
LTF	*IPL*	*1.36*
LTF	*LGEE*	*0.46*
LTF	*MEC*	*4.84*
LTF	*MECS*	*2.14*
LTF	*RENSSELAER*	*0.07*
LTF	*ROSETON*	*0.53*
900671	*V4-068 C*	*0.08*
LTF	*WEC*	*0.59*
916041	*Z1-036 C*	*0.44*
917331	*Z2-043 C*	*0.48*
917341	*Z2-044 C*	*0.27*
917511	*Z2-088 C OP1*	*0.99*
917591	*Z2-099 C*	*0.13*
918411	*AA1-050*	*0.84*
918491	*AA1-063AC OP*	*1.43*
918511	*AA1-065 C OP*	*2.04*
918531	*AA1-067 C*	*0.32*
918561	*AA1-072 C*	*0.07*
919691	*AA2-053 C*	*1.72*
919701	*AA2-057 C*	*1.43*
919731	*AA2-059 C*	*0.09*
919821	*AA2-068 C*	*0.45*
LTF	*AA2-074*	*2.1*
920021	*AA2-086 C*	*0.07*
920041	*AA2-088 C*	*0.82*
920591	*AA2-165 C*	*0.19*
920631	*AA2-169 C*	*1.34*
920671	*AA2-174 C*	*0.08*
920691	*AA2-178 C*	*5.4*
930051	*AB1-013 C*	*1.63*
930401	*AB1-081 C*	*9.31*
930861	*AB1-132 C*	*30.54*
923801	*AB2-015 C O1*	*3.7*
923941	*AB2-035 C*	*0.36*
924151	*AB2-059 C O1*	*10.97*
924381	*AB2-087 C*	*0.61*
924391	*AB2-088 C*	*0.46*
924401	*AB2-089 C*	*0.94*
924491	*AB2-098 C*	*0.54*

924501	*AB2-099 C*	*0.59*
925121	*AB2-169 C*	*5.4*
925291	*AB2-188 C O1*	*1.33*
925591	*AC1-034 C*	*7.23*
925781	*AC1-054 C*	*3.61*
926071	*AC1-086 C*	*44.98*
926201	*AC1-098 C*	*6.36*
926211	*AC1-099 C*	*2.13*
926771	*AC1-163 C*	*1.96*
927021	*AC1-189 C*	*8.69*
927141	*AC1-208 C*	*9.18*

Appendix 5

(DVP - DVP) The 6SAPONY-6CARSON 230 kV line (from bus 314435 to bus 314282 ckt 1) loads from 95.73% to 98.43% (**DC power flow**) of its load dump rating (830 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 2020T2144'. This project contributes approximately 22.31 MW to the thermal violation.

```
CONTINGENCY 'DVP_P4-2: 2020T2144'                    /* WINFALL 230 KV
  OPEN BRANCH FROM BUS 313851 TO BUS 314638 CKT 1          /* 6ECITYDP2
230.00 - 6ELIZ CT 230.00
  OPEN BRANCH FROM BUS 313851 TO BUS 314639 CKT 1          /* 6ECITYDP2
230.00 - 6TANGLEW 230.00
  OPEN BRANCH FROM BUS 314639 TO BUS 314651 CKT 1          /* 6TANGLEW
230.00 - 6WINFALL 230.00
  OPEN BUS 313851                          /* ISLAND: 6ECITYDP2 230.00
  OPEN BUS 314639                          /* ISLAND: 6TANGLEW 230.00
  OPEN BUS 913391                          /* ISLAND: Y1-086 C 230.00
  OPEN BUS 913392                          /* ISLAND: Y1-086 E 230.00
  OPEN BUS 917121                          /* ISLAND: Z2-027 C 230.00
  OPEN BUS 917122                          /* ISLAND: Z2-027 E 230.00
  OPEN BRANCH FROM BUS 314651 TO BUS 901080 CKT 1          /* 6WINFALL
230.00 - W1-029 230.00
  END
```

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*9.72*
315132	*1EDGECMB*	*9.72*
315139	*1GASTONA*	*7.07*
315141	*1GASTONB*	*7.07*
315126	*1ROARAP2*	*2.51*
315128	*1ROARAP4*	*2.41*
315136	*1ROSEMG1*	*4.76*
315138	*1ROSEMG2*	*2.23*
315137	*1ROSEMS1*	*2.95*
314557	*3BETHELC*	*0.79*
314554	*3BTLEBRO*	*0.82*
314566	*3CRESWEL*	*2.18*
314572	*3EMPORIA*	*1.*
314578	*3HORNRTN*	*4.97*
314582	*3KELFORD*	*0.9*
314704	*3LAWRENC*	*0.79*
314603	*3SCOT NK*	*3.76*
314617	*3TUNIS*	*0.84*
314541	*3WATKINS*	*0.46*
314620	*6CASHIE*	*0.79*
314574	*6EVERETS*	*2.14*

314594	*6PLYMOTH*	*0.78*
314651	*6WINFALL*	*1.56*
932631	*AC2-084 C*	*10.32*
932632	*AC2-084 E*	*5.08*
933451	*AC2-158 C*	*5.16*
933452	*AC2-158 E*	*5.16*
933461	*AC2-159 C*	*8.61*
933462	*AC2-159 E*	*8.61*
933711	*AC2-194 C*	*0.97*
933712	*AC2-194 E*	*1.56*
933991	*AD1-023 C*	*12.16*
933992	*AD1-023 E*	*6.62*
934041	*AD1-029 C*	*12.76*
934042	*AD1-029 E*	*8.41*
934201	*AD1-047 C*	*16.72*
934202	*AD1-047 E*	*11.15*
934231	*AD1-050 C*	*4.72*
934232	*AD1-050 E*	*2.58*
934331	*AD1-057 C O1*	*14.55*
934332	*AD1-057 E O1*	*7.76*
934521	*AD1-076 C O1*	*49.94*
934522	*AD1-076 E O1*	*25.43*
LTF	*AD1-120*	*3.93*
LTF	*AD1-121*	*3.91*
LTF	*CARR*	*0.11*
LTF	*CBM-S1*	*4.8*
LTF	*CBM-S2*	*9.64*
LTF	*CBM-W1*	*10.58*
LTF	*CBM-W2*	*25.91*
LTF	*CIN*	*2.38*
LTF	*CPLE*	*3.25*
LTF	*G-007*	*0.7*
LTF	*IPL*	*1.52*
LTF	*LGEE*	*0.51*
LTF	*MEC*	*5.35*
LTF	*MECS*	*2.38*
LTF	*O-066*	*2.34*
LTF	*RENSSELAER*	*0.09*
LTF	*ROSETON*	*0.65*
900671	*V4-068 C*	*0.1*
900672	*V4-068 E*	*0.29*
LTF	*WEC*	*0.65*
916041	*Z1-036 C*	*1.19*
916042	*Z1-036 E*	*40.68*
917331	*Z2-043 C*	*0.5*

917332	*Z2-043 E*	*1.08*
917341	*Z2-044 C*	*0.29*
917342	*Z2-044 E*	*0.62*
917511	*Z2-088 C OP1*	*0.93*
917512	*Z2-088 E OP1*	*3.73*
917591	*Z2-099 C*	*0.18*
917592	*Z2-099 E*	*0.41*
918411	*AA1-050*	*0.78*
918491	*AA1-063AC OP*	*2.17*
918492	*AA1-063AE OP*	*5.21*
918511	*AA1-065 C OP*	*1.68*
918512	*AA1-065 E OP*	*4.22*
918532	*AA1-067 E*	*0.64*
918561	*AA1-072 C*	*0.07*
918562	*AA1-072 E*	*0.18*
919691	*AA2-053 C*	*2.45*
919692	*AA2-053 E*	*5.36*
919701	*AA2-057 C*	*1.58*
919702	*AA2-057 E*	*4.03*
919731	*AA2-059 C*	*0.21*
919732	*AA2-059 E*	*0.5*
919821	*AA2-068 C*	*0.53*
919822	*AA2-068 E*	*1.24*
LTF	*AA2-074*	*2.21*
920021	*AA2-086 C*	*0.1*
920022	*AA2-086 E*	*0.22*
920041	*AA2-088 C*	*1.14*
920042	*AA2-088 E*	*9.49*
920591	*AA2-165 C*	*0.22*
920592	*AA2-165 E*	*0.53*
920631	*AA2-169 C*	*2.6*
920632	*AA2-169 E*	*1.19*
920671	*AA2-174 C*	*0.11*
920672	*AA2-174 E*	*0.62*
920691	*AA2-178 C*	*8.72*
920692	*AA2-178 E*	*3.74*
930051	*AB1-013 C*	*2.63*
930052	*AB1-013 E*	*17.61*
930401	*AB1-081 C*	*9.2*
930402	*AB1-081 E*	*3.94*
930861	*AB1-132 C*	*27.5*
930862	*AB1-132 E*	*11.79*
931231	*AB1-173 C*	*4.7*
931232	*AB1-173 E*	*2.19*
931241	*AB1-173AC*	*4.7*

931242	*AB1-173AE*	*2.19*
923851	*AB2-025 C*	*2.01*
923852	*AB2-025 E*	*4.59*
923911	*AB2-031 C O1*	*4.67*
923912	*AB2-031 E O1*	*2.3*
923941	*AB2-035 C*	*0.33*
923942	*AB2-035 E*	*0.14*
923991	*AB2-040 C O1*	*15.33*
923992	*AB2-040 E O1*	*12.54*
924021	*AB2-043 C O1*	*2.52*
924022	*AB2-043 E O1*	*4.14*
924151	*AB2-059 C O1*	*10.84*
924152	*AB2-059 E O1*	*5.58*
924161	*AB2-060 C O1*	*7.16*
924162	*AB2-060 E O1*	*3.37*
924301	*AB2-077 C O1*	*1.58*
924302	*AB2-077 E O1*	*1.05*
924311	*AB2-078 C O1*	*1.58*
924312	*AB2-078 E O1*	*1.05*
924321	*AB2-079 C O1*	*1.58*
924322	*AB2-079 E O1*	*1.05*
924381	*AB2-087 C*	*0.59*
924382	*AB2-087 E*	*0.28*
924391	*AB2-088 C*	*0.43*
924392	*AB2-088 E*	*0.21*
924401	*AB2-089 C*	*2.14*
924402	*AB2-089 E*	*1.1*
924411	*AB2-090 C*	*3.18*
924412	*AB2-090 E*	*1.63*
924491	*AB2-098 C*	*0.5*
924492	*AB2-098 E*	*0.21*
924501	*AB2-099 C*	*0.6*
924502	*AB2-099 E*	*0.26*
924511	*AB2-100 C*	*34.93*
924512	*AB2-100 E*	*17.2*
925121	*AB2-169 C*	*5.84*
925122	*AB2-169 E*	*5.24*
925171	*AB2-174 C O1*	*15.46*
925172	*AB2-174 E O1*	*13.98*
925221	*AB2-176 C*	*1.31*
925222	*AB2-176 E*	*0.56*
925281	*AB2-186 C*	*0.54*
925282	*AB2-186 E*	*0.23*
925291	*AB2-188 C O1*	*2.15*
925292	*AB2-188 E O1*	*0.97*

925591	*AC1-034 C*	*6.79*
925592	*AC1-034 E*	*5.13*
925781	*AC1-054 C*	*7.68*
925782	*AC1-054 E*	*3.54*
926071	*AC1-086 C*	*40.5*
926072	*AC1-086 E*	*18.43*
926201	*AC1-098 C*	*7.24*
926202	*AC1-098 E*	*4.31*
926211	*AC1-099 C*	*2.43*
926212	*AC1-099 E*	*1.42*
926771	*AC1-163 C*	*1.96*
926772	*AC1-163 E*	*0.92*
927021	*AC1-189 C*	*8.08*
927022	*AC1-189 E*	*4.02*
927111	*AC1-206 C*	*31.48*
927112	*AC1-206 E*	*14.88*
927141	*AC1-208 C*	*11.81*
927142	*AC1-208 E*	*5.25*

Appendix 6

(DVP - DVP) The 6S HERTFORD-6WINFALL 230 kV line (from bus 314662 to bus 314651 ckt 1) loads from 82.99% to 84.18% (**DC power flow**) of its load dump rating (897 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 24682'. This project contributes approximately 10.74 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 24682' /* 24682 @ SUFFOLK
OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* SUFFOLK - NUCOR TAP
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* NUCOR TAP - EARLEYS
OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* SUFFOLK 230-115 TX#5
OPEN BRANCH FROM BUS 314928 TO BUS 314537 CKT 2 /* SUFFOLK 500-230 TX#8
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*5.68*
315292	*1DOMTR78*	*3.84*
315293	*1DOMTR9*	*3.13*
315132	*1EDGECMB*	*6.42*
315139	*1GASTONA*	*2.57*
315141	*1GASTONB*	*2.57*
315136	*1ROSEMG1*	*1.83*
315138	*1ROSEMG2*	*0.86*
315137	*1ROSEMS1*	*1.14*
314557	*3BETHELC*	*0.69*
314566	*3CRESWEL*	*7.79*
314582	*3KELFORD*	*0.9*
314603	*3SCOT NK*	*3.1*
314617	*3TUNIS*	*0.8*
314620	*6CASHIE*	*1.83*
314574	*6EVERETS*	*2.87*
314594	*6PLYMOTH*	*2.34*
932631	*AC2-084 C*	*7.52*
932632	*AC2-084 E*	*3.7*
933451	*AC2-158 C*	*9.34*
933452	*AC2-158 E*	*9.34*
933461	*AC2-159 C*	*6.2*
933462	*AC2-159 E*	*6.2*
933991	*AD1-023 C*	*31.82*
933992	*AD1-023 E*	*17.32*
934041	*AD1-029 C*	*9.3*
934042	*AD1-029 E*	*6.13*

934331	*AD1-057 C O1*	*7.*
934332	*AD1-057 E O1*	*3.74*
934521	*AD1-076 C O1*	*145.11*
934522	*AD1-076 E O1*	*73.89*
LTF	*CARR*	*0.06*
LTF	*CBM-S1*	*3.81*
LTF	*CBM-S2*	*7.76*
LTF	*CBM-W1*	*8.48*
LTF	*CBM-W2*	*20.64*
LTF	*CIN*	*1.9*
LTF	*CPLE*	*2.68*
LTF	*G-007*	*0.47*
LTF	*IPL*	*1.21*
LTF	*LGEE*	*0.41*
LTF	*MEC*	*4.27*
LTF	*MECS*	*1.94*
LTF	*O-066*	*1.55*
LTF	*RENSSELAER*	*0.05*
LTF	*ROSETON*	*0.38*
900671	*V4-068 C*	*0.07*
900672	*V4-068 E*	*0.21*
LTF	*WEC*	*0.52*
916041	*Z1-036 C*	*5.35*
916042	*Z1-036 E*	*182.46*
917331	*Z2-043 C*	*0.49*
917332	*Z2-043 E*	*1.08*
917341	*Z2-044 C*	*0.19*
917342	*Z2-044 E*	*0.41*
917511	*Z2-088 C OP1*	*0.89*
917512	*Z2-088 E OP1*	*3.58*
918411	*AA1-050*	*0.75*
918511	*AA1-065 C OP*	*2.57*
918512	*AA1-065 E OP*	*6.44*
918531	*AA1-067 C*	*0.39*
918532	*AA1-067 E*	*0.86*
918561	*AA1-072 C*	*0.07*
918562	*AA1-072 E*	*0.18*
919691	*AA2-053 C*	*1.32*
919692	*AA2-053 E*	*2.9*
919701	*AA2-057 C*	*1.02*
919702	*AA2-057 E*	*2.6*
919731	*AA2-059 C*	*0.9*
919732	*AA2-059 E*	*2.15*
919821	*AA2-068 C*	*0.34*
919822	*AA2-068 E*	*0.79*

LTF	*AA2-074*	*1.83*
920591	*AA2-165 C*	*0.14*
920592	*AA2-165 E*	*0.34*
920671	*AA2-174 C*	*0.06*
920672	*AA2-174 E*	*0.33*
920691	*AA2-178 C*	*31.15*
920692	*AA2-178 E*	*13.35*
930051	*AB1-013 C*	*9.4*
930052	*AB1-013 E*	*62.92*
930861	*AB1-132 C*	*10.01*
930862	*AB1-132 E*	*4.29*
923941	*AB2-035 C*	*0.29*
923942	*AB2-035 E*	*0.12*
924381	*AB2-087 C*	*0.69*
924382	*AB2-087 E*	*0.33*
924391	*AB2-088 C*	*0.37*
924392	*AB2-088 E*	*0.18*
924491	*AB2-098 C*	*0.67*
924492	*AB2-098 E*	*0.29*
924501	*AB2-099 C*	*0.64*
924502	*AB2-099 E*	*0.27*
925121	*AB2-169 C*	*13.01*
925122	*AB2-169 E*	*11.67*
925281	*AB2-186 C*	*2.54*
925282	*AB2-186 E*	*1.09*
925291	*AB2-188 C O1*	*7.68*
925292	*AB2-188 E O1*	*3.45*
925591	*AC1-034 C*	*5.93*
925592	*AC1-034 E*	*4.47*
926071	*AC1-086 C*	*14.73*
926072	*AC1-086 E*	*6.71*
926201	*AC1-098 C*	*5.27*
926202	*AC1-098 E*	*3.14*
926211	*AC1-099 C*	*1.77*
926212	*AC1-099 E*	*1.04*
926771	*AC1-163 C*	*2.11*
926772	*AC1-163 E*	*0.99*
927021	*AC1-189 C*	*8.71*
927022	*AC1-189 E*	*4.34*
927141	*AC1-208 C*	*6.67*
927142	*AC1-208 E*	*2.96*

Appendix 7

(DVP - DVP) The Z1-036 TAP-6S HERTFORD 230 kV line (from bus 916040 to bus 314662 ckt 1) loads from 87.08% to 88.28% (**DC power flow**) of its load dump rating (897 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 24682'. This project contributes approximately 10.74 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 24682' /* 24682 @ SUFFOLK
OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* SUFFOLK - NUCOR TAP
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* NUCOR TAP - EARLEYS
OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* SUFFOLK 230-115 TX#5
OPEN BRANCH FROM BUS 314928 TO BUS 314537 CKT 2 /* SUFFOLK 500-230 TX#8
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*5.68*
315292	*1DOMTR78*	*3.84*
315293	*1DOMTR9*	*3.13*
315131	*1EDGECMA*	*6.42*
315132	*1EDGECMB*	*6.42*
315139	*1GASTONA*	*2.57*
315141	*1GASTONB*	*2.57*
315136	*1ROSEMG1*	*1.83*
315138	*1ROSEMG2*	*0.86*
315137	*1ROSEMS1*	*1.14*
314557	*3BETHELC*	*0.69*
314554	*3BTLEBRO*	*0.54*
314566	*3CRESWEL*	*7.79*
314578	*3HORNRTN*	*2.19*
314582	*3KELFORD*	*0.9*
314603	*3SCOT NK*	*3.1*
314617	*3TUNIS*	*0.8*
314620	*6CASHIE*	*1.83*
314574	*6EVERETS*	*2.87*
314594	*6PLYMOTH*	*2.34*
932631	*AC2-084 C*	*7.52*
932632	*AC2-084 E*	*3.7*
933451	*AC2-158 C*	*9.34*
933452	*AC2-158 E*	*9.34*
933461	*AC2-159 C*	*6.2*
933462	*AC2-159 E*	*6.2*
933991	*AD1-023 C*	*31.82*

933992	*AD1-023 E*	*17.32*
934041	*AD1-029 C*	*9.3*
934042	*AD1-029 E*	*6.13*
934331	*AD1-057 C O1*	*7.*
934332	*AD1-057 E O1*	*3.74*
934521	*AD1-076 C O1*	*145.11*
934522	*AD1-076 E O1*	*73.89*
LTF	*CARR*	*0.06*
LTF	*CBM-S1*	*3.81*
LTF	*CBM-S2*	*7.76*
LTF	*CBM-W1*	*8.48*
LTF	*CBM-W2*	*20.64*
LTF	*CIN*	*1.9*
LTF	*CPLE*	*2.68*
LTF	*G-007*	*0.47*
LTF	*IPL*	*1.21*
LTF	*LGEE*	*0.41*
LTF	*MEC*	*4.27*
LTF	*MECS*	*1.94*
LTF	*O-066*	*1.55*
LTF	*RENSSELAER*	*0.05*
LTF	*ROSETON*	*0.38*
900671	*V4-068 C*	*0.07*
900672	*V4-068 E*	*0.21*
LTF	*WEC*	*0.52*
916041	*Z1-036 C*	*5.35*
916042	*Z1-036 E*	*182.46*
917331	*Z2-043 C*	*0.49*
917332	*Z2-043 E*	*1.08*
917341	*Z2-044 C*	*0.19*
917342	*Z2-044 E*	*0.41*
917511	*Z2-088 C OP1*	*0.89*
917512	*Z2-088 E OP1*	*3.58*
918411	*AA1-050*	*0.75*
918511	*AA1-065 C OP*	*2.57*
918512	*AA1-065 E OP*	*6.44*
918531	*AA1-067 C*	*0.39*
918532	*AA1-067 E*	*0.86*
918561	*AA1-072 C*	*0.07*
918562	*AA1-072 E*	*0.18*
919691	*AA2-053 C*	*1.32*
919692	*AA2-053 E*	*2.9*
919701	*AA2-057 C*	*1.02*
919702	*AA2-057 E*	*2.6*
919731	*AA2-059 C*	*0.9*

919732	*AA2-059 E*	*2.15*
919821	*AA2-068 C*	*0.34*
919822	*AA2-068 E*	*0.79*
LTF	*AA2-074*	*1.83*
920591	*AA2-165 C*	*0.14*
920592	*AA2-165 E*	*0.34*
920671	*AA2-174 C*	*0.06*
920672	*AA2-174 E*	*0.33*
920691	*AA2-178 C*	*31.15*
920692	*AA2-178 E*	*13.35*
930051	*AB1-013 C*	*9.4*
930052	*AB1-013 E*	*62.92*
930401	*AB1-081 C*	*6.09*
930402	*AB1-081 E*	*2.61*
930861	*AB1-132 C*	*10.01*
930862	*AB1-132 E*	*4.29*
923941	*AB2-035 C*	*0.29*
923942	*AB2-035 E*	*0.12*
924151	*AB2-059 C O1*	*7.18*
924152	*AB2-059 E O1*	*3.7*
924381	*AB2-087 C*	*0.69*
924382	*AB2-087 E*	*0.33*
924391	*AB2-088 C*	*0.37*
924392	*AB2-088 E*	*0.18*
924491	*AB2-098 C*	*0.67*
924492	*AB2-098 E*	*0.29*
924501	*AB2-099 C*	*0.64*
924502	*AB2-099 E*	*0.27*
925121	*AB2-169 C*	*13.01*
925122	*AB2-169 E*	*11.67*
925291	*AB2-188 C O1*	*7.68*
925292	*AB2-188 E O1*	*3.45*
925591	*AC1-034 C*	*5.93*
925592	*AC1-034 E*	*4.47*
926071	*AC1-086 C*	*14.73*
926072	*AC1-086 E*	*6.71*
926201	*AC1-098 C*	*5.27*
926202	*AC1-098 E*	*3.14*
926211	*AC1-099 C*	*1.77*
926212	*AC1-099 E*	*1.04*
926771	*AC1-163 C*	*2.11*
926772	*AC1-163 E*	*0.99*
927021	*AC1-189 C*	*8.71*
927022	*AC1-189 E*	*4.34*
927141	*AC1-208 C*	*6.67*

927142	*AC1-208 E*	*2.96*

Appendix 8

(DVP - DVP) The 3CHESTNUT-3COX DP 115 kV line (from bus 313719 to bus 314577 ckt 1) loads from 102.75% to 104.75% (**DC power flow**) of its load dump rating (174 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 254T2141'. This project contributes approximately 8.55 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 254T2141' /* LAKEVIEW
OPEN BRANCH FROM BUS 314583 TO BUS 314561 CKT 1 /* 2141
OPEN BRANCH FROM BUS 314583 TO BUS 924510 CKT 1 /* 254
END

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*5.26*
315132	*1EDGECMB*	*5.26*
314554	*3BTLEBRO*	*0.87*
934043	*AD1-029 BAT*	*42.11*
934331	*AD1-057 C O1*	*5.57*
934332	*AD1-057 E O1*	*2.97*
LTF	*CARR*	*0.01*
LTF	*CBM-S1*	*1.77*
LTF	*CBM-S2*	*3.47*
LTF	*CBM-W1*	*4.06*
LTF	*CBM-W2*	*9.61*
LTF	*CIN*	*0.91*
LTF	*CPLE*	*1.16*
LTF	*G-007*	*0.15*
LTF	*IPL*	*0.58*
LTF	*LGEE*	*0.19*
LTF	*MEC*	*2.01*
LTF	*MECS*	*0.96*
LTF	*O-066*	*0.49*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.07*
LTF	*WEC*	*0.25*
917341	*Z2-044 C*	*0.47*
917342	*Z2-044 E*	*1.03*
919701	*AA2-057 C*	*3.41*
919702	*AA2-057 E*	*8.68*
920591	*AA2-165 C*	*0.46*
920592	*AA2-165 E*	*1.14*
930401	*AB1-081 C*	*8.77*
930402	*AB1-081 E*	*3.76*
930861	*AB1-132 C*	*7.64*
930862	*AB1-132 E*	*3.27*
924151	*AB2-059 C O1*	*10.34*

924152	*AB2-059 E O1*	*5.33*
926071	*AC1-086 C*	*11.25*
926072	*AC1-086 E*	*5.12*

Appendix 9

(DVP - DVP) The 3CHESTNUT-3WITAKRS 115 kV line (from bus 313719 to bus 314623 ckt 1) loads from 160.27% to 162.91% (**DC power flow**) of its emergency rating (134 MVA) for the single line contingency outage of 'DVP_P1-2: LN 2056-A'. This project contributes approximately 3.54 MW to the thermal violation.

CONTINGENCY 'DVP_P1-2: LN 2056-A'
OPEN BRANCH FROM BUS 313845 TO BUS 934330 CKT 1 /* 6HATHAWAY 230.00 - AD1-057 TAP 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315139	*1GASTONA*	*1.25*
315141	*1GASTONB*	*1.25*
315126	*1ROARAP2*	*1.08*
315128	*1ROARAP4*	*1.03*
315136	*1ROSEMG1*	*0.9*
315138	*1ROSEMG2*	*0.42*
315137	*1ROSEMS1*	*0.56*
315115	*1S HAMPT1*	*0.61*
932631	*AC2-084 C*	*20.11*
933461	*AC2-159 C*	*3.85*
934041	*AD1-029 C*	*24.87*
934201	*AD1-047 C*	*3.86*
934331	*AD1-057 C O1*	*3.54*
LTF	*AMIL*	*0.15*
LTF	*BAYOU*	*0.79*
LTF	*BIG_CAJUN1*	*1.24*
LTF	*BIG_CAJUN2*	*2.5*
LTF	*BLUEG*	*0.78*
LTF	*CALDERWOOD*	*0.46*
LTF	*CANNELTON*	*0.15*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*0.45*
LTF	*CELEVELAND*	*1.28*
LTF	*CHEOAH*	*0.43*
LTF	*CHILHOWEE*	*0.15*
LTF	*CHOCTAW*	*0.85*
LTF	*CLIFTY*	*2.86*
LTF	*COTTONWOOD*	*3.09*
LTF	*DEARBORN*	*0.29*
LTF	*EDWARDS*	*0.24*
LTF	*ELMERSMITH*	*0.44*
LTF	*FARMERCITY*	*0.19*
LTF	*G-007A*	*0.24*

LTF	*GIBSON*	*0.27*
LTF	*HAMLET*	*1.85*
LTF	*MORGAN*	*1.37*
LTF	*NEWTON*	*0.66*
LTF	*O-066A*	*0.11*
LTF	*PRAIRIE*	*1.43*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.03*
LTF	*ROWAN*	*0.93*
LTF	*SANTEETLA*	*0.13*
LTF	*SMITHLAND*	*0.13*
LTF	*TATANKA*	*0.32*
LTF	*TILTON*	*0.29*
LTF	*TRIMBLE*	*0.15*
LTF	*TVA*	*0.58*
LTF	*UNIONPOWER*	*0.82*
900671	*V4-068 C*	*0.05*
LTF	*VFT*	*0.64*
LTF	*X1-078*	*0.19*
917331	*Z2-043 C*	*0.53*
917591	*Z2-099 C*	*0.09*
918491	*AA1-063AC OP*	*0.96*
918561	*AA1-072 C*	*0.08*
919691	*AA2-053 C*	*1.07*
919701	*AA2-057 C*	*5.17*
919821	*AA2-068 C*	*1.19*
920021	*AA2-086 C*	*0.04*
920041	*AA2-088 C*	*0.54*
920591	*AA2-165 C*	*0.71*
920631	*AA2-169 C*	*0.91*
920671	*AA2-174 C*	*0.05*
930861	*AB1-132 C*	*4.85*
931231	*AB1-173 C*	*1.09*
931241	*AB1-173AC*	*1.09*
923801	*AB2-015 C O1*	*2.72*
923911	*AB2-031 C O1*	*1.08*
923991	*AB2-040 C O1*	*3.54*
924381	*AB2-087 C*	*0.28*
924501	*AB2-099 C*	*0.28*
925171	*AB2-174 C O1*	*3.11*
925781	*AC1-054 C*	*2.47*
926071	*AC1-086 C*	*7.15*
926201	*AC1-098 C*	*14.11*
926211	*AC1-099 C*	*4.73*
926771	*AC1-163 C*	*0.93*

927141	*AC1-208 C*	*19.6*

Appendix 10

(DVP - CPLE) The 6MORNSTR-6ROCKYMT230T 230 kV line (from bus 313845 to bus 304222 ckt 1) loads from 138.85% to 146.98% (**DC power flow**) of its emergency rating (374 MVA) for the tower line contingency outage of 'DVP_P7-1: LN 81-2056'. This project contributes approximately 30.33 MW to the thermal violation.

CONTINGENCY 'DVP_P7-1: LN 81-2056'
OPEN BRANCH FROM BUS 314559 TO BUS 314578 CKT 1 /* 3CAROLNA 115.00 - 3HORNRTN 115.00
OPEN BRANCH FROM BUS 314578 TO BUS 314598 CKT 1 /* 3HORNRTN 115.00 - 3ROAN DP 115.00
OPEN BRANCH FROM BUS 314598 TO BUS 314628 CKT 1 /* 3ROAN DP 115.00 - 3DARLINGT DP115.00
OPEN BUS 314578 /* ISLAND: 3HORNRTN 115.00
OPEN BUS 314598 /* ISLAND: 3ROAN DP 115.00
OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00
OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6MORNSTR 230.00 - 6NASH 230.00
OPEN BRANCH FROM BUS 304226 TO BUS 304222 CKT 1 /* 6PA-RMOUNT#4230.00 - 6ROCKYMT230T
OPEN BUS 304226 /* ISLAND
OPEN BUS 314591 /* ISLAND: 6NASH 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*24.8*
315132	*1EDGECMB*	*24.8*
315139	*1GASTONA*	*4.01*
315141	*1GASTONB*	*4.01*
315126	*1ROARAP2*	*1.22*
315128	*1ROARAP4*	*1.18*
315136	*1ROSEMG1*	*3.36*
315138	*1ROSEMG2*	*1.57*
315137	*1ROSEMS1*	*2.09*
314557	*3BETHELC*	*1.61*
314554	*3BTLEBRO*	*1.08*
314566	*3CRESWEL*	*1.09*
314572	*3EMPORIA*	*0.27*
314582	*3KELFORD*	*0.7*
314603	*3SCOT NK*	*3.23*
314617	*3TUNIS*	*0.55*
314541	*3WATKINS*	*0.33*
314620	*6CASHIE*	*0.49*
314574	*6EVERETS*	*1.81*

314594	*6PLYMOTH*	*0.44*
932631	*AC2-084 C*	*9.38*
932632	*AC2-084 E*	*4.62*
933451	*AC2-158 C*	*3.44*
933452	*AC2-158 E*	*3.44*
933461	*AC2-159 C*	*4.87*
933462	*AC2-159 E*	*4.87*
933991	*AD1-023 C*	*7.25*
933992	*AD1-023 E*	*3.95*
934041	*AD1-029 C*	*11.6*
934042	*AD1-029 E*	*7.65*
934201	*AD1-047 C*	*5.53*
934202	*AD1-047 E*	*3.69*
934331	*AD1-057 C O1*	*19.78*
934332	*AD1-057 E O1*	*10.55*
934521	*AD1-076 C O1*	*28.49*
934522	*AD1-076 E O1*	*14.51*
LTF	*AMIL*	*0.38*
LTF	*BAYOU*	*1.98*
LTF	*BIG_CAJUN1*	*3.12*
LTF	*BIG_CAJUN2*	*6.28*
LTF	*BLUEG*	*1.99*
LTF	*CALDERWOOD*	*1.17*
LTF	*CANNELTON*	*0.38*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*1.14*
LTF	*CELEVELAND*	*3.25*
LTF	*CHEOAH*	*1.09*
LTF	*CHILHOWEE*	*0.38*
LTF	*CHOCTAW*	*2.13*
LTF	*CLIFTY*	*7.32*
LTF	*COTTONWOOD*	*7.76*
LTF	*DEARBORN*	*0.72*
LTF	*EDWARDS*	*0.61*
LTF	*ELMERSMITH*	*1.11*
LTF	*FARMERCITY*	*0.48*
LTF	*G-007A*	*0.76*
LTF	*GIBSON*	*0.69*
LTF	*HAMLET*	*4.52*
LTF	*MORGAN*	*3.43*
LTF	*NEWTON*	*1.68*
LTF	*O-066A*	*0.35*
LTF	*PRAIRIE*	*3.62*
LTF	*ROWAN*	*2.4*
LTF	*SANTEETLA*	*0.32*

LTF	*SMITHLAND*	*0.32*
LTF	*TATANKA*	*0.82*
LTF	*TILTON*	*0.73*
LTF	*TRIMBLE*	*0.38*
LTF	*TVA*	*1.45*
LTF	*UNIONPOWER*	*2.08*
900671	*V4-068 C*	*0.07*
900672	*V4-068 E*	*0.18*
LTF	*VFT*	*2.03*
LTF	*X1-078*	*0.59*
917331	*Z2-043 C*	*0.38*
917332	*Z2-043 E*	*0.84*
917341	*Z2-044 C*	*0.34*
917342	*Z2-044 E*	*0.75*
917511	*Z2-088 C OP1*	*1.68*
917512	*Z2-088 E OP1*	*6.74*
917592	*Z2-099 E*	*0.25*
918411	*AA1-050*	*1.41*
918491	*AA1-063AC OP*	*1.14*
918492	*AA1-063AE OP*	*2.74*
918511	*AA1-065 C OP*	*1.16*
918512	*AA1-065 E OP*	*2.92*
918531	*AA1-067 C*	*0.25*
918532	*AA1-067 E*	*0.54*
918561	*AA1-072 C*	*0.06*
918562	*AA1-072 E*	*0.14*
919691	*AA2-053 C*	*1.27*
919692	*AA2-053 E*	*2.78*
919701	*AA2-057 C*	*1.72*
919702	*AA2-057 E*	*4.39*
919821	*AA2-068 C*	*0.51*
919822	*AA2-068 E*	*1.19*
920022	*AA2-086 E*	*0.14*
920042	*AA2-088 E*	*5.93*
920591	*AA2-165 C*	*0.23*
920592	*AA2-165 E*	*0.58*
920671	*AA2-174 C*	*0.06*
920672	*AA2-174 E*	*0.32*
920691	*AA2-178 C*	*4.34*
920692	*AA2-178 E*	*1.86*
930051	*AB1-013 C*	*1.31*
930052	*AB1-013 E*	*8.77*
930401	*AB1-081 C*	*14.55*
930402	*AB1-081 E*	*6.23*
930861	*AB1-132 C*	*15.61*

930862	*AB1-132 E*	*6.69*
931231	*AB1-173 C*	*1.56*
931232	*AB1-173 E*	*0.73*
931241	*AB1-173AC*	*1.56*
931242	*AB1-173AE*	*0.73*
923801	*AB2-015 C O1*	*3.93*
923802	*AB2-015 E O1*	*3.23*
923911	*AB2-031 C O1*	*1.54*
923912	*AB2-031 E O1*	*0.76*
923941	*AB2-035 C*	*0.68*
923942	*AB2-035 E*	*0.29*
923991	*AB2-040 C O1*	*5.07*
923992	*AB2-040 E O1*	*4.15*
924151	*AB2-059 C O1*	*17.14*
924152	*AB2-059 E O1*	*8.83*
924381	*AB2-087 C*	*0.4*
924382	*AB2-087 E*	*0.19*
924391	*AB2-088 C*	*0.87*
924392	*AB2-088 E*	*0.42*
924491	*AB2-098 C*	*0.42*
924492	*AB2-098 E*	*0.18*
924501	*AB2-099 C*	*0.4*
924502	*AB2-099 E*	*0.17*
924511	*AB2-100 C*	*8.29*
924512	*AB2-100 E*	*4.08*
925121	*AB2-169 C*	*4.03*
925122	*AB2-169 E*	*3.62*
925171	*AB2-174 C O1*	*4.74*
925172	*AB2-174 E O1*	*4.29*
925291	*AB2-188 C O1*	*1.07*
925292	*AB2-188 E O1*	*0.48*
925591	*AC1-034 C*	*13.75*
925592	*AC1-034 E*	*10.37*
926071	*AC1-086 C*	*22.99*
926072	*AC1-086 E*	*10.47*
926201	*AC1-098 C*	*6.58*
926202	*AC1-098 E*	*3.92*
926211	*AC1-099 C*	*2.2*
926212	*AC1-099 E*	*1.29*
926771	*AC1-163 C*	*1.32*
926772	*AC1-163 E*	*0.62*
927021	*AC1-189 C*	*12.21*
927022	*AC1-189 E*	*6.08*
927111	*AC1-206 C*	*6.69*
927112	*AC1-206 E*	*3.16*

927141	*AC1-208 C*	*10.44*
927142	*AC1-208 E*	*4.63*

Appendix 11

(DVP - DVP) The 3SO JUSTICE-3COX DP 115 kV line (from bus 313858 to bus 314577 ckt 1) loads from 108.94% to 111.09% (**DC power flow**) of its emergency rating (165 MVA) for the single line contingency outage of 'DVP_P1-2: LN 2056-A'. This project contributes approximately 3.56 MW to the thermal violation.

CONTINGENCY 'DVP_P1-2: LN 2056-A'
OPEN BRANCH FROM BUS 313845 TO BUS 934330 CKT 1 /* 6HATHAWAY 230.00 - AD1-057 TAP 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315139	*1GASTONA*	*1.25*
315141	*1GASTONB*	*1.25*
315126	*1ROARAP2*	*1.08*
315128	*1ROARAP4*	*1.04*
315136	*1ROSEMG1*	*0.9*
315138	*1ROSEMG2*	*0.42*
315137	*1ROSEMS1*	*0.56*
315115	*1S HAMPT1*	*0.62*
932631	*AC2-084 C*	*20.12*
933461	*AC2-159 C*	*3.86*
934041	*AD1-029 C*	*24.89*
934201	*AD1-047 C*	*3.88*
934331	*AD1-057 C O1*	*3.56*
LTF	*AMIL*	*0.14*
LTF	*BAYOU*	*0.76*
LTF	*BIG_CAJUN1*	*1.2*
LTF	*BIG_CAJUN2*	*2.42*
LTF	*BLUEG*	*0.74*
LTF	*CALDERWOOD*	*0.45*
LTF	*CANNELTON*	*0.14*
LTF	*CATAWBA*	*0.44*
LTF	*CBM-N*	*< 0.01*
LTF	*CELEVELAND*	*1.26*
LTF	*CHEOAH*	*0.42*
LTF	*CHILHOWEE*	*0.15*
LTF	*CHOCTAW*	*0.82*
LTF	*CLIFTY*	*2.67*
LTF	*COTTONWOOD*	*2.98*
LTF	*DEARBORN*	*0.26*
LTF	*EDWARDS*	*0.23*
LTF	*ELMERSMITH*	*0.41*
LTF	*FARMERCITY*	*0.18*
LTF	*G-007A*	*0.3*

LTF	*GIBSON*	*0.26*
LTF	*HAMLET*	*1.82*
LTF	*MORGAN*	*1.32*
LTF	*NEWTON*	*0.63*
LTF	*NYISO*	*0.02*
LTF	*O-066A*	*0.14*
LTF	*PRAIRIE*	*1.36*
LTF	*ROWAN*	*0.91*
LTF	*SANTEETLA*	*0.12*
LTF	*SMITHLAND*	*0.12*
LTF	*TATANKA*	*0.31*
LTF	*TILTON*	*0.27*
LTF	*TRIMBLE*	*0.14*
LTF	*TVA*	*0.55*
LTF	*UNIONPOWER*	*0.8*
900671	*V4-068 C*	*0.05*
LTF	*VFT*	*0.81*
LTF	*X1-078*	*0.24*
917331	*Z2-043 C*	*0.53*
917591	*Z2-099 C*	*0.09*
918491	*AA1-063AC OP*	*0.96*
918561	*AA1-072 C*	*0.08*
919691	*AA2-053 C*	*1.07*
919821	*AA2-068 C*	*1.19*
920021	*AA2-086 C*	*0.04*
920041	*AA2-088 C*	*0.54*
920631	*AA2-169 C*	*0.91*
920671	*AA2-174 C*	*0.05*
930861	*AB1-132 C*	*4.88*
931231	*AB1-173 C*	*1.09*
931241	*AB1-173AC*	*1.09*
923801	*AB2-015 C O1*	*2.73*
923911	*AB2-031 C O1*	*1.08*
923991	*AB2-040 C O1*	*3.55*
924381	*AB2-087 C*	*0.28*
924501	*AB2-099 C*	*0.28*
925171	*AB2-174 C O1*	*3.12*
925781	*AC1-054 C*	*2.48*
926071	*AC1-086 C*	*7.18*
926201	*AC1-098 C*	*14.12*
926211	*AC1-099 C*	*4.73*
926771	*AC1-163 C*	*0.93*
927141	*AC1-208 C*	*19.61*

Appendix 12

(DVP - DVP) The 6CARSON-6CHRL249 230 kV line (from bus 314282 to bus 314285 ckt 1) loads from 108.68% to 109.22% (**DC power flow**) of its load dump rating (684 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 562T563'. This project contributes approximately 9.02 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 562T563' /*CARSON
OPEN BRANCH FROM BUS 314902 TO BUS 314923 CKT 1 /*CARSON TO MIDLOTHIAN
OPEN BRANCH FROM BUS 314914 TO BUS 314902 CKT 1 /*CARSON 500.00 - 8SEPTA 500.00
END

Bus Number	*Bus Name*	*Full Contribution*
315105	*1BRUNSWICKS1*	*11.25*
315131	*1EDGECMA*	*4.76*
315132	*1EDGECMB*	*4.76*
315139	*1GASTONA*	*2.46*
315141	*1GASTONB*	*2.46*
315136	*1ROSEMG1*	*1.7*
315138	*1ROSEMG2*	*0.8*
315137	*1ROSEMS1*	*1.06*
315073	*1STONECA*	*-2.58*
314557	*3BETHELC*	*0.39*
314554	*3BTLEBRO*	*0.41*
314572	*3EMPORIA*	*0.33*
314578	*3HORNRTN*	*1.92*
314582	*3KELFORD*	*0.39*
314704	*3LAWRENC*	*0.28*
314603	*3SCOT NK*	*1.62*
314617	*3TUNIS*	*0.36*
314541	*3WATKINS*	*0.24*
314620	*6CASHIE*	*0.31*
314574	*6EVERETS*	*1.06*
932631	*AC2-084 C*	*4.46*
932632	*AC2-084 E*	*2.2*
932701	*AC2-093 C*	*40.57*
932702	*AC2-093 E*	*23.21*
932761	*AC2-100 C*	*2.16*
932762	*AC2-100 E*	*1.05*
933451	*AC2-158 C*	*2.15*
933452	*AC2-158 E*	*2.15*
933461	*AC2-159 C*	*3.44*
933462	*AC2-159 E*	*3.44*
934041	*AD1-029 C*	*5.52*

934042	*AD1-029 E*	*3.64*
934201	*AD1-047 C*	*5.74*
934202	*AD1-047 E*	*3.82*
934231	*AD1-050 C*	*2.37*
934232	*AD1-050 E*	*1.3*
934311	*AD1-055 C*	*1.03*
934312	*AD1-055 E*	*0.27*
934331	*AD1-057 C O1*	*5.88*
934332	*AD1-057 E O1*	*3.14*
934341	*AD1-058 C*	*2.35*
934342	*AD1-058 E*	*0.6*
934611	*AD1-087 C O1*	*3.97*
934612	*AD1-087 E O1*	*1.85*
934621	*AD1-088 C O1*	*5.56*
934622	*AD1-088 E O1*	*2.61*
LTF	*AD1-120*	*5.26*
LTF	*AD1-121*	*5.24*
934911	*AD1-123 C*	*0.45*
934912	*AD1-123 E*	*0.23*
934991	*AD1-131 C*	*0.77*
934992	*AD1-131 E*	*0.51*
935171	*AD1-152 C O1*	*3.68*
935172	*AD1-152 E O1*	*2.45*
935211	*AD1-156 C*	*1.*
935212	*AD1-156 E*	*0.67*
LTF	*CARR*	*0.18*
LTF	*CBM-S1*	*6.32*
LTF	*CBM-S2*	*12.36*
LTF	*CBM-W1*	*13.62*
LTF	*CBM-W2*	*33.97*
LTF	*CIN*	*3.08*
LTF	*CPLE*	*3.87*
LTF	*G-007*	*1.04*
LTF	*IPL*	*1.96*
LTF	*LGEE*	*0.66*
LTF	*MEC*	*6.96*
LTF	*MECS*	*3.01*
LTF	*O-066*	*3.47*
LTF	*RENSSELAER*	*0.14*
LTF	*ROSETON*	*1.04*
292791	*U1-032 E*	*-1.34*
900672	*V4-068 E*	*0.13*
LTF	*WEC*	*0.84*
916301	*Z1-086 C*	*33.*
916302	*Z1-086 E*	*5.26*

917332	*Z2-043 E*	*0.46*
917342	*Z2-044 E*	*0.3*
917512	*Z2-088 E OP1*	*1.84*
917592	*Z2-099 E*	*0.18*
918492	*AA1-063AE OP*	*2.09*
918512	*AA1-065 E OP*	*1.82*
918532	*AA1-067 E*	*0.32*
918562	*AA1-072 E*	*0.08*
919692	*AA2-053 E*	*2.08*
919702	*AA2-057 E*	*1.84*
919822	*AA2-068 E*	*0.54*
LTF	*AA2-074*	*2.63*
920022	*AA2-086 E*	*0.1*
920042	*AA2-088 E*	*4.33*
920592	*AA2-165 E*	*0.24*
920631	*AA2-169 C*	*1.18*
920632	*AA2-169 E*	*0.54*
920672	*AA2-174 E*	*0.24*
930401	*AB1-081 C*	*4.55*
930402	*AB1-081 E*	*1.95*
930861	*AB1-132 C*	*9.57*
930862	*AB1-132 E*	*4.1*
931231	*AB1-173 C*	*1.61*
931232	*AB1-173 E*	*0.75*
931241	*AB1-173AC*	*1.61*
931242	*AB1-173AE*	*0.75*
923851	*AB2-025 C*	*0.57*
923852	*AB2-025 E*	*1.3*
923911	*AB2-031 C O1*	*1.6*
923912	*AB2-031 E O1*	*0.79*
923941	*AB2-035 C*	*0.16*
923942	*AB2-035 E*	*0.07*
923991	*AB2-040 C O1*	*5.26*
923992	*AB2-040 E O1*	*4.3*
924021	*AB2-043 C O1*	*1.43*
924022	*AB2-043 E O1*	*2.34*
924151	*AB2-059 C O1*	*5.37*
924152	*AB2-059 E O1*	*2.76*
924161	*AB2-060 C O1*	*4.07*
924162	*AB2-060 E O1*	*1.92*
924301	*AB2-077 C O1*	*0.91*
924302	*AB2-077 E O1*	*0.6*
924311	*AB2-078 C O1*	*0.91*
924312	*AB2-078 E O1*	*0.6*
924321	*AB2-079 C O1*	*0.91*

924322	*AB2-079 E O1*	*0.6*
924381	*AB2-087 C*	*0.25*
924382	*AB2-087 E*	*0.12*
924391	*AB2-088 C*	*0.21*
924392	*AB2-088 E*	*0.1*
924401	*AB2-089 C*	*1.08*
924402	*AB2-089 E*	*0.55*
924411	*AB2-090 C*	*1.8*
924412	*AB2-090 E*	*0.92*
924491	*AB2-098 C*	*0.25*
924492	*AB2-098 E*	*0.11*
924501	*AB2-099 C*	*0.26*
924502	*AB2-099 E*	*0.11*
924511	*AB2-100 C*	*10.65*
924512	*AB2-100 E*	*5.25*
925121	*AB2-169 C*	*2.45*
925122	*AB2-169 E*	*2.2*
925171	*AB2-174 C O1*	*5.21*
925172	*AB2-174 E O1*	*4.72*
925221	*AB2-176 C*	*0.74*
925222	*AB2-176 E*	*0.32*
925591	*AC1-034 C*	*3.33*
925592	*AC1-034 E*	*2.52*
925611	*AC1-036 C*	*0.37*
925612	*AC1-036 E*	*0.61*
925781	*AC1-054 C*	*3.71*
925782	*AC1-054 E*	*1.71*
926071	*AC1-086 C*	*14.1*
926072	*AC1-086 E*	*6.42*
926201	*AC1-098 C*	*3.13*
926202	*AC1-098 E*	*1.86*
926211	*AC1-099 C*	*1.05*
926212	*AC1-099 E*	*0.62*
926271	*AC1-105 C*	*2.38*
926272	*AC1-105 E*	*1.19*
926771	*AC1-163 C*	*0.84*
926772	*AC1-163 E*	*0.39*
927021	*AC1-189 C*	*3.98*
927022	*AC1-189 E*	*1.98*
927111	*AC1-206 C*	*9.5*
927112	*AC1-206 E*	*4.49*
927141	*AC1-208 C*	*4.92*
927142	*AC1-208 E*	*2.19*
927251	*AC1-221 C*	*0.94*
927252	*AC1-221 E*	*0.94*

927261	*AC1-222 C*	*1.48*
927262	*AC1-222 E*	*1.41*

Appendix 13

(DVP - DVP) The 6CHRL249-6LOCKS 230 kV line (from bus 314285 to bus 314316 ckt 1) loads from 105.87% to 106.41% (**DC power flow**) of its load dump rating (684 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 562T563'. This project contributes approximately 9.02 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 562T563' /*CARSON
OPEN BRANCH FROM BUS 314902 TO BUS 314923 CKT 1 /*CARSON TO MIDLOTHIAN
OPEN BRANCH FROM BUS 314914 TO BUS 314902 CKT 1 /*CARSON 500.00 - 8SEPTA 500.00
END

Bus Number	*Bus Name*	*Full Contribution*
315105	*1BRUNSWICKS1*	*11.25*
315131	*1EDGECMA*	*4.76*
315132	*1EDGECMB*	*4.76*
315139	*1GASTONA*	*2.46*
315141	*1GASTONB*	*2.46*
315136	*1ROSEMG1*	*1.7*
315138	*1ROSEMG2*	*0.8*
315137	*1ROSEMS1*	*1.06*
315073	*1STONECA*	*-2.58*
314557	*3BETHELC*	*0.39*
314554	*3BTLEBRO*	*0.41*
314572	*3EMPORIA*	*0.33*
314578	*3HORNRTN*	*1.92*
314582	*3KELFORD*	*0.39*
314704	*3LAWRENC*	*0.28*
314603	*3SCOT NK*	*1.62*
314617	*3TUNIS*	*0.36*
314541	*3WATKINS*	*0.24*
314620	*6CASHIE*	*0.31*
314574	*6EVERETS*	*1.06*
932631	*AC2-084 C*	*4.46*
932632	*AC2-084 E*	*2.2*
932701	*AC2-093 C*	*40.57*
932702	*AC2-093 E*	*23.21*
932761	*AC2-100 C*	*2.16*
932762	*AC2-100 E*	*1.05*
933451	*AC2-158 C*	*2.15*
933452	*AC2-158 E*	*2.15*
933461	*AC2-159 C*	*3.44*
933462	*AC2-159 E*	*3.44*
934041	*AD1-029 C*	*5.52*

934042	*AD1-029 E*	*3.64*
934201	*AD1-047 C*	*5.74*
934202	*AD1-047 E*	*3.82*
934231	*AD1-050 C*	*2.37*
934232	*AD1-050 E*	*1.3*
934311	*AD1-055 C*	*1.03*
934312	*AD1-055 E*	*0.27*
934331	*AD1-057 C O1*	*5.88*
934332	*AD1-057 E O1*	*3.14*
934341	*AD1-058 C*	*2.35*
934342	*AD1-058 E*	*0.6*
934611	*AD1-087 C O1*	*3.97*
934612	*AD1-087 E O1*	*1.85*
934621	*AD1-088 C O1*	*5.56*
934622	*AD1-088 E O1*	*2.61*
LTF	*AD1-120*	*5.26*
LTF	*AD1-121*	*5.24*
934911	*AD1-123 C*	*0.45*
934912	*AD1-123 E*	*0.23*
934991	*AD1-131 C*	*0.77*
934992	*AD1-131 E*	*0.51*
935171	*AD1-152 C O1*	*3.68*
935172	*AD1-152 E O1*	*2.45*
935211	*AD1-156 C*	*1.*
935212	*AD1-156 E*	*0.67*
LTF	*CARR*	*0.18*
LTF	*CBM-S1*	*6.32*
LTF	*CBM-S2*	*12.36*
LTF	*CBM-W1*	*13.62*
LTF	*CBM-W2*	*33.97*
LTF	*CIN*	*3.08*
LTF	*CPLE*	*3.87*
LTF	*G-007*	*1.04*
LTF	*IPL*	*1.96*
LTF	*LGEE*	*0.66*
LTF	*MEC*	*6.96*
LTF	*MECS*	*3.01*
LTF	*O-066*	*3.47*
LTF	*RENSSELAER*	*0.14*
LTF	*ROSETON*	*1.04*
292791	*U1-032 E*	*-1.34*
900672	*V4-068 E*	*0.13*
LTF	*WEC*	*0.84*
916301	*Z1-086 C*	*33.*
916302	*Z1-086 E*	*5.26*

917332	*Z2-043 E*	*0.46*
917342	*Z2-044 E*	*0.3*
917512	*Z2-088 E OP1*	*1.84*
917592	*Z2-099 E*	*0.18*
918492	*AA1-063AE OP*	*2.09*
918512	*AA1-065 E OP*	*1.82*
918532	*AA1-067 E*	*0.32*
918562	*AA1-072 E*	*0.08*
919692	*AA2-053 E*	*2.08*
919702	*AA2-057 E*	*1.84*
919822	*AA2-068 E*	*0.54*
LTF	*AA2-074*	*2.63*
920022	*AA2-086 E*	*0.1*
920042	*AA2-088 E*	*4.33*
920592	*AA2-165 E*	*0.24*
920631	*AA2-169 C*	*1.18*
920632	*AA2-169 E*	*0.54*
920672	*AA2-174 E*	*0.24*
930401	*AB1-081 C*	*4.55*
930402	*AB1-081 E*	*1.95*
930861	*AB1-132 C*	*9.57*
930862	*AB1-132 E*	*4.1*
931231	*AB1-173 C*	*1.61*
931232	*AB1-173 E*	*0.75*
931241	*AB1-173AC*	*1.61*
931242	*AB1-173AE*	*0.75*
923851	*AB2-025 C*	*0.57*
923852	*AB2-025 E*	*1.3*
923911	*AB2-031 C O1*	*1.6*
923912	*AB2-031 E O1*	*0.79*
923941	*AB2-035 C*	*0.16*
923942	*AB2-035 E*	*0.07*
923991	*AB2-040 C O1*	*5.26*
923992	*AB2-040 E O1*	*4.3*
924021	*AB2-043 C O1*	*1.43*
924022	*AB2-043 E O1*	*2.34*
924151	*AB2-059 C O1*	*5.37*
924152	*AB2-059 E O1*	*2.76*
924161	*AB2-060 C O1*	*4.07*
924162	*AB2-060 E O1*	*1.92*
924301	*AB2-077 C O1*	*0.91*
924302	*AB2-077 E O1*	*0.6*
924311	*AB2-078 C O1*	*0.91*
924312	*AB2-078 E O1*	*0.6*
924321	*AB2-079 C O1*	*0.91*

924322	*AB2-079 E O1*	*0.6*
924381	*AB2-087 C*	*0.25*
924382	*AB2-087 E*	*0.12*
924391	*AB2-088 C*	*0.21*
924392	*AB2-088 E*	*0.1*
924401	*AB2-089 C*	*1.08*
924402	*AB2-089 E*	*0.55*
924411	*AB2-090 C*	*1.8*
924412	*AB2-090 E*	*0.92*
924491	*AB2-098 C*	*0.25*
924492	*AB2-098 E*	*0.11*
924501	*AB2-099 C*	*0.26*
924502	*AB2-099 E*	*0.11*
924511	*AB2-100 C*	*10.65*
924512	*AB2-100 E*	*5.25*
925121	*AB2-169 C*	*2.45*
925122	*AB2-169 E*	*2.2*
925171	*AB2-174 C O1*	*5.21*
925172	*AB2-174 E O1*	*4.72*
925221	*AB2-176 C*	*0.74*
925222	*AB2-176 E*	*0.32*
925591	*AC1-034 C*	*3.33*
925592	*AC1-034 E*	*2.52*
925611	*AC1-036 C*	*0.37*
925612	*AC1-036 E*	*0.61*
925781	*AC1-054 C*	*3.71*
925782	*AC1-054 E*	*1.71*
926071	*AC1-086 C*	*14.1*
926072	*AC1-086 E*	*6.42*
926201	*AC1-098 C*	*3.13*
926202	*AC1-098 E*	*1.86*
926211	*AC1-099 C*	*1.05*
926212	*AC1-099 E*	*0.62*
926271	*AC1-105 C*	*2.38*
926272	*AC1-105 E*	*1.19*
926771	*AC1-163 C*	*0.84*
926772	*AC1-163 E*	*0.39*
927021	*AC1-189 C*	*3.98*
927022	*AC1-189 E*	*1.98*
927111	*AC1-206 C*	*9.5*
927112	*AC1-206 E*	*4.49*
927141	*AC1-208 C*	*4.92*
927142	*AC1-208 E*	*2.19*
927251	*AC1-221 C*	*0.94*
927252	*AC1-221 E*	*0.94*

927261	*AC1-222 C*	*1.48*
927262	*AC1-222 E*	*1.41*

Appendix 14

(DVP - CPLE) The 3BTLEBRO-3ROCKYMT115T 115 kV line (from bus 314554 to bus 304223 ckt 1) loads from 441.93% to 460.23% (**DC power flow**) of its emergency rating (93 MVA) for the tower line contingency outage of 'DVP_P7-1: LN 2058-2181'. This project contributes approximately 17.02 MW to the thermal violation.

CONTINGENCY 'DVP_P7-1: LN 2058-2181'
OPEN BRANCH FROM BUS 304222 TO BUS 313845 CKT 1 /* 6ROCKYMT230T230.00 - 6HATHAWAY 230.00
OPEN BUS 304226 /* ISLAND: 6PA-RMOUNT#4115.00
OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00
OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6HATHAWAY 230.00 - 6NASH 230.00
OPEN BUS 314591 /* ISLAND: 6NASH 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*13.41*
315132	*1EDGECMB*	*13.41*
315139	*1GASTONA*	*2.49*
315141	*1GASTONB*	*2.49*
315126	*1ROARAP2*	*1.04*
315128	*1ROARAP4*	*1.*
315136	*1ROSEMG1*	*2.02*
315138	*1ROSEMG2*	*0.95*
315137	*1ROSEMS1*	*1.25*
314557	*3BETHELC*	*0.88*
314554	*3BTLEBRO*	*1.95*
314572	*3EMPORIA*	*0.2*
314578	*3HORNRTN*	*2.51*
314582	*3KELFORD*	*0.68*
314603	*3SCOT NK*	*3.67*
314617	*3TUNIS*	*0.44*
314574	*6EVERETS*	*1.04*
932631	*AC2-084 C*	*11.33*
932632	*AC2-084 E*	*5.58*
933451	*AC2-158 C*	*2.27*
933452	*AC2-158 E*	*2.27*
933461	*AC2-159 C*	*3.97*
933462	*AC2-159 E*	*3.97*
934041	*AD1-029 C*	*14.01*
934042	*AD1-029 E*	*9.24*
934201	*AD1-047 C*	*4.29*
934202	*AD1-047 E*	*2.86*

934331	*AD1-057 C O1*	*11.1*
934332	*AD1-057 E O1*	*5.92*
LTF	*AMIL*	*0.26*
LTF	*BAYOU*	*1.35*
LTF	*BIG_CAJUN1*	*2.13*
LTF	*BIG_CAJUN2*	*4.29*
LTF	*BLUEG*	*1.35*
LTF	*CALDERWOOD*	*0.8*
LTF	*CANNELTON*	*0.26*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*0.78*
LTF	*CELEVELAND*	*2.22*
LTF	*CHEOAH*	*0.74*
LTF	*CHILHOWEE*	*0.26*
LTF	*CHOCTAW*	*1.45*
LTF	*CLIFTY*	*4.95*
LTF	*COTTONWOOD*	*5.29*
LTF	*DEARBORN*	*0.49*
LTF	*EDWARDS*	*0.42*
LTF	*ELMERSMITH*	*0.75*
LTF	*FARMERCITY*	*0.33*
LTF	*G-007A*	*0.49*
LTF	*GIBSON*	*0.47*
LTF	*HAMLET*	*3.13*
LTF	*MORGAN*	*2.34*
LTF	*NEWTON*	*1.14*
LTF	*O-066A*	*0.23*
LTF	*PRAIRIE*	*2.46*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.01*
LTF	*ROWAN*	*1.63*
LTF	*SANTEETLA*	*0.22*
LTF	*SMITHLAND*	*0.22*
LTF	*TATANKA*	*0.55*
LTF	*TILTON*	*0.49*
LTF	*TRIMBLE*	*0.26*
LTF	*TVA*	*0.99*
LTF	*UNIONPOWER*	*1.42*
900672	*V4-068 E*	*0.15*
LTF	*VFT*	*1.32*
LTF	*X1-078*	*0.38*
917331	*Z2-043 C*	*0.38*
917332	*Z2-043 E*	*0.82*
917341	*Z2-044 C*	*0.57*
917342	*Z2-044 E*	*1.25*

917511	*Z2-088 C OP1*	*0.92*
917512	*Z2-088 E OP1*	*3.69*
917592	*Z2-099 E*	*0.2*
918411	*AA1-050*	*0.77*
LTF	*AA1-055*	*9.69*
918492	*AA1-063AE OP*	*2.28*
918512	*AA1-065 E OP*	*1.93*
918532	*AA1-067 E*	*0.31*
918561	*AA1-072 C*	*0.06*
918562	*AA1-072 E*	*0.14*
919691	*AA2-053 C*	*1.06*
919692	*AA2-053 E*	*2.32*
919701	*AA2-057 C*	*2.6*
919702	*AA2-057 E*	*6.64*
919821	*AA2-068 C*	*0.64*
919822	*AA2-068 E*	*1.51*
920022	*AA2-086 E*	*0.11*
920042	*AA2-088 E*	*4.77*
920591	*AA2-165 C*	*0.36*
920592	*AA2-165 E*	*0.87*
920671	*AA2-174 C*	*0.05*
920672	*AA2-174 E*	*0.27*
930401	*AB1-081 C*	*20.03*
930402	*AB1-081 E*	*8.59*
930861	*AB1-132 C*	*9.71*
930862	*AB1-132 E*	*4.16*
931231	*AB1-173 C*	*1.21*
931232	*AB1-173 E*	*0.56*
931241	*AB1-173AC*	*1.21*
931242	*AB1-173AE*	*0.56*
923911	*AB2-031 C O1*	*1.2*
923912	*AB2-031 E O1*	*0.59*
923941	*AB2-035 C*	*0.37*
923942	*AB2-035 E*	*0.16*
923991	*AB2-040 C O1*	*3.93*
923992	*AB2-040 E O1*	*3.22*
924151	*AB2-059 C O1*	*23.61*
924152	*AB2-059 E O1*	*12.16*
924381	*AB2-087 C*	*0.31*
924382	*AB2-087 E*	*0.15*
924391	*AB2-088 C*	*0.47*
924392	*AB2-088 E*	*0.23*
924491	*AB2-098 C*	*0.24*
924492	*AB2-098 E*	*0.1*
924501	*AB2-099 C*	*0.31*

924502	*AB2-099 E*	*0.13*
924511	*AB2-100 C*	*5.31*
924512	*AB2-100 E*	*2.61*
925171	*AB2-174 C O1*	*3.6*
925172	*AB2-174 E O1*	*3.26*
925591	*AC1-034 C*	*7.49*
925592	*AC1-034 E*	*5.65*
926071	*AC1-086 C*	*14.29*
926072	*AC1-086 E*	*6.5*
926201	*AC1-098 C*	*7.95*
926202	*AC1-098 E*	*4.73*
926211	*AC1-099 C*	*2.66*
926212	*AC1-099 E*	*1.56*
LTF	*AC1-133*	*9.36*
926771	*AC1-163 C*	*1.04*
926772	*AC1-163 E*	*0.48*
927021	*AC1-189 C*	*6.74*
927022	*AC1-189 E*	*3.36*
927111	*AC1-206 C*	*4.31*
927112	*AC1-206 E*	*2.04*
927141	*AC1-208 C*	*11.27*
927142	*AC1-208 E*	*5.*

Appendix 15

(DVP - DVP) The 6CLUBHSE-6SAPONY 230 kV line (from bus 314563 to bus 314435 ckt 1) loads from 125.88% to 129.7% (**DC power flow**) of its load dump rating (637 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 246T247'. This project contributes approximately 24.29 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 246T247' /* SUFFOLK 230 KV
OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* 6SUFFOLK 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00
OPEN BUS 314575 /* ISLAND: 6NUCO TP 230.00
OPEN BUS 314590 /* ISLAND: 6NUCOR 230.00
OPEN BRANCH FROM BUS 314537 TO BUS 314648 CKT 1 /* 6SUFFOLK 230.00 - 6SUNBURY 230.00
OPEN BRANCH FROM BUS 314648 TO BUS 901080 CKT 1 /* 6SUNBURY 230.00 - W1-029 230.00
OPEN BUS 314648 /* ISLAND: 6SUNBURY 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*10.81*
315132	*1EDGECMB*	*10.81*
315139	*1GASTONA*	*7.59*
315141	*1GASTONB*	*7.59*
315126	*1ROARAP2*	*2.72*
315128	*1ROARAP4*	*2.61*
315136	*1ROSEMG1*	*5.12*
315138	*1ROSEMG2*	*2.4*
315137	*1ROSEMS1*	*3.18*
314557	*3BETHELC*	*0.9*
314554	*3BTLEBRO*	*0.91*
314566	*3CRESWEL*	*1.69*
314572	*3EMPORIA*	*1.04*
314578	*3HORNRTN*	*5.4*
314582	*3KELFORD*	*1.09*
314704	*3LAWRENC*	*0.82*
314603	*3SCOT NK*	*4.39*
314617	*3TUNIS*	*1.*
314541	*3WATKINS*	*0.48*
314620	*6CASHIE*	*0.87*
314574	*6EVERETS*	*2.55*
314594	*6PLYMOTH*	*0.72*

932631	*AC2-084 C*	*11.81*
932632	*AC2-084 E*	*5.82*
933451	*AC2-158 C*	*6.47*
933452	*AC2-158 E*	*6.47*
933461	*AC2-159 C*	*9.91*
933462	*AC2-159 E*	*9.91*
933991	*AD1-023 C*	*12.49*
933992	*AD1-023 E*	*6.8*
934041	*AD1-029 C*	*14.61*
934042	*AD1-029 E*	*9.63*
934201	*AD1-047 C*	*17.56*
934202	*AD1-047 E*	*11.71*
934231	*AD1-050 C*	*5.08*
934232	*AD1-050 E*	*2.78*
934331	*AD1-057 C O1*	*15.84*
934332	*AD1-057 E O1*	*8.45*
934521	*AD1-076 C O1*	*47.2*
934522	*AD1-076 E O1*	*24.03*
LTF	*AD1-120*	*4.44*
LTF	*AD1-121*	*4.42*
LTF	*CARR*	*0.12*
LTF	*CBM-S1*	*5.44*
LTF	*CBM-S2*	*10.91*
LTF	*CBM-W1*	*12.05*
LTF	*CBM-W2*	*29.4*
LTF	*CIN*	*2.71*
LTF	*CPLE*	*3.68*
LTF	*G-007*	*0.77*
LTF	*IPL*	*1.73*
LTF	*LGEE*	*0.58*
LTF	*MEC*	*6.08*
LTF	*MECS*	*2.73*
LTF	*O-066*	*2.57*
LTF	*RENSSELAER*	*0.1*
LTF	*ROSETON*	*0.69*
900671	*V4-068 C*	*0.12*
900672	*V4-068 E*	*0.33*
LTF	*WEC*	*0.74*
917331	*Z2-043 C*	*0.6*
917332	*Z2-043 E*	*1.31*
917341	*Z2-044 C*	*0.32*
917342	*Z2-044 E*	*0.7*
917511	*Z2-088 C OP1*	*1.07*
917512	*Z2-088 E OP1*	*4.29*
917591	*Z2-099 C*	*0.2*

917592	*Z2-099 E*	*0.44*
918411	*AA1-050*	*0.9*
918491	*AA1-063AC OP*	*2.35*
918492	*AA1-063AE OP*	*5.65*
918511	*AA1-065 C OP*	*2.24*
918512	*AA1-065 E OP*	*5.62*
918531	*AA1-067 C*	*0.35*
918532	*AA1-067 E*	*0.76*
918561	*AA1-072 C*	*0.09*
918562	*AA1-072 E*	*0.22*
919691	*AA2-053 C*	*2.72*
919692	*AA2-053 E*	*5.95*
919701	*AA2-057 C*	*1.77*
919702	*AA2-057 E*	*4.52*
919821	*AA2-068 C*	*0.6*
919822	*AA2-068 E*	*1.39*
LTF	*AA2-074*	*2.51*
920021	*AA2-086 C*	*0.1*
920022	*AA2-086 E*	*0.24*
920041	*AA2-088 C*	*1.24*
920042	*AA2-088 E*	*10.3*
920591	*AA2-165 C*	*0.24*
920592	*AA2-165 E*	*0.6*
920631	*AA2-169 C*	*2.8*
920632	*AA2-169 E*	*1.29*
920671	*AA2-174 C*	*0.12*
920672	*AA2-174 E*	*0.69*
920691	*AA2-178 C*	*6.77*
920692	*AA2-178 E*	*2.9*
930051	*AB1-013 C*	*2.04*
930052	*AB1-013 E*	*13.68*
930401	*AB1-081 C*	*10.25*
930402	*AB1-081 E*	*4.39*
930861	*AB1-132 C*	*29.52*
930862	*AB1-132 E*	*12.65*
931231	*AB1-173 C*	*4.94*
931232	*AB1-173 E*	*2.31*
931241	*AB1-173AC*	*4.94*
931242	*AB1-173AE*	*2.31*
923911	*AB2-031 C O1*	*4.9*
923912	*AB2-031 E O1*	*2.42*
923941	*AB2-035 C*	*0.38*
923942	*AB2-035 E*	*0.16*
923991	*AB2-040 C O1*	*16.1*
923992	*AB2-040 E O1*	*13.17*

924021	*AB2-043 C O1*	*2.68*
924022	*AB2-043 E O1*	*4.39*
924151	*AB2-059 C O1*	*12.09*
924152	*AB2-059 E O1*	*6.23*
924161	*AB2-060 C O1*	*7.59*
924162	*AB2-060 E O1*	*3.57*
924301	*AB2-077 C O1*	*1.68*
924302	*AB2-077 E O1*	*1.12*
924311	*AB2-078 C O1*	*1.68*
924312	*AB2-078 E O1*	*1.12*
924321	*AB2-079 C O1*	*1.68*
924322	*AB2-079 E O1*	*1.12*
924381	*AB2-087 C*	*0.74*
924382	*AB2-087 E*	*0.35*
924391	*AB2-088 C*	*0.49*
924392	*AB2-088 E*	*0.23*
924401	*AB2-089 C*	*2.31*
924402	*AB2-089 E*	*1.19*
924411	*AB2-090 C*	*3.37*
924412	*AB2-090 E*	*1.73*
924491	*AB2-098 C*	*0.59*
924492	*AB2-098 E*	*0.26*
924501	*AB2-099 C*	*0.73*
924502	*AB2-099 E*	*0.31*
924511	*AB2-100 C*	*35.91*
924512	*AB2-100 E*	*17.68*
925121	*AB2-169 C*	*6.15*
925122	*AB2-169 E*	*5.52*
925171	*AB2-174 C O1*	*16.16*
925172	*AB2-174 E O1*	*14.62*
925221	*AB2-176 C*	*1.39*
925222	*AB2-176 E*	*0.59*
925291	*AB2-188 C O1*	*1.67*
925292	*AB2-188 E O1*	*0.75*
925591	*AC1-034 C*	*7.73*
925592	*AC1-034 E*	*5.83*
925781	*AC1-054 C*	*8.28*
925782	*AC1-054 E*	*3.81*
926071	*AC1-086 C*	*43.47*
926072	*AC1-086 E*	*19.78*
926201	*AC1-098 C*	*8.29*
926202	*AC1-098 E*	*4.94*
926211	*AC1-099 C*	*2.78*
926212	*AC1-099 E*	*1.63*
926771	*AC1-163 C*	*2.41*

926772	*AC1-163 E*	*1.13*
927021	*AC1-189 C*	*9.39*
927022	*AC1-189 E*	*4.68*
927111	*AC1-206 C*	*32.26*
927112	*AC1-206 E*	*15.25*
927141	*AC1-208 C*	*13.11*
927142	*AC1-208 E*	*5.82*

Appendix 16

(DVP - CPLE) The 6EVERETS-6GREENVILE T 230 kV line (from bus 314574 to bus 304451 ckt 1) loads from 118.91% to 121.74% (**DC power flow**) of its emergency rating (478 MVA) for the tower line contingency outage of 'DVP_P7-1: LN 2058-2181'. This project contributes approximately 13.49 MW to the thermal violation.

CONTINGENCY 'DVP_P7-1: LN 2058-2181'
OPEN BRANCH FROM BUS 304222 TO BUS 313845 CKT 1 /* 6ROCKYMT230T230.00 - 6HATHAWAY 230.00
OPEN BUS 304226 /* ISLAND: 6PA-RMOUNT#4115.00
OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00
OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6HATHAWAY 230.00 - 6NASH 230.00
OPEN BUS 314591 /* ISLAND: 6NASH 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*3.12*
315292	*1DOMTR78*	*2.11*
315293	*1DOMTR9*	*1.72*
315131	*1EDGECMA*	*9.28*
315132	*1EDGECMB*	*9.28*
315136	*1ROSEMG1*	*1.98*
315138	*1ROSEMG2*	*0.93*
315137	*1ROSEMS1*	*1.23*
314557	*3BETHELC*	*1.14*
314554	*3BTLEBRO*	*0.43*
314566	*3CRESWEL*	*2.04*
314572	*3EMPORIA*	*0.21*
314578	*3HORNRTN*	*2.04*
314582	*3KELFORD*	*0.72*
314603	*3SCOT NK*	*2.51*
314617	*3TUNIS*	*0.7*
314539	*3UNCAMP*	*1.18*
314541	*3WATKINS*	*0.36*
314620	*6CASHIE*	*0.88*
314574	*6EVERETS*	*5.39*
314594	*6PLYMOTH*	*0.83*
314648	*6SUNBURY*	*0.4*
314651	*6WINFALL*	*0.97*
932631	*AC2-084 C*	*6.16*
932632	*AC2-084 E*	*3.04*
933451	*AC2-158 C*	*5.87*
933452	*AC2-158 E*	*5.87*

933461	*AC2-159 C*	*5.22*
933462	*AC2-159 E*	*5.22*
933711	*AC2-194 C*	*0.6*
933712	*AC2-194 E*	*0.97*
933991	*AD1-023 C*	*13.46*
933992	*AD1-023 E*	*7.33*
934041	*AD1-029 C*	*7.62*
934042	*AD1-029 E*	*5.02*
934201	*AD1-047 C*	*4.28*
934202	*AD1-047 E*	*2.86*
934331	*AD1-057 C O1*	*8.8*
934332	*AD1-057 E O1*	*4.69*
934521	*AD1-076 C O1*	*54.73*
934522	*AD1-076 E O1*	*27.87*
LTF	*AMIL*	*0.48*
LTF	*BAYOU*	*2.64*
LTF	*BIG_CAJUN1*	*4.17*
LTF	*BIG_CAJUN2*	*8.39*
LTF	*BLUEG*	*2.5*
LTF	*CALDERWOOD*	*1.54*
LTF	*CANNELTON*	*0.48*
LTF	*CATAWBA*	*1.51*
LTF	*CBM-N*	*< 0.01*
LTF	*CELEVELAND*	*4.27*
LTF	*CHEOAH*	*1.44*
LTF	*CHILHOWEE*	*0.5*
LTF	*CHOCTAW*	*2.84*
LTF	*CLIFTY*	*9.05*
LTF	*COTTONWOOD*	*10.33*
LTF	*DEARBORN*	*0.9*
LTF	*EDWARDS*	*0.78*
LTF	*ELMERSMITH*	*1.42*
LTF	*FARMERCITY*	*0.62*
LTF	*G-007A*	*1.03*
LTF	*GIBSON*	*0.88*
LTF	*HAMLET*	*6.47*
LTF	*MORGAN*	*4.57*
LTF	*NEWTON*	*2.15*
LTF	*NYISO*	*0.09*
LTF	*O-066A*	*0.47*
LTF	*PRAIRIE*	*4.69*
LTF	*ROWAN*	*2.99*
LTF	*SANTEETLA*	*0.43*
LTF	*SMITHLAND*	*0.42*
LTF	*TATANKA*	*1.05*

LTF	*TILTON*	*0.92*
LTF	*TRIMBLE*	*0.47*
LTF	*TVA*	*1.92*
LTF	*UNIONPOWER*	*2.74*
900672	*V4-068 E*	*0.21*
LTF	*VFT*	*2.75*
901082	*W1-029E*	*23.36*
907092	*X1-038 E*	*2.96*
LTF	*X1-078*	*0.8*
913392	*Y1-086 E*	*1.05*
916042	*Z1-036 E*	*29.11*
917122	*Z2-027 E*	*0.51*
917331	*Z2-043 C*	*0.39*
917332	*Z2-043 E*	*0.86*
917342	*Z2-044 E*	*0.33*
917511	*Z2-088 C OP1*	*1.52*
917512	*Z2-088 E OP1*	*6.13*
917592	*Z2-099 E*	*0.26*
918411	*AA1-050*	*1.28*
918492	*AA1-063AE OP*	*2.44*
918511	*AA1-065 C OP*	*1.93*
918512	*AA1-065 E OP*	*4.84*
918531	*AA1-067 C*	*0.74*
918532	*AA1-067 E*	*1.62*
918561	*AA1-072 C*	*0.06*
918562	*AA1-072 E*	*0.14*
919692	*AA2-053 E*	*2.58*
919702	*AA2-057 E*	*2.12*
919732	*AA2-059 E*	*0.38*
919822	*AA2-068 E*	*0.66*
920022	*AA2-086 E*	*0.14*
920042	*AA2-088 E*	*6.24*
920592	*AA2-165 E*	*0.28*
920672	*AA2-174 E*	*0.3*
920691	*AA2-178 C*	*8.16*
920692	*AA2-178 E*	*3.5*
930051	*AB1-013 C*	*2.46*
930052	*AB1-013 E*	*16.47*
930401	*AB1-081 C*	*5.63*
930402	*AB1-081 E*	*2.41*
930861	*AB1-132 C*	*10.35*
930862	*AB1-132 E*	*4.44*
931231	*AB1-173 C*	*1.2*
931232	*AB1-173 E*	*0.56*
931241	*AB1-173AC*	*1.2*

931242	*AB1-173AE*	*0.56*
923801	*AB2-015 C O1*	*4.39*
923802	*AB2-015 E O1*	*3.6*
923831	*AB2-022 C*	*1.02*
923832	*AB2-022 E*	*0.55*
923911	*AB2-031 C O1*	*1.2*
923912	*AB2-031 E O1*	*0.59*
923941	*AB2-035 C*	*0.48*
923942	*AB2-035 E*	*0.21*
923991	*AB2-040 C O1*	*3.93*
923992	*AB2-040 E O1*	*3.21*
924151	*AB2-059 C O1*	*6.64*
924152	*AB2-059 E O1*	*3.42*
924381	*AB2-087 C*	*0.54*
924382	*AB2-087 E*	*0.26*
924391	*AB2-088 C*	*0.62*
924392	*AB2-088 E*	*0.3*
924491	*AB2-098 C*	*1.26*
924492	*AB2-098 E*	*0.54*
924501	*AB2-099 C*	*0.53*
924502	*AB2-099 E*	*0.23*
924511	*AB2-100 C*	*5.85*
924512	*AB2-100 E*	*2.88*
925121	*AB2-169 C*	*10.01*
925122	*AB2-169 E*	*8.99*
925171	*AB2-174 C O1*	*3.64*
925172	*AB2-174 E O1*	*3.29*
925281	*AB2-186 C*	*0.37*
925282	*AB2-186 E*	*0.16*
925291	*AB2-188 C O1*	*2.01*
925292	*AB2-188 E O1*	*0.9*
925591	*AC1-034 C*	*9.79*
925592	*AC1-034 E*	*7.38*
926071	*AC1-086 C*	*15.25*
926072	*AC1-086 E*	*6.94*
926201	*AC1-098 C*	*4.32*
926202	*AC1-098 E*	*2.58*
926211	*AC1-099 C*	*1.45*
926212	*AC1-099 E*	*0.85*
LTF	*AC1-133*	*22.49*
926771	*AC1-163 C*	*1.74*
926772	*AC1-163 E*	*0.81*
927021	*AC1-189 C*	*15.45*
927022	*AC1-189 E*	*7.7*
927111	*AC1-206 C*	*4.78*

927112	*AC1-206 E*	*2.26*
927141	*AC1-208 C*	*5.74*
927142	*AC1-208 E*	*2.55*

Appendix 17

(DVP - DVP) The 3COX DP-3CHESTNUT 115 kV line (from bus 314577 to bus 313719 ckt 1) loads from 126.12% to 128.77% (**DC power flow**) of its emergency rating (134 MVA) for the single line contingency outage of 'DVP_P1-2: LN 2056-A'. This project contributes approximately 3.56 MW to the thermal violation.

CONTINGENCY 'DVP_P1-2: LN 2056-A'
OPEN BRANCH FROM BUS 313845 TO BUS 934330 CKT 1 /* 6HATHAWAY 230.00 - AD1-057 TAP 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315139	*1GASTONA*	*1.25*
315141	*1GASTONB*	*1.25*
315126	*1ROARAP2*	*1.08*
315128	*1ROARAP4*	*1.04*
315136	*1ROSEMG1*	*0.9*
315138	*1ROSEMG2*	*0.42*
315137	*1ROSEMS1*	*0.56*
315115	*1S HAMPT1*	*0.62*
932631	*AC2-084 C*	*20.12*
933461	*AC2-159 C*	*3.86*
934041	*AD1-029 C*	*24.89*
934201	*AD1-047 C*	*3.88*
934331	*AD1-057 C O1*	*3.56*
LTF	*AMIL*	*0.14*
LTF	*BAYOU*	*0.76*
LTF	*BIG_CAJUN1*	*1.2*
LTF	*BIG_CAJUN2*	*2.42*
LTF	*BLUEG*	*0.74*
LTF	*CALDERWOOD*	*0.45*
LTF	*CANNELTON*	*0.14*
LTF	*CATAWBA*	*0.44*
LTF	*CBM-N*	*< 0.01*
LTF	*CELEVELAND*	*1.26*
LTF	*CHEOAH*	*0.42*
LTF	*CHILHOWEE*	*0.15*
LTF	*CHOCTAW*	*0.82*
LTF	*CLIFTY*	*2.67*
LTF	*COTTONWOOD*	*2.98*
LTF	*DEARBORN*	*0.26*
LTF	*EDWARDS*	*0.23*
LTF	*ELMERSMITH*	*0.41*
LTF	*FARMERCITY*	*0.18*
LTF	*G-007A*	*0.3*

LTF	*GIBSON*	*0.26*
LTF	*HAMLET*	*1.82*
LTF	*MORGAN*	*1.32*
LTF	*NEWTON*	*0.63*
LTF	*NYISO*	*0.02*
LTF	*O-066A*	*0.14*
LTF	*PRAIRIE*	*1.36*
LTF	*ROWAN*	*0.91*
LTF	*SANTEETLA*	*0.12*
LTF	*SMITHLAND*	*0.12*
LTF	*TATANKA*	*0.31*
LTF	*TILTON*	*0.27*
LTF	*TRIMBLE*	*0.14*
LTF	*TVA*	*0.55*
LTF	*UNIONPOWER*	*0.8*
900671	*V4-068 C*	*0.05*
LTF	*VFT*	*0.81*
LTF	*X1-078*	*0.24*
917331	*Z2-043 C*	*0.53*
917591	*Z2-099 C*	*0.09*
918491	*AA1-063AC OP*	*0.96*
918561	*AA1-072 C*	*0.08*
919691	*AA2-053 C*	*1.07*
919821	*AA2-068 C*	*1.19*
920021	*AA2-086 C*	*0.04*
920041	*AA2-088 C*	*0.54*
920631	*AA2-169 C*	*0.91*
920671	*AA2-174 C*	*0.05*
930861	*AB1-132 C*	*4.88*
931231	*AB1-173 C*	*1.09*
931241	*AB1-173AC*	*1.09*
923801	*AB2-015 C O1*	*2.73*
923911	*AB2-031 C O1*	*1.08*
923991	*AB2-040 C O1*	*3.55*
924381	*AB2-087 C*	*0.28*
924501	*AB2-099 C*	*0.28*
925171	*AB2-174 C O1*	*3.12*
925781	*AC1-054 C*	*2.48*
926071	*AC1-086 C*	*7.18*
926201	*AC1-098 C*	*14.12*
926211	*AC1-099 C*	*4.73*
926771	*AC1-163 C*	*0.93*
927141	*AC1-208 C*	*19.61*

Appendix 18

(DVP - DVP) The 6LAKEVEW-6CAROLNA 230 kV line (from bus 314583 to bus 314561 ckt 1) loads from 139.91% to 147.98% (**DC power flow**) of its load dump rating (433 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 23872'. This project contributes approximately 34.98 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 23872' /*_ CARSON
OPEN BRANCH FROM BUS 314282 TO BUS 314435 CKT 1 /*L238 CARSON SAPONY
OPEN BRANCH FROM BUS 314435 TO BUS 314563 CKT 1 /*L238 SAPONY CLUBHOUSE
OPEN BRANCH FROM BUS 314563 TO BUS 314562 CKT 1 /*CLUBHOUSE TX1 230-115
OPEN BRANCH FROM BUS 314282 TO BUS 314902 CKT 1 /*CARSON TX2 500-230
OPEN BRANCH FROM BUS 314282 TO BUS 314455 CKT 1 /*CARSON SC172
END

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*10.67*
315132	*1EDGECMB*	*10.67*
315139	*1GASTONA*	*13.27*
315141	*1GASTONB*	*13.27*
315136	*1ROSEMG1*	*8.68*
315138	*1ROSEMG2*	*4.07*
315137	*1ROSEMS1*	*5.38*
314557	*3BETHELC*	*0.62*
314554	*3BTLEBRO*	*0.64*
314541	*3WATKINS*	*-0.39*
934233	*AD1-050 BAT*	*4.09*
934331	*AD1-057 C O1*	*22.81*
934332	*AD1-057 E O1*	*12.17*
LTF	*CARR*	*0.05*
LTF	*CBM-S1*	*2.67*
LTF	*CBM-S2*	*5.48*
LTF	*CBM-W1*	*5.82*
LTF	*CBM-W2*	*14.4*
LTF	*CIN*	*1.3*
LTF	*CPLE*	*1.84*
LTF	*G-007*	*0.32*
LTF	*IPL*	*0.83*
LTF	*LGEE*	*0.28*
LTF	*MEC*	*2.95*
LTF	*MECS*	*1.31*
LTF	*O-066*	*1.06*

LTF	*RENSSELAER*	*0.04*
LTF	*ROSETON*	*0.26*
LTF	*WEC*	*0.36*
917511	*Z2-088 C OP1*	*0.61*
917512	*Z2-088 E OP1*	*2.44*
918411	*AA1-050*	*0.51*
930401	*AB1-081 C*	*7.84*
930402	*AB1-081 E*	*3.36*
930861	*AB1-132 C*	*51.62*
930862	*AB1-132 E*	*22.12*
923941	*AB2-035 C*	*0.26*
923942	*AB2-035 E*	*0.11*
924151	*AB2-059 C O1*	*9.24*
924152	*AB2-059 E O1*	*4.76*
924391	*AB2-088 C*	*0.34*
924392	*AB2-088 E*	*0.16*
924511	*AB2-100 C*	*41.18*
924512	*AB2-100 E*	*20.28*
925591	*AC1-034 C*	*5.33*
925592	*AC1-034 E*	*4.02*
926071	*AC1-086 C*	*76.02*
926072	*AC1-086 E*	*34.6*
927111	*AC1-206 C*	*35.47*
927112	*AC1-206 E*	*16.77*

Appendix 19

(DVP - DVP) The 3WITAKRS-3BTLEBRO 115 kV line (from bus 314623 to bus 314554 ckt 1) loads from 161.06% to 163.69% (**DC power flow**) of its emergency rating (134 MVA) for the single line contingency outage of 'DVP_P1-2: LN 2056-A'. This project contributes approximately 3.54 MW to the thermal violation.

CONTINGENCY 'DVP_P1-2: LN 2056-A'
OPEN BRANCH FROM BUS 313845 TO BUS 934330 CKT 1 /* 6HATHAWAY 230.00 - AD1-057 TAP 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315139	*1GASTONA*	*1.25*
315141	*1GASTONB*	*1.25*
315126	*1ROARAP2*	*1.08*
315128	*1ROARAP4*	*1.03*
315136	*1ROSEMG1*	*0.9*
315138	*1ROSEMG2*	*0.42*
315137	*1ROSEMS1*	*0.56*
315115	*1S HAMPT1*	*0.61*
932631	*AC2-084 C*	*20.1*
933461	*AC2-159 C*	*3.84*
934041	*AD1-029 C*	*24.87*
934201	*AD1-047 C*	*3.86*
934331	*AD1-057 C O1*	*3.54*
LTF	*AMIL*	*0.15*
LTF	*BAYOU*	*0.79*
LTF	*BIG_CAJUN1*	*1.25*
LTF	*BIG_CAJUN2*	*2.51*
LTF	*BLUEG*	*0.79*
LTF	*CALDERWOOD*	*0.46*
LTF	*CANNELTON*	*0.15*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*0.45*
LTF	*CELEVELAND*	*1.29*
LTF	*CHEOAH*	*0.43*
LTF	*CHILHOWEE*	*0.15*
LTF	*CHOCTAW*	*0.85*
LTF	*CLIFTY*	*2.89*
LTF	*COTTONWOOD*	*3.1*
LTF	*DEARBORN*	*0.29*
LTF	*EDWARDS*	*0.24*
LTF	*ELMERSMITH*	*0.44*
LTF	*FARMERCITY*	*0.19*
LTF	*G-007A*	*0.23*

LTF	*GIBSON*	*0.28*
LTF	*HAMLET*	*1.86*
LTF	*MORGAN*	*1.37*
LTF	*NEWTON*	*0.67*
LTF	*O-066A*	*0.11*
LTF	*PRAIRIE*	*1.44*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.04*
LTF	*ROWAN*	*0.93*
LTF	*SANTEETLA*	*0.13*
LTF	*SMITHLAND*	*0.13*
LTF	*TATANKA*	*0.32*
LTF	*TILTON*	*0.29*
LTF	*TRIMBLE*	*0.15*
LTF	*TVA*	*0.58*
LTF	*UNIONPOWER*	*0.83*
900671	*V4-068 C*	*0.05*
LTF	*VFT*	*0.61*
LTF	*X1-078*	*0.18*
917331	*Z2-043 C*	*0.53*
917341	*Z2-044 C*	*1.17*
917591	*Z2-099 C*	*0.09*
918491	*AA1-063AC OP*	*0.96*
918561	*AA1-072 C*	*0.08*
919691	*AA2-053 C*	*1.07*
919701	*AA2-057 C*	*5.17*
919821	*AA2-068 C*	*1.19*
920021	*AA2-086 C*	*0.04*
920041	*AA2-088 C*	*0.54*
920591	*AA2-165 C*	*0.71*
920631	*AA2-169 C*	*0.91*
920671	*AA2-174 C*	*0.05*
930861	*AB1-132 C*	*4.85*
931231	*AB1-173 C*	*1.09*
931241	*AB1-173AC*	*1.09*
923801	*AB2-015 C O1*	*2.72*
923911	*AB2-031 C O1*	*1.08*
923991	*AB2-040 C O1*	*3.54*
924381	*AB2-087 C*	*0.28*
924501	*AB2-099 C*	*0.28*
925171	*AB2-174 C O1*	*3.11*
925781	*AC1-054 C*	*2.47*
926071	*AC1-086 C*	*7.14*
926201	*AC1-098 C*	*14.1*
926211	*AC1-099 C*	*4.73*

926771	*AC1-163 C*	*0.93*
927141	*AC1-208 C*	*19.59*

Appendix 20

(DVP - DVP) The AB2-100 TAP-6CLUBHSE 230 kV line (from bus 924510 to bus 314563 ckt 1) loads from 122.52% to 127.92% (**DC power flow**) of its load dump rating (459 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 246T247'. This project contributes approximately 24.66 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 246T247' /* SUFFOLK 230 KV
OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* 6SUFFOLK 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00
OPEN BUS 314575 /* ISLAND: 6NUCO TP 230.00
OPEN BUS 314590 /* ISLAND: 6NUCOR 230.00
OPEN BRANCH FROM BUS 314537 TO BUS 314648 CKT 1 /* 6SUFFOLK 230.00 - 6SUNBURY 230.00
OPEN BRANCH FROM BUS 314648 TO BUS 901080 CKT 1 /* 6SUNBURY 230.00 - W1-029 230.00
OPEN BUS 314648 /* ISLAND: 6SUNBURY 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*2.12*
315131	*1EDGECMA*	*10.48*
315132	*1EDGECMB*	*10.48*
315139	*1GASTONA*	*7.94*
315141	*1GASTONB*	*7.94*
315126	*1ROARAP2*	*1.63*
315128	*1ROARAP4*	*1.57*
315136	*1ROSEMG1*	*5.33*
315138	*1ROSEMG2*	*2.5*
315137	*1ROSEMS1*	*3.31*
314557	*3BETHELC*	*0.87*
314554	*3BTLEBRO*	*0.84*
314566	*3CRESWEL*	*1.64*
314578	*3HORNRTN*	*3.35*
314582	*3KELFORD*	*0.91*
314603	*3SCOT NK*	*3.55*
314617	*3TUNIS*	*0.81*
314620	*6CASHIE*	*0.83*
314574	*6EVERETS*	*2.43*
314594	*6PLYMOTH*	*0.69*
932631	*AC2-084 C*	*9.33*
932632	*AC2-084 E*	*4.6*

933451	*AC2-158 C*	*6.16*
933452	*AC2-158 E*	*6.16*
933461	*AC2-159 C*	*7.09*
933462	*AC2-159 E*	*7.09*
933991	*AD1-023 C*	*11.95*
933992	*AD1-023 E*	*6.5*
934041	*AD1-029 C*	*11.54*
934042	*AD1-029 E*	*7.61*
934331	*AD1-057 C O1*	*16.08*
934332	*AD1-057 E O1*	*8.58*
934521	*AD1-076 C O1*	*45.28*
934522	*AD1-076 E O1*	*23.05*
LTF	*AD1-120*	*3.75*
LTF	*AD1-121*	*3.72*
LTF	*CARR*	*0.09*
LTF	*CBM-S1*	*4.51*
LTF	*CBM-S2*	*9.28*
LTF	*CBM-W1*	*9.82*
LTF	*CBM-W2*	*24.32*
LTF	*CIN*	*2.2*
LTF	*CPLE*	*3.18*
LTF	*G-007*	*0.61*
LTF	*IPL*	*1.4*
LTF	*LGEE*	*0.47*
LTF	*MEC*	*4.99*
LTF	*MECS*	*2.2*
LTF	*O-066*	*2.02*
LTF	*RENSSELAER*	*0.08*
LTF	*ROSETON*	*0.55*
900672	*V4-068 E*	*0.24*
LTF	*WEC*	*0.61*
917331	*Z2-043 C*	*0.5*
917332	*Z2-043 E*	*1.1*
917341	*Z2-044 C*	*0.28*
917342	*Z2-044 E*	*0.61*
917511	*Z2-088 C OP1*	*1.02*
917512	*Z2-088 E OP1*	*4.12*
917592	*Z2-099 E*	*0.3*
918411	*AA1-050*	*0.86*
918491	*AA1-063AC OP*	*1.46*
918492	*AA1-063AE OP*	*3.51*
918511	*AA1-065 C OP*	*2.13*
918512	*AA1-065 E OP*	*5.34*
918531	*AA1-067 C*	*0.33*
918532	*AA1-067 E*	*0.73*

918561	*AA1-072 C*	*0.08*
918562	*AA1-072 E*	*0.18*
919691	*AA2-053 C*	*1.76*
919692	*AA2-053 E*	*3.86*
919701	*AA2-057 C*	*1.46*
919702	*AA2-057 E*	*3.73*
919732	*AA2-059 E*	*0.29*
919821	*AA2-068 C*	*0.46*
919822	*AA2-068 E*	*1.08*
LTF	*AA2-074*	*2.16*
920022	*AA2-086 E*	*0.16*
920042	*AA2-088 E*	*6.95*
920591	*AA2-165 C*	*0.2*
920592	*AA2-165 E*	*0.49*
920631	*AA2-169 C*	*1.37*
920632	*AA2-169 E*	*0.63*
920671	*AA2-174 C*	*0.08*
920672	*AA2-174 E*	*0.45*
920691	*AA2-178 C*	*6.54*
920692	*AA2-178 E*	*2.8*
930051	*AB1-013 C*	*1.97*
930052	*AB1-013 E*	*13.21*
930401	*AB1-081 C*	*9.53*
930402	*AB1-081 E*	*4.08*
930861	*AB1-132 C*	*30.89*
930862	*AB1-132 E*	*13.24*
923941	*AB2-035 C*	*0.37*
923942	*AB2-035 E*	*0.16*
924151	*AB2-059 C O1*	*11.23*
924152	*AB2-059 E O1*	*5.78*
924381	*AB2-087 C*	*0.64*
924382	*AB2-087 E*	*0.3*
924391	*AB2-088 C*	*0.47*
924392	*AB2-088 E*	*0.23*
924491	*AB2-098 C*	*0.57*
924492	*AB2-098 E*	*0.24*
924501	*AB2-099 C*	*0.61*
924502	*AB2-099 E*	*0.26*
924511	*AB2-100 C*	*42.69*
924512	*AB2-100 E*	*21.03*
925121	*AB2-169 C*	*5.87*
925122	*AB2-169 E*	*5.27*
925291	*AB2-188 C O1*	*1.61*
925292	*AB2-188 E O1*	*0.72*
925591	*AC1-034 C*	*7.44*

925592	*AC1-034 E*	*5.62*
926071	*AC1-086 C*	*45.49*
926072	*AC1-086 E*	*20.7*
926201	*AC1-098 C*	*6.55*
926202	*AC1-098 E*	*3.9*
926211	*AC1-099 C*	*2.19*
926212	*AC1-099 E*	*1.29*
926771	*AC1-163 C*	*2.03*
926772	*AC1-163 E*	*0.95*
927021	*AC1-189 C*	*9.*
927022	*AC1-189 E*	*4.48*
927141	*AC1-208 C*	*9.41*
927142	*AC1-208 E*	*4.18*

Appendix 21

(DVP - DVP) The AD1-057 TAP-6MORNSTR 230 kV line (from bus 934330 to bus 313845 ckt 1) loads from 120.69% to 138.03% (**DC power flow**) of its load dump rating (541 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 254T2141'. This project contributes approximately 93.81 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 254T2141' /* LAKEVIEW
OPEN BRANCH FROM BUS 314583 TO BUS 314561 CKT 1 /* 2141
OPEN BRANCH FROM BUS 314583 TO BUS 924510 CKT 1 /* 254
END

Bus Number	*Bus Name*	*Full Contribution*
315139	*1GASTONA*	*21.55*
315141	*1GASTONB*	*21.55*
315136	*1ROSEMG1*	*15.48*
315138	*1ROSEMG2*	*7.25*
315137	*1ROSEMS1*	*9.6*
934331	*AD1-057 C O1*	*61.18*
934332	*AD1-057 E O1*	*32.64*
LTF	*AMIL*	*0.06*
LTF	*BAYOU*	*0.21*
LTF	*BIG_CAJUN1*	*0.32*
LTF	*BIG_CAJUN2*	*0.64*
LTF	*BLUEG*	*0.35*
LTF	*CALDERWOOD*	*0.11*
LTF	*CANNELTON*	*0.06*
LTF	*CARR*	*0.07*
LTF	*CATAWBA*	*0.07*
LTF	*CELEVELAND*	*0.2*
LTF	*CHEOAH*	*0.1*
LTF	*CHILHOWEE*	*0.04*
LTF	*CHOCTAW*	*0.21*
LTF	*CLIFTY*	*1.43*
LTF	*COTTONWOOD*	*0.82*
LTF	*DEARBORN*	*0.17*
LTF	*EDWARDS*	*0.1*
LTF	*ELMERSMITH*	*0.17*
LTF	*FARMERCITY*	*0.07*
LTF	*G-007*	*0.21*
LTF	*GIBSON*	*0.12*
LTF	*HAMLET*	*0.23*
LTF	*MORGAN*	*0.35*
LTF	*NEWTON*	*0.26*
LTF	*O-066*	*0.7*
LTF	*PRAIRIE*	*0.51*

LTF	*RENSSELAER*	*0.06*
LTF	*ROSETON*	*0.42*
LTF	*ROWAN*	*0.14*
LTF	*SANTEETLA*	*0.03*
LTF	*SMITHLAND*	*0.04*
LTF	*TATANKA*	*0.12*
LTF	*TILTON*	*0.12*
LTF	*TRIMBLE*	*0.07*
LTF	*TVA*	*0.15*
LTF	*UNIONPOWER*	*0.15*
930861	*AB1-132 C*	*83.83*
930862	*AB1-132 E*	*35.93*
926071	*AC1-086 C*	*123.46*
926072	*AC1-086 E*	*56.19*

Appendix 22

(AEP - AEP) The 05EDAN 1-05DANVL2 138 kV line (from bus 242631 to bus 242620 ckt 1) loads from 109.47% to 110.15% (**DC power flow**) of its emergency rating (415 MVA) for the line fault with failed breaker contingency outage of 'AEP_P4_#7589_05J.FERR 765'. This project contributes approximately 6.29 MW to the thermal violation.

CONTINGENCY 'AEP_P4_#7589_05J.FERR 765'
OPEN BRANCH FROM BUS 242514 TO BUS 242520 CKT 1 / 242514 05J.FERR 765 242520 05J.FERR 500 1
OPEN BRANCH FROM BUS 242514 TO BUS 242684 CKT 2 / 242514 05J.FERR 765 242684 05J.FERR 138 2
OPEN BRANCH FROM BUS 242520 TO BUS 306719 CKT 1 / 242520 05J.FERR 500 306719 8ANTIOCH 500 1
END

Bus Number	*Bus Name*	*Full Contribution*
244012	*05PINNACLE*	*-2.08*
315131	*1EDGECMA*	*4.25*
315132	*1EDGECMB*	*4.25*
314557	*3BETHELC*	*0.35*
314554	*3BTLEBRO*	*0.37*
314572	*3EMPORIA*	*0.14*
314578	*3HORNRTN*	*1.21*
314582	*3KELFORD*	*0.3*
314603	*3SCOT NK*	*1.24*
314617	*3TUNIS*	*0.28*
314620	*6CASHIE*	*0.27*
314574	*6EVERETS*	*0.98*
314594	*6PLYMOTH*	*0.26*
932631	*AC2-084 C*	*3.42*
932632	*AC2-084 E*	*1.68*
932701	*AC2-093 C*	*24.4*
932702	*AC2-093 E*	*13.96*
932761	*AC2-100 C*	*3.66*
932762	*AC2-100 E*	*1.79*
932821	*AC2-107 C*	*3.48*
932822	*AC2-107 E*	*1.63*
933451	*AC2-158 C*	*1.78*
933452	*AC2-158 E*	*1.78*
933461	*AC2-159 C*	*2.33*
933462	*AC2-159 E*	*2.33*
933941	*AD1-017 C*	*0.84*
933942	*AD1-017 E*	*1.36*
933991	*AD1-023 C*	*4.1*
933992	*AD1-023 E*	*2.23*

934041	*AD1-029 C*	*4.23*
934042	*AD1-029 E*	*2.79*
934201	*AD1-047 C*	*2.75*
934202	*AD1-047 E*	*1.83*
934231	*AD1-050 C*	*2.01*
934232	*AD1-050 E*	*1.1*
934311	*AD1-055 C*	*1.07*
934312	*AD1-055 E*	*0.28*
934331	*AD1-057 C O1*	*4.1*
934332	*AD1-057 E O1*	*2.19*
934341	*AD1-058 C*	*3.99*
934342	*AD1-058 E*	*1.01*
934521	*AD1-076 C O1*	*16.71*
934522	*AD1-076 E O1*	*8.51*
934611	*AD1-087 C O1*	*3.62*
934612	*AD1-087 E O1*	*1.69*
934621	*AD1-088 C O1*	*4.63*
934622	*AD1-088 E O1*	*2.17*
LTF	*AD1-120*	*7.55*
LTF	*AD1-121*	*7.6*
934911	*AD1-123 C*	*0.47*
934912	*AD1-123 E*	*0.24*
934991	*AD1-131 C*	*1.31*
934992	*AD1-131 E*	*0.87*
935171	*AD1-152 C O1*	*3.36*
935172	*AD1-152 E O1*	*2.24*
935221	*AD1-157 C*	*0.46*
935222	*AD1-157 E*	*0.31*
935231	*AD1-160 C*	*0.34*
935232	*AD1-160 E*	*0.47*
LTF	*AMIL*	*0.17*
LTF	*BLUEG*	*2.07*
LTF	*CANNELTON*	*0.27*
LTF	*CARR*	*0.06*
LTF	*CBM-S1*	*1.13*
LTF	*CBM-S2*	*16.92*
LTF	*CBM-W2*	*2.91*
LTF	*CLIFTY*	*10.78*
LTF	*CPLE*	*5.57*
LTF	*DEARBORN*	*0.98*
LTF	*EDWARDS*	*0.45*
LTF	*ELMERSMITH*	*0.71*
LTF	*FARMERCITY*	*0.12*
LTF	*G-007A*	*0.79*
LTF	*GIBSON*	*0.59*

LTF	*NEWTON*	*0.97*
LTF	*O-066A*	*0.36*
LTF	*PRAIRIE*	*0.86*
LTF	*RENSSELAER*	*0.05*
LTF	*ROSETON*	*0.35*
LTF	*SMITHLAND*	*< 0.01*
LTF	*TATANKA*	*0.34*
LTF	*TILTON*	*0.61*
LTF	*TRIMBLE*	*0.41*
900672	*V4-068 E*	*0.1*
LTF	*VFT*	*2.09*
LTF	*X1-078*	*0.61*
917332	*Z2-043 E*	*0.36*
917342	*Z2-044 E*	*0.25*
917512	*Z2-088 E OP1*	*1.66*
917592	*Z2-099 E*	*0.14*
918492	*AA1-063AE OP*	*1.37*
918512	*AA1-065 E OP*	*1.46*
918532	*AA1-067 E*	*0.29*
918562	*AA1-072 E*	*0.06*
919692	*AA2-053 E*	*1.33*
919702	*AA2-057 E*	*1.51*
919822	*AA2-068 E*	*0.41*
LTF	*AA2-074*	*3.79*
920022	*AA2-086 E*	*0.07*
920042	*AA2-088 E*	*3.27*
920592	*AA2-165 E*	*0.2*
920631	*AA2-169 C*	*0.91*
920632	*AA2-169 E*	*0.42*
920672	*AA2-174 E*	*0.15*
930401	*AB1-081 C*	*4.09*
930402	*AB1-081 E*	*1.75*
930861	*AB1-132 C*	*4.93*
930862	*AB1-132 E*	*2.11*
931231	*AB1-173 C*	*0.77*
931232	*AB1-173 E*	*0.36*
931241	*AB1-173AC*	*0.77*
931242	*AB1-173AE*	*0.36*
923911	*AB2-031 C O1*	*0.77*
923912	*AB2-031 E O1*	*0.38*
923941	*AB2-035 C*	*0.15*
923942	*AB2-035 E*	*0.06*
923991	*AB2-040 C O1*	*2.52*
923992	*AB2-040 E O1*	*2.06*
924021	*AB2-043 C O1*	*1.21*

924022	*AB2-043 E O1*	*1.99*
924151	*AB2-059 C O1*	*4.82*
924152	*AB2-059 E O1*	*2.48*
924161	*AB2-060 C O1*	*3.48*
924162	*AB2-060 E O1*	*1.64*
924301	*AB2-077 C O1*	*0.78*
924302	*AB2-077 E O1*	*0.52*
924311	*AB2-078 C O1*	*0.78*
924312	*AB2-078 E O1*	*0.52*
924321	*AB2-079 C O1*	*0.78*
924322	*AB2-079 E O1*	*0.52*
924381	*AB2-087 C*	*0.19*
924382	*AB2-087 E*	*0.09*
924391	*AB2-088 C*	*0.19*
924392	*AB2-088 E*	*0.09*
924401	*AB2-089 C*	*0.91*
924402	*AB2-089 E*	*0.47*
924411	*AB2-090 C*	*1.53*
924412	*AB2-090 E*	*0.78*
924491	*AB2-098 C*	*0.23*
924492	*AB2-098 E*	*0.1*
924501	*AB2-099 C*	*0.2*
924502	*AB2-099 E*	*0.08*
924511	*AB2-100 C*	*3.5*
924512	*AB2-100 E*	*1.72*
925121	*AB2-169 C*	*2.26*
925122	*AB2-169 E*	*2.03*
925171	*AB2-174 C O1*	*2.38*
925172	*AB2-174 E O1*	*2.15*
925221	*AB2-176 C*	*0.63*
925222	*AB2-176 E*	*0.27*
925591	*AC1-034 C*	*3.01*
925592	*AC1-034 E*	*2.27*
925611	*AC1-036 C*	*0.33*
925612	*AC1-036 E*	*0.54*
925781	*AC1-054 C*	*3.03*
925782	*AC1-054 E*	*1.4*
925991	*AC1-075 C*	*1.96*
925992	*AC1-075 E*	*1.11*
926021	*AC1-080 C*	*0.65*
926022	*AC1-080 E*	*0.37*
926051	*AC1-083 C*	*4.18*
926052	*AC1-083 E*	*6.82*
926071	*AC1-086 C*	*7.26*
926072	*AC1-086 E*	*3.31*

926201	*AC1-098 C*	*2.4*
926202	*AC1-098 E*	*1.43*
926211	*AC1-099 C*	*0.8*
926212	*AC1-099 E*	*0.47*
926271	*AC1-105 C*	*2.39*
926272	*AC1-105 E*	*1.19*
926771	*AC1-163 C*	*0.65*
926772	*AC1-163 E*	*0.3*
927021	*AC1-189 C*	*3.63*
927022	*AC1-189 E*	*1.81*
927111	*AC1-206 C*	*2.97*
927112	*AC1-206 E*	*1.4*
927141	*AC1-208 C*	*3.54*
927142	*AC1-208 E*	*1.57*
927251	*AC1-221 C*	*1.59*
927252	*AC1-221 E*	*1.59*
927261	*AC1-222 C*	*1.54*
927262	*AC1-222 E*	*1.46*

OPTION 2

Appendix 1

(DVP - DVP) The 6EARLEYS-6NUCO TP 230 kV line (from bus 314569 to bus 314575 ckt 1) loads from 84.8% to 86.74% (**DC power flow**) of its emergency rating (572 MVA) for the single line contingency outage of 'DVP_P1-2: LN 2131A'. This project contributes approximately 11.08 MW to the thermal violation.

CONTINGENCY 'DVP_P1-2: LN 2131A'
OPEN BRANCH FROM BUS 314662 TO BUS 916040 CKT 1 /* 6S HERTFORD 230.00 - Z1-036 TAP 230.00
OPEN BRANCH FROM BUS 314651 TO BUS 314662 CKT 1 /* 6WINFALL 230.00 - 6S HERTFORD 230.00
OPEN BUS 314662 /* ISLAND
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*4.77*
315292	*1DOMTR78*	*3.23*
315293	*1DOMTR9*	*2.63*
315131	*1EDGECMA*	*9.03*
315132	*1EDGECMB*	*9.03*
315139	*1GASTONA*	*3.89*
315141	*1GASTONB*	*3.89*
315159	*1KERR 2*	*0.85*
315163	*1KERR 6*	*0.84*
315164	*1KERR 7*	*0.84*
315126	*1ROARAP2*	*1.58*
315128	*1ROARAP4*	*1.52*
315136	*1ROSEMG1*	*2.75*
315138	*1ROSEMG2*	*1.29*
315137	*1ROSEMS1*	*1.7*
314704	*3LAWRENC*	*0.23*

932631	*AC2-084 C*	*11.32*
933451	*AC2-158 C*	*12.21*
933461	*AC2-159 C*	*9.55*
933991	*AD1-023 C*	*27.83*
934041	*AD1-029 C*	*14.*
934201	*AD1-047 C*	*6.39*
934231	*AD1-050 C*	*2.75*
934331	*AD1-057 C O2*	*11.08*
934521	*AD1-076 C O2*	*103.01*
LTF	*AD1-120*	*4.28*
LTF	*AD1-121*	*4.25*
LTF	*CARR*	*0.09*
LTF	*CBM-S1*	*5.29*
LTF	*CBM-S2*	*10.69*
LTF	*CBM-W1*	*11.81*
LTF	*CBM-W2*	*28.65*
LTF	*CIN*	*2.65*
LTF	*CPLE*	*3.68*
LTF	*IPL*	*1.69*
LTF	*LGEE*	*0.57*
LTF	*MEC*	*5.94*
LTF	*MECS*	*2.71*
LTF	*RENSSELAER*	*0.07*
LTF	*ROSETON*	*0.5*
900671	*V4-068 C*	*0.11*
LTF	*WEC*	*0.73*

916041	*Z1-036 C*	*2.69*
917331	*Z2-043 C*	*0.76*
917341	*Z2-044 C*	*0.27*
917511	*Z2-088 C OP1*	*1.21*
917591	*Z2-099 C*	*0.13*
918411	*AA1-050*	*1.02*
918491	*AA1-063AC OP*	*1.44*
918511	*AA1-065 C OP*	*4.02*
918531	*AA1-067 C*	*0.52*
918561	*AA1-072 C*	*0.11*
919691	*AA2-053 C*	*2.02*
919701	*AA2-057 C*	*1.49*
919731	*AA2-059 C*	*0.47*
919821	*AA2-068 C*	*0.5*
LTF	*AA2-074*	*2.51*
920021	*AA2-086 C*	*0.07*
920041	*AA2-088 C*	*0.83*
920591	*AA2-165 C*	*0.2*
920631	*AA2-169 C*	*1.56*
920671	*AA2-174 C*	*0.09*
920691	*AA2-178 C*	*19.71*
930051	*AB1-013 C*	*5.95*
930401	*AB1-081 C*	*8.64*
930861	*AB1-132 C*	*15.15*
931231	*AB1-173 C*	*1.8*
931241	*AB1-173AC*	*1.8*

923911	*AB2-031 C O1*	*1.78*
923941	*AB2-035 C*	*0.4*
923991	*AB2-040 C O1*	*5.86*
924151	*AB2-059 C O1*	*10.18*
924381	*AB2-087 C*	*1.08*
924391	*AB2-088 C*	*0.51*
924401	*AB2-089 C*	*1.25*
924491	*AB2-098 C*	*0.88*
924501	*AB2-099 C*	*0.99*
924511	*AB2-100 C*	*7.31*
925121	*AB2-169 C*	*11.96*
925171	*AB2-174 C O1*	*5.33*
925291	*AB2-188 C O1*	*4.86*
925591	*AC1-034 C*	*8.09*
925781	*AC1-054 C*	*4.54*
926071	*AC1-086 C*	*22.31*
926201	*AC1-098 C*	*7.94*
926211	*AC1-099 C*	*2.66*
926771	*AC1-163 C*	*3.28*
927021	*AC1-189 C*	*11.67*
927111	*AC1-206 C*	*5.79*
927141	*AC1-208 C*	*9.96*

Appendix 2

(DVP - DVP) The 6NUCO TP-6SUFFOLK 230 kV line (from bus 314575 to bus 314537 ckt 1) loads from 78.76% to 80.7% (**DC power flow**) of its emergency rating (572 MVA) for the single line contingency outage of 'DVP_P1-2: LN 2131A'. This project contributes approximately 11.08 MW to the thermal violation.

CONTINGENCY 'DVP_P1-2: LN 2131A'
OPEN BRANCH FROM BUS 314662 TO BUS 916040 CKT 1 /* 6S HERTFORD 230.00 - Z1-036 TAP 230.00
OPEN BRANCH FROM BUS 314651 TO BUS 314662 CKT 1 /* 6WINFALL 230.00 - 6S HERTFORD 230.00
OPEN BUS 314662 /* ISLAND
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*4.77*
315292	*1DOMTR78*	*3.23*
315293	*1DOMTR9*	*2.63*
315131	*1EDGECMA*	*9.03*
315132	*1EDGECMB*	*9.03*
315139	*1GASTONA*	*3.89*
315141	*1GASTONB*	*3.89*
315159	*1KERR 2*	*0.85*
315163	*1KERR 6*	*0.84*
315164	*1KERR 7*	*0.84*
315126	*1ROARAP2*	*1.58*
315128	*1ROARAP4*	*1.52*
315136	*1ROSEMG1*	*2.75*
315138	*1ROSEMG2*	*1.29*
315137	*1ROSEMS1*	*1.7*
314704	*3LAWRENC*	*0.23*

932631	*AC2-084 C*	*11.32*
933451	*AC2-158 C*	*12.21*
933461	*AC2-159 C*	*9.55*
933991	*AD1-023 C*	*27.83*
934041	*AD1-029 C*	*14.*
934201	*AD1-047 C*	*6.39*
934231	*AD1-050 C*	*2.75*
934331	*AD1-057 C O2*	*11.08*
934521	*AD1-076 C O2*	*103.01*
LTF	*AD1-120*	*4.28*
LTF	*AD1-121*	*4.25*
LTF	*CARR*	*0.09*
LTF	*CBM-S1*	*5.29*
LTF	*CBM-S2*	*10.69*
LTF	*CBM-W1*	*11.81*
LTF	*CBM-W2*	*28.65*
LTF	*CIN*	*2.65*
LTF	*CPLE*	*3.68*
LTF	*IPL*	*1.69*
LTF	*LGEE*	*0.57*
LTF	*MEC*	*5.94*
LTF	*MECS*	*2.71*
LTF	*RENSSELAER*	*0.07*
LTF	*ROSETON*	*0.5*
900671	*V4-068 C*	*0.11*
LTF	*WEC*	*0.73*

916041	*Z1-036 C*	*2.69*
917331	*Z2-043 C*	*0.76*
917341	*Z2-044 C*	*0.27*
917511	*Z2-088 C OP1*	*1.21*
917591	*Z2-099 C*	*0.13*
918411	*AA1-050*	*1.02*
918491	*AA1-063AC OP*	*1.44*
918511	*AA1-065 C OP*	*4.02*
918531	*AA1-067 C*	*0.52*
918561	*AA1-072 C*	*0.11*
919691	*AA2-053 C*	*2.02*
919701	*AA2-057 C*	*1.49*
919731	*AA2-059 C*	*0.47*
919821	*AA2-068 C*	*0.5*
LTF	*AA2-074*	*2.51*
920021	*AA2-086 C*	*0.07*
920041	*AA2-088 C*	*0.83*
920591	*AA2-165 C*	*0.2*
920631	*AA2-169 C*	*1.56*
920671	*AA2-174 C*	*0.09*
920691	*AA2-178 C*	*19.71*
930051	*AB1-013 C*	*5.95*
930401	*AB1-081 C*	*8.64*
930861	*AB1-132 C*	*15.15*
931231	*AB1-173 C*	*1.8*
931241	*AB1-173AC*	*1.8*

923911	*AB2-031 C O1*	*1.78*
923941	*AB2-035 C*	*0.4*
923991	*AB2-040 C O1*	*5.86*
924151	*AB2-059 C O1*	*10.18*
924381	*AB2-087 C*	*1.08*
924391	*AB2-088 C*	*0.51*
924401	*AB2-089 C*	*1.25*
924491	*AB2-098 C*	*0.88*
924501	*AB2-099 C*	*0.99*
924511	*AB2-100 C*	*7.31*
925121	*AB2-169 C*	*11.96*
925171	*AB2-174 C O1*	*5.33*
925291	*AB2-188 C O1*	*4.86*
925591	*AC1-034 C*	*8.09*
925781	*AC1-054 C*	*4.54*
926071	*AC1-086 C*	*22.31*
926201	*AC1-098 C*	*7.94*
926211	*AC1-099 C*	*2.66*
926771	*AC1-163 C*	*3.28*
927021	*AC1-189 C*	*11.67*
927111	*AC1-206 C*	*5.79*
927141	*AC1-208 C*	*9.96*

Appendix 3

(DVP - DVP) The 3SO JUSTICE-AC1-208 TAP 115 kV line (from bus 313858 to bus 927140 ckt 1) loads from 91.47% to 121.3% (**DC power flow**) of its load dump rating (202 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 12342'. This project contributes approximately 60.27 MW to the thermal violation.

```
CONTINGENCY 'DVP_P4-2: 12342'                    /*BATTLEBORO
  OPEN BUS 314554                              /*BATTLEBORO 115KV BUS
  OPEN BUS 314834                              /*BATTLEBORO 115KV CAP
  END
```

Bus Number	*Bus Name*	*Full Contribution*
314582	*3KELFORD*	*1.21*
314603	*3SCOT NK*	*8.46*
932631	*AC2-084 C*	*28.52*
932632	*AC2-084 E*	*14.05*
934041	*AD1-029 C*	*35.27*
934042	*AD1-029 E*	*23.25*
934331	*AD1-057 C O2*	*39.3*
934332	*AD1-057 E O2*	*20.96*
LTF	*AMIL*	*0.01*
LTF	*BAYOU*	*0.04*
LTF	*BIG_CAJUN1*	*0.06*
LTF	*BIG_CAJUN2*	*0.12*
LTF	*BLUEG*	*0.06*
LTF	*CALDERWOOD*	*0.02*
LTF	*CANNELTON*	*0.01*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*0.02*
LTF	*CELEVELAND*	*0.05*

LTF	*CHEOAH*	*0.02*
LTF	*CHILHOWEE*	*< 0.01*
LTF	*CHOCTAW*	*0.04*
LTF	*CLIFTY*	*0.24*
LTF	*COTTONWOOD*	*0.15*
LTF	*DEARBORN*	*0.03*
LTF	*EDWARDS*	*0.02*
LTF	*ELMERSMITH*	*0.03*
LTF	*FARMERCITY*	*0.01*
LTF	*G-007*	*0.01*
LTF	*GIBSON*	*0.02*
LTF	*HAMLET*	*0.04*
LTF	*MORGAN*	*0.07*
LTF	*NEWTON*	*0.05*
LTF	*O-066*	*0.04*
LTF	*PRAIRIE*	*0.09*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.03*
LTF	*ROWAN*	*0.04*
LTF	*SANTEETLA*	*< 0.01*
LTF	*SMITHLAND*	*< 0.01*
LTF	*TATANKA*	*0.02*
LTF	*TILTON*	*0.02*
LTF	*TRIMBLE*	*0.01*
LTF	*TVA*	*0.03*
LTF	*UNIONPOWER*	*0.03*

917331	*Z2-043 C*	*0.66*
917332	*Z2-043 E*	*1.45*
917341	*Z2-044 C*	*1.06*
917342	*Z2-044 E*	*2.31*
918561	*AA1-072 C*	*0.1*
918562	*AA1-072 E*	*0.24*
919701	*AA2-057 C*	*5.54*
919702	*AA2-057 E*	*14.1*
919821	*AA2-068 C*	*1.72*
919822	*AA2-068 E*	*4.04*
920591	*AA2-165 C*	*0.76*
920592	*AA2-165 E*	*1.86*
926201	*AC1-098 C*	*20.01*
926202	*AC1-098 E*	*11.92*
926211	*AC1-099 C*	*6.7*
926212	*AC1-099 E*	*3.94*

Appendix 4

(DVP - DVP) The 6S HERTFORD-6WINFALL 230 kV line (from bus 314662 to bus 314651 ckt 1) loads from 82.99% to 84.27% (**DC power flow**) of its load dump rating (897 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 24682'. This project contributes approximately 11.5 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 24682' /* 24682 @ SUFFOLK
OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* SUFFOLK - NUCOR TAP
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* NUCOR TAP - EARLEYS
OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* SUFFOLK 230-115 TX#5
OPEN BRANCH FROM BUS 314928 TO BUS 314537 CKT 2 /* SUFFOLK 500-230 TX#8
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*5.68*
315292	*1DOMTR78*	*3.84*
315293	*1DOMTR9*	*3.13*
315132	*1EDGECMB*	*6.42*
315139	*1GASTONA*	*2.57*
315141	*1GASTONB*	*2.57*
315136	*1ROSEMG1*	*1.83*
315138	*1ROSEMG2*	*0.86*
315137	*1ROSEMS1*	*1.14*
314557	*3BETHELC*	*0.69*
314566	*3CRESWEL*	*7.79*
314582	*3KELFORD*	*0.9*
314603	*3SCOT NK*	*3.1*
314617	*3TUNIS*	*0.8*

314620	*6CASHIE*	*1.83*
314574	*6EVERETS*	*2.87*
314594	*6PLYMOTH*	*2.34*
932631	*AC2-084 C*	*7.52*
932632	*AC2-084 E*	*3.7*
933451	*AC2-158 C*	*9.34*
933452	*AC2-158 E*	*9.34*
933461	*AC2-159 C*	*6.2*
933462	*AC2-159 E*	*6.2*
933991	*AD1-023 C*	*31.82*
933992	*AD1-023 E*	*17.32*
934041	*AD1-029 C*	*9.3*
934042	*AD1-029 E*	*6.13*
934331	*AD1-057 C O2*	*7.5*
934332	*AD1-057 E O2*	*4.*
934521	*AD1-076 C O2*	*119.17*
934522	*AD1-076 E O2*	*60.68*
LTF	*CARR*	*0.06*
LTF	*CBM-S1*	*3.82*
LTF	*CBM-S2*	*7.76*
LTF	*CBM-W1*	*8.47*
LTF	*CBM-W2*	*20.64*
LTF	*CIN*	*1.9*
LTF	*CPLE*	*2.68*
LTF	*G-007*	*0.47*
LTF	*IPL*	*1.21*

LTF	*LGEE*	*0.41*
LTF	*MEC*	*4.27*
LTF	*MECS*	*1.94*
LTF	*O-066*	*1.55*
LTF	*RENSSELAER*	*0.05*
LTF	*ROSETON*	*0.38*
900671	*V4-068 C*	*0.07*
900672	*V4-068 E*	*0.21*
LTF	*WEC*	*0.52*
916041	*Z1-036 C*	*5.35*
916042	*Z1-036 E*	*182.46*
917331	*Z2-043 C*	*0.49*
917332	*Z2-043 E*	*1.08*
917341	*Z2-044 C*	*0.19*
917342	*Z2-044 E*	*0.41*
917511	*Z2-088 C OP1*	*0.89*
917512	*Z2-088 E OP1*	*3.58*
918411	*AA1-050*	*0.75*
918511	*AA1-065 C OP*	*2.57*
918512	*AA1-065 E OP*	*6.44*
918531	*AA1-067 C*	*0.39*
918532	*AA1-067 E*	*0.86*
918561	*AA1-072 C*	*0.07*
918562	*AA1-072 E*	*0.18*
919691	*AA2-053 C*	*1.32*
919692	*AA2-053 E*	*2.9*

919701	*AA2-057 C*	*1.02*
919702	*AA2-057 E*	*2.6*
919731	*AA2-059 C*	*0.9*
919732	*AA2-059 E*	*2.15*
919821	*AA2-068 C*	*0.34*
919822	*AA2-068 E*	*0.79*
LTF	*AA2-074*	*1.83*
920591	*AA2-165 C*	*0.14*
920592	*AA2-165 E*	*0.34*
920671	*AA2-174 C*	*0.06*
920672	*AA2-174 E*	*0.33*
920691	*AA2-178 C*	*31.15*
920692	*AA2-178 E*	*13.35*
930051	*AB1-013 C*	*9.4*
930052	*AB1-013 E*	*62.92*
930861	*AB1-132 C*	*10.01*
930862	*AB1-132 E*	*4.29*
923941	*AB2-035 C*	*0.29*
923942	*AB2-035 E*	*0.12*
924381	*AB2-087 C*	*0.69*
924382	*AB2-087 E*	*0.33*
924391	*AB2-088 C*	*0.37*
924392	*AB2-088 E*	*0.18*
924491	*AB2-098 C*	*0.67*
924492	*AB2-098 E*	*0.29*
924501	*AB2-099 C*	*0.64*

924502	*AB2-099 E*	*0.27*
925121	*AB2-169 C*	*13.01*
925122	*AB2-169 E*	*11.67*
925281	*AB2-186 C*	*2.54*
925282	*AB2-186 E*	*1.09*
925291	*AB2-188 C O1*	*7.68*
925292	*AB2-188 E O1*	*3.45*
925591	*AC1-034 C*	*5.93*
925592	*AC1-034 E*	*4.47*
926071	*AC1-086 C*	*14.73*
926072	*AC1-086 E*	*6.71*
926201	*AC1-098 C*	*5.27*
926202	*AC1-098 E*	*3.14*
926211	*AC1-099 C*	*1.77*
926212	*AC1-099 E*	*1.04*
926771	*AC1-163 C*	*2.11*
926772	*AC1-163 E*	*0.99*
927021	*AC1-189 C*	*8.71*
927022	*AC1-189 E*	*4.34*
927141	*AC1-208 C*	*6.67*
927142	*AC1-208 E*	*2.96*

Appendix 5

(DVP - DVP) The Z1-036 TAP-6S HERTFORD 230 kV line (from bus 916040 to bus 314662 ckt 1) loads from 87.09% to 88.37% (**DC power flow**) of its load dump rating (897 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 24682'. This project contributes approximately 11.5 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 24682' /* 24682 @ SUFFOLK
OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* SUFFOLK - NUCOR TAP
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* NUCOR TAP - EARLEYS
OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 2 /* SUFFOLK 230-115 TX#5
OPEN BRANCH FROM BUS 314928 TO BUS 314537 CKT 2 /* SUFFOLK 500-230 TX#8
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*5.68*
315292	*1DOMTR78*	*3.84*
315293	*1DOMTR9*	*3.13*
315131	*1EDGECMA*	*6.42*
315132	*1EDGECMB*	*6.42*
315139	*1GASTONA*	*2.57*
315141	*1GASTONB*	*2.57*
315136	*1ROSEMG1*	*1.83*
315138	*1ROSEMG2*	*0.86*
315137	*1ROSEMS1*	*1.14*
314557	*3BETHELC*	*0.69*
314554	*3BTLEBRO*	*0.54*
314566	*3CRESWEL*	*7.79*
314578	*3HORNRTN*	*2.19*

314582	*3KELFORD*	*0.9*
314603	*3SCOT NK*	*3.1*
314617	*3TUNIS*	*0.8*
314620	*6CASHIE*	*1.83*
314574	*6EVERETS*	*2.87*
314594	*6PLYMOTH*	*2.34*
932631	*AC2-084 C*	*7.52*
932632	*AC2-084 E*	*3.7*
933451	*AC2-158 C*	*9.34*
933452	*AC2-158 E*	*9.34*
933461	*AC2-159 C*	*6.2*
933462	*AC2-159 E*	*6.2*
933991	*AD1-023 C*	*31.82*
933992	*AD1-023 E*	*17.32*
934041	*AD1-029 C*	*9.3*
934042	*AD1-029 E*	*6.13*
934331	*AD1-057 C O2*	*7.5*
934332	*AD1-057 E O2*	*4.*
934521	*AD1-076 C O2*	*119.17*
934522	*AD1-076 E O2*	*60.68*
LTF	*CARR*	*0.06*
LTF	*CBM-S1*	*3.82*
LTF	*CBM-S2*	*7.76*
LTF	*CBM-W1*	*8.47*
LTF	*CBM-W2*	*20.64*
LTF	*CIN*	*1.9*

LTF	*CPLE*	*2.68*
LTF	*G-007*	*0.47*
LTF	*IPL*	*1.21*
LTF	*LGEE*	*0.41*
LTF	*MEC*	*4.27*
LTF	*MECS*	*1.94*
LTF	*O-066*	*1.55*
LTF	*RENSSELAER*	*0.05*
LTF	*ROSETON*	*0.38*
900671	*V4-068 C*	*0.07*
900672	*V4-068 E*	*0.21*
LTF	*WEC*	*0.52*
916041	*Z1-036 C*	*5.35*
916042	*Z1-036 E*	*182.46*
917331	*Z2-043 C*	*0.49*
917332	*Z2-043 E*	*1.08*
917341	*Z2-044 C*	*0.19*
917342	*Z2-044 E*	*0.41*
917511	*Z2-088 C OP1*	*0.89*
917512	*Z2-088 E OP1*	*3.58*
918411	*AA1-050*	*0.75*
918511	*AA1-065 C OP*	*2.57*
918512	*AA1-065 E OP*	*6.44*
918531	*AA1-067 C*	*0.39*
918532	*AA1-067 E*	*0.86*
918561	*AA1-072 C*	*0.07*

918562	*AA1-072 E*	*0.18*
919691	*AA2-053 C*	*1.32*
919692	*AA2-053 E*	*2.9*
919701	*AA2-057 C*	*1.02*
919702	*AA2-057 E*	*2.6*
919731	*AA2-059 C*	*0.9*
919732	*AA2-059 E*	*2.15*
919821	*AA2-068 C*	*0.34*
919822	*AA2-068 E*	*0.79*
LTF	*AA2-074*	*1.83*
920591	*AA2-165 C*	*0.14*
920592	*AA2-165 E*	*0.34*
920671	*AA2-174 C*	*0.06*
920672	*AA2-174 E*	*0.33*
920691	*AA2-178 C*	*31.15*
920692	*AA2-178 E*	*13.35*
930051	*AB1-013 C*	*9.4*
930052	*AB1-013 E*	*62.92*
930401	*AB1-081 C*	*6.09*
930402	*AB1-081 E*	*2.61*
930861	*AB1-132 C*	*10.01*
930862	*AB1-132 E*	*4.29*
923941	*AB2-035 C*	*0.29*
923942	*AB2-035 E*	*0.12*
924151	*AB2-059 C O1*	*7.18*
924152	*AB2-059 E O1*	*3.7*

924381	*AB2-087 C*	*0.69*
924382	*AB2-087 E*	*0.33*
924391	*AB2-088 C*	*0.37*
924392	*AB2-088 E*	*0.18*
924491	*AB2-098 C*	*0.67*
924492	*AB2-098 E*	*0.29*
924501	*AB2-099 C*	*0.64*
924502	*AB2-099 E*	*0.27*
925121	*AB2-169 C*	*13.01*
925122	*AB2-169 E*	*11.67*
925291	*AB2-188 C O1*	*7.68*
925292	*AB2-188 E O1*	*3.45*
925591	*AC1-034 C*	*5.93*
925592	*AC1-034 E*	*4.47*
926071	*AC1-086 C*	*14.73*
926072	*AC1-086 E*	*6.71*
926201	*AC1-098 C*	*5.27*
926202	*AC1-098 E*	*3.14*
926211	*AC1-099 C*	*1.77*
926212	*AC1-099 E*	*1.04*
926771	*AC1-163 C*	*2.11*
926772	*AC1-163 E*	*0.99*
927021	*AC1-189 C*	*8.71*
927022	*AC1-189 E*	*4.34*
927141	*AC1-208 C*	*6.67*
927142	*AC1-208 E*	*2.96*

Appendix 6

(DVP - DVP) The AC1-098 TAP-3SCOT NK 115 kV line (from bus 926200 to bus 314603 ckt 1) loads from 87.43% to 110.58% (**DC power flow**) of its load dump rating (406 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 8142'. This project contributes approximately 93.99 MW to the thermal violation.

```
CONTINGENCY 'DVP_P4-2: 8142'                    /* BATTLEBORO
  OPEN BUS 314554                               /*BATTLEBORO 115KV BUS
  OPEN BUS 314556                               /*LINE 80
  OPEN BUS 314567                               /*LINE 80
  OPEN BUS 314205                               /*LINE 80
  OPEN BUS 314834                               /*BATTLEBORO 115KV CAP
  OPEN BUS 314623                               /*LINE 81
  OPEN BUS 314577                               /*LINE 81
  OPEN BUS 314628                               /*LINE 81
  OPEN BUS 314598                               /*LINE 81
  OPEN BUS 314578                               /*LINE 81
  END
```

Bus Number	*Bus Name*	*Full Contribution*
932631	*AC2-084 C*	*53.6*
932632	*AC2-084 E*	*26.4*
934041	*AD1-029 C*	*66.3*
934042	*AD1-029 E*	*43.7*
934331	*AD1-057 C O2*	*61.3*
934332	*AD1-057 E O2*	*32.7*
LTF	*AMIL*	*< 0.01*
LTF	*BAYOU*	*< 0.01*
LTF	*BIG_CAJUN1*	*0.01*
LTF	*BIG_CAJUN2*	*0.02*
LTF	*BLUEG*	*0.01*
LTF	*CALDERWOOD*	*< 0.01*
LTF	*CANNELTON*	*< 0.01*

LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*< 0.01*
LTF	*CELEVELAND*	*< 0.01*
LTF	*CHEOAH*	*< 0.01*
LTF	*CHILHOWEE*	*< 0.01*
LTF	*CHOCTAW*	*< 0.01*
LTF	*CLIFTY*	*0.05*
LTF	*COTTONWOOD*	*0.03*
LTF	*DEARBORN*	*< 0.01*
LTF	*EDWARDS*	*< 0.01*
LTF	*ELMERSMITH*	*< 0.01*
LTF	*FARMERCITY*	*< 0.01*
LTF	*G-007*	*< 0.01*
LTF	*GIBSON*	*< 0.01*
LTF	*HAMLET*	*< 0.01*
LTF	*MORGAN*	*0.01*
LTF	*NEWTON*	*< 0.01*
LTF	*O-066*	*0.02*
LTF	*PRAIRIE*	*0.02*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.01*
LTF	*ROWAN*	*< 0.01*
LTF	*SANTEETLA*	*< 0.01*
LTF	*SMITHLAND*	*< 0.01*
LTF	*TATANKA*	*< 0.01*
LTF	*TILTON*	*< 0.01*

LTF	*TRIMBLE*	*< 0.01*
LTF	*TVA*	*< 0.01*
LTF	*UNIONPOWER*	*< 0.01*
919821	*AA2-068 C*	*2.69*
919822	*AA2-068 E*	*6.3*
926201	*AC1-098 C*	*37.6*
926202	*AC1-098 E*	*22.4*
926211	*AC1-099 C*	*12.6*
926212	*AC1-099 E*	*7.4*
927141	*AC1-208 C*	*55.4*
927142	*AC1-208 E*	*24.6*

Appendix 7

(DVP - DVP) The AD1-057 TAP-3SO JUSTICE 115 kV line (from bus 934330 to bus 313858 ckt 1) loads from 84.18% to 105.55% (**DC power flow**) of its load dump rating (202 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 254T2141'. This project contributes approximately 45.5 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 254T2141' /* LAKEVIEW
OPEN BRANCH FROM BUS 314583 TO BUS 314561 CKT 1 /* 2141
OPEN BRANCH FROM BUS 314583 TO BUS 924510 CKT 1 /* 254
END

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*5.26*
315132	*1EDGECMB*	*5.26*
314554	*3BTLEBRO*	*0.87*
934043	*AD1-029 BAT*	*42.11*
934331	*AD1-057 C O2*	*29.67*
934332	*AD1-057 E O2*	*15.83*
LTF	*CARR*	*0.01*
LTF	*CBM-S1*	*1.77*
LTF	*CBM-S2*	*3.47*
LTF	*CBM-W1*	*4.06*
LTF	*CBM-W2*	*9.61*
LTF	*CIN*	*0.91*
LTF	*CPLE*	*1.16*
LTF	*G-007*	*0.15*
LTF	*IPL*	*0.58*
LTF	*LGEE*	*0.19*
LTF	*MEC*	*2.01*
LTF	*MECS*	*0.96*

LTF	*O-066*	*0.49*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.07*
LTF	*WEC*	*0.25*
917341	*Z2-044 C*	*0.47*
917342	*Z2-044 E*	*1.03*
919701	*AA2-057 C*	*3.41*
919702	*AA2-057 E*	*8.68*
920591	*AA2-165 C*	*0.46*
920592	*AA2-165 E*	*1.14*
930401	*AB1-081 C*	*8.77*
930402	*AB1-081 E*	*3.76*
930861	*AB1-132 C*	*7.64*
930862	*AB1-132 E*	*3.27*
924151	*AB2-059 C O1*	*10.34*
924152	*AB2-059 E O1*	*5.33*
926071	*AC1-086 C*	*11.25*
926072	*AC1-086 E*	*5.12*

Appendix 8

(DVP - DVP) The 3CHESTNUT-3WITAKRS 115 kV line (from bus 313719 to bus 314623 ckt 1) loads from 184.21% to 217.68% (**DC power flow**) of its load dump rating (174 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 5602'. This project contributes approximately 58.24 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 5602' /* CAROLINA 115 KV
OPEN BRANCH FROM BUS 313723 TO BUS 314604 CKT 1 /* 3PECAN 115.00 - 3SEABORD 115.00
OPEN BRANCH FROM BUS 314558 TO BUS 314587 CKT 1 /* 3BOYKINS 115.00 - 3MARGTSV 115.00
OPEN BRANCH FROM BUS 314587 TO BUS 314604 CKT 1 /* 3MARGTSV 115.00 - 3SEABORD 115.00
OPEN BUS 314587 /* ISLAND: 3MARGTSV 115.00
OPEN BUS 314604 /* ISLAND: 3SEABORD 115.00
OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00
OPEN BRANCH FROM BUS 314559 TO BUS 919690 CKT 1 /* 3CAROLNA 115.00 - AA2-053 TAP 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

Bus Number	*Bus Name*	*Full Contribution*
315126	*1ROARAP2*	*3.85*
315128	*1ROARAP4*	*3.7*
314578	*3HORNRTN*	*8.39*
314582	*3KELFORD*	*1.13*
314603	*3SCOT NK*	*7.6*
932631	*AC2-084 C*	*25.35*
932632	*AC2-084 E*	*12.48*
934041	*AD1-029 C*	*31.35*
934042	*AD1-029 E*	*20.67*
934231	*AD1-050 C*	*3.78*

934232	*AD1-050 E*	*2.06*
934331	*AD1-057 C O2*	*37.98*
934332	*AD1-057 E O2*	*20.26*
LTF	*AMIL*	*0.07*
LTF	*BAYOU*	*0.38*
LTF	*BIG_CAJUN1*	*0.59*
LTF	*BIG_CAJUN2*	*1.19*
LTF	*BLUEG*	*0.39*
LTF	*CALDERWOOD*	*0.22*
LTF	*CANNELTON*	*0.07*
LTF	*CARR*	*0.02*
LTF	*CATAWBA*	*0.21*
LTF	*CELEVELAND*	*0.59*
LTF	*CHEOAH*	*0.2*
LTF	*CHILHOWEE*	*0.07*
LTF	*CHOCTAW*	*0.4*
LTF	*CLIFTY*	*1.44*
LTF	*COTTONWOOD*	*1.48*
LTF	*DEARBORN*	*0.15*
LTF	*EDWARDS*	*0.12*
LTF	*ELMERSMITH*	*0.22*
LTF	*FARMERCITY*	*0.09*
LTF	*G-007*	*0.02*
LTF	*GIBSON*	*0.14*
LTF	*HAMLET*	*0.89*
LTF	*MORGAN*	*0.65*

LTF	*NEWTON*	*0.33*
LTF	*O-066*	*0.06*
LTF	*PRAIRIE*	*0.7*
LTF	*RENSSELAER*	*0.02*
LTF	*ROSETON*	*0.12*
LTF	*ROWAN*	*0.42*
LTF	*SANTEETLA*	*0.06*
LTF	*SMITHLAND*	*0.06*
LTF	*TATANKA*	*0.16*
LTF	*TILTON*	*0.14*
LTF	*TRIMBLE*	*0.07*
LTF	*TVA*	*0.27*
LTF	*UNIONPOWER*	*0.38*
917331	*Z2-043 C*	*0.62*
917332	*Z2-043 E*	*1.35*
918491	*AA1-063AC OP*	*3.94*
918492	*AA1-063AE OP*	*9.47*
918561	*AA1-072 C*	*0.09*
918562	*AA1-072 E*	*0.23*
919701	*AA2-057 C*	*5.99*
919702	*AA2-057 E*	*15.26*
919821	*AA2-068 C*	*1.52*
919822	*AA2-068 E*	*3.57*
920591	*AA2-165 C*	*0.82*
920592	*AA2-165 E*	*2.01*
920631	*AA2-169 C*	*2.82*

920632	*AA2-169 E*	*1.3*
924401	*AB2-089 C*	*1.71*
924402	*AB2-089 E*	*0.88*
926201	*AC1-098 C*	*17.78*
926202	*AC1-098 E*	*10.59*
926211	*AC1-099 C*	*5.96*
926212	*AC1-099 E*	*3.5*
927141	*AC1-208 C*	*28.79*
927142	*AC1-208 E*	*12.78*

Appendix 9

(DVP - CPLE) The 6MORNSTR-6ROCKYMT230T 230 kV line (from bus 313845 to bus 304222 ckt 1) loads from 139.51% to 144.38% (**DC power flow**) of its emergency rating (374 MVA) for the tower line contingency outage of 'DVP_P7-1: LN 81-2056'. This project contributes approximately 18.14 MW to the thermal violation.

CONTINGENCY 'DVP_P7-1: LN 81-2056'
OPEN BRANCH FROM BUS 314559 TO BUS 314578 CKT 1 /* 3CAROLNA 115.00 - 3HORNRTN 115.00
OPEN BRANCH FROM BUS 314578 TO BUS 314598 CKT 1 /* 3HORNRTN 115.00 - 3ROAN DP 115.00
OPEN BRANCH FROM BUS 314598 TO BUS 314628 CKT 1 /* 3ROAN DP 115.00 - 3DARLINGT DP115.00
OPEN BUS 314578 /* ISLAND: 3HORNRTN 115.00
OPEN BUS 314598 /* ISLAND: 3ROAN DP 115.00
OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00
OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6MORNSTR 230.00 - 6NASH 230.00
OPEN BRANCH FROM BUS 304226 TO BUS 304222 CKT 1 /* 6PA-RMOUNT#4230.00 - 6ROCKYMT230T
OPEN BUS 304226 /* ISLAND
OPEN BUS 314591 /* ISLAND: 6NASH 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*24.8*
315132	*1EDGECMB*	*24.8*
315139	*1GASTONA*	*4.01*
315141	*1GASTONB*	*4.01*
315126	*1ROARAP2*	*1.22*
315128	*1ROARAP4*	*1.18*
315136	*1ROSEMG1*	*3.36*
315138	*1ROSEMG2*	*1.57*
315137	*1ROSEMS1*	*2.09*
314557	*3BETHELC*	*1.61*

314554	*3BTLEBRO*	*1.08*
314566	*3CRESWEL*	*1.09*
314572	*3EMPORIA*	*0.27*
314582	*3KELFORD*	*0.7*
314603	*3SCOT NK*	*3.23*
314617	*3TUNIS*	*0.55*
314541	*3WATKINS*	*0.33*
314620	*6CASHIE*	*0.49*
314574	*6EVERETS*	*1.81*
314594	*6PLYMOTH*	*0.44*
932631	*AC2-084 C*	*9.38*
932632	*AC2-084 E*	*4.62*
933451	*AC2-158 C*	*3.44*
933452	*AC2-158 E*	*3.44*
933461	*AC2-159 C*	*4.87*
933462	*AC2-159 E*	*4.87*
933991	*AD1-023 C*	*7.25*
933992	*AD1-023 E*	*3.95*
934041	*AD1-029 C*	*11.6*
934042	*AD1-029 E*	*7.65*
934071	*AD1-034 C O2*	*3.43*
934072	*AD1-034 E O2*	*2.22*
934201	*AD1-047 C*	*5.53*
934202	*AD1-047 E*	*3.69*
934331	*AD1-057 C O2*	*11.83*
934332	*AD1-057 E O2*	*6.31*

934521	*AD1-076 C O2*	*31.66*
934522	*AD1-076 E O2*	*16.12*
LTF	*AMIL*	*0.38*
LTF	*BAYOU*	*1.98*
LTF	*BIG_CAJUN1*	*3.12*
LTF	*BIG_CAJUN2*	*6.28*
LTF	*BLUEG*	*1.99*
LTF	*CALDERWOOD*	*1.17*
LTF	*CANNELTON*	*0.38*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*1.14*
LTF	*CELEVELAND*	*3.25*
LTF	*CHEOAH*	*1.09*
LTF	*CHILHOWEE*	*0.38*
LTF	*CHOCTAW*	*2.13*
LTF	*CLIFTY*	*7.32*
LTF	*COTTONWOOD*	*7.76*
LTF	*DEARBORN*	*0.72*
LTF	*EDWARDS*	*0.61*
LTF	*ELMERSMITH*	*1.11*
LTF	*FARMERCITY*	*0.48*
LTF	*G-007A*	*0.76*
LTF	*GIBSON*	*0.69*
LTF	*HAMLET*	*4.52*
LTF	*MORGAN*	*3.43*
LTF	*NEWTON*	*1.68*

LTF	*O-066A*	*0.35*
LTF	*PRAIRIE*	*3.62*
LTF	*ROWAN*	*2.4*
LTF	*SANTEETLA*	*0.32*
LTF	*SMITHLAND*	*0.32*
LTF	*TATANKA*	*0.82*
LTF	*TILTON*	*0.73*
LTF	*TRIMBLE*	*0.38*
LTF	*TVA*	*1.45*
LTF	*UNIONPOWER*	*2.08*
900671	*V4-068 C*	*0.07*
900672	*V4-068 E*	*0.18*
LTF	*VFT*	*2.03*
LTF	*X1-078*	*0.59*
917331	*Z2-043 C*	*0.38*
917332	*Z2-043 E*	*0.84*
917341	*Z2-044 C*	*0.34*
917342	*Z2-044 E*	*0.75*
917511	*Z2-088 C OP1*	*1.68*
917512	*Z2-088 E OP1*	*6.74*
917592	*Z2-099 E*	*0.25*
918411	*AA1-050*	*1.41*
918491	*AA1-063AC OP*	*1.14*
918492	*AA1-063AE OP*	*2.74*
918511	*AA1-065 C OP*	*1.16*
918512	*AA1-065 E OP*	*2.92*

918531	*AA1-067 C*	*0.25*
918532	*AA1-067 E*	*0.54*
918561	*AA1-072 C*	*0.06*
918562	*AA1-072 E*	*0.14*
919691	*AA2-053 C*	*1.27*
919692	*AA2-053 E*	*2.78*
919701	*AA2-057 C*	*1.72*
919702	*AA2-057 E*	*4.39*
919821	*AA2-068 C*	*0.51*
919822	*AA2-068 E*	*1.19*
920022	*AA2-086 E*	*0.14*
920042	*AA2-088 E*	*5.93*
920591	*AA2-165 C*	*0.23*
920592	*AA2-165 E*	*0.58*
920671	*AA2-174 C*	*0.06*
920672	*AA2-174 E*	*0.32*
920691	*AA2-178 C*	*4.34*
920692	*AA2-178 E*	*1.86*
930051	*AB1-013 C*	*1.31*
930052	*AB1-013 E*	*8.77*
930401	*AB1-081 C*	*14.55*
930402	*AB1-081 E*	*6.23*
930861	*AB1-132 C*	*15.61*
930862	*AB1-132 E*	*6.69*
931231	*AB1-173 C*	*1.56*
931232	*AB1-173 E*	*0.73*

931241	*AB1-173AC*	*1.56*
931242	*AB1-173AE*	*0.73*
923801	*AB2-015 C O1*	*3.93*
923802	*AB2-015 E O1*	*3.23*
923911	*AB2-031 C O1*	*1.54*
923912	*AB2-031 E O1*	*0.76*
923941	*AB2-035 C*	*0.68*
923942	*AB2-035 E*	*0.29*
923991	*AB2-040 C O1*	*5.07*
923992	*AB2-040 E O1*	*4.15*
924151	*AB2-059 C O1*	*17.14*
924152	*AB2-059 E O1*	*8.83*
924381	*AB2-087 C*	*0.4*
924382	*AB2-087 E*	*0.19*
924391	*AB2-088 C*	*0.87*
924392	*AB2-088 E*	*0.42*
924491	*AB2-098 C*	*0.42*
924492	*AB2-098 E*	*0.18*
924501	*AB2-099 C*	*0.4*
924502	*AB2-099 E*	*0.17*
924511	*AB2-100 C*	*8.29*
924512	*AB2-100 E*	*4.08*
925121	*AB2-169 C*	*4.03*
925122	*AB2-169 E*	*3.62*
925171	*AB2-174 C O1*	*4.74*
925172	*AB2-174 E O1*	*4.29*

925291	*AB2-188 C O1*	*1.07*
925292	*AB2-188 E O1*	*0.48*
925591	*AC1-034 C*	*13.75*
925592	*AC1-034 E*	*10.37*
926071	*AC1-086 C*	*22.99*
926072	*AC1-086 E*	*10.47*
926201	*AC1-098 C*	*6.58*
926202	*AC1-098 E*	*3.92*
926211	*AC1-099 C*	*2.2*
926212	*AC1-099 E*	*1.29*
926771	*AC1-163 C*	*1.32*
926772	*AC1-163 E*	*0.62*
927021	*AC1-189 C*	*12.21*
927022	*AC1-189 E*	*6.08*
927111	*AC1-206 C*	*6.69*
927112	*AC1-206 E*	*3.16*
927141	*AC1-208 C*	*10.44*
927142	*AC1-208 E*	*4.63*

Appendix 10

(DVP - DVP) The 6CARSON-6CHRL249 230 kV line (from bus 314282 to bus 314285 ckt 1) loads from 111.37% to 111.87% (**DC power flow**) of its load dump rating (684 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 562T563'. This project contributes approximately 7.97 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 562T563' /*CARSON
OPEN BRANCH FROM BUS 314902 TO BUS 314923 CKT 1 /*CARSON TO MIDLOTHIAN
OPEN BRANCH FROM BUS 314914 TO BUS 314902 CKT 1 /*CARSON 500.00 - 8SEPTA 500.00
END

Bus Number	*Bus Name*	*Full Contribution*
315105	*1BRUNSWICKS1*	*11.25*
315131	*1EDGECMA*	*4.76*
315132	*1EDGECMB*	*4.76*
315139	*1GASTONA*	*2.46*
315141	*1GASTONB*	*2.46*
315136	*1ROSEMG1*	*1.7*
315138	*1ROSEMG2*	*0.8*
315137	*1ROSEMS1*	*1.06*
315073	*1STONECA*	*-2.58*
314557	*3BETHELC*	*0.39*
314554	*3BTLEBRO*	*0.41*
314572	*3EMPORIA*	*0.33*
314578	*3HORNRTN*	*1.92*
314582	*3KELFORD*	*0.39*
314704	*3LAWRENC*	*0.28*
314603	*3SCOT NK*	*1.62*
314617	*3TUNIS*	*0.36*

314541	*3WATKINS*	*0.24*
314620	*6CASHIE*	*0.31*
314574	*6EVERETS*	*1.06*
932631	*AC2-084 C*	*4.46*
932632	*AC2-084 E*	*2.2*
932701	*AC2-093 C*	*40.58*
932702	*AC2-093 E*	*23.21*
932761	*AC2-100 C*	*2.16*
932762	*AC2-100 E*	*1.05*
933451	*AC2-158 C*	*2.15*
933452	*AC2-158 E*	*2.15*
933461	*AC2-159 C*	*3.44*
933462	*AC2-159 E*	*3.44*
933991	*AD1-023 C*	*4.58*
933992	*AD1-023 E*	*2.49*
934041	*AD1-029 C*	*5.52*
934042	*AD1-029 E*	*3.64*
934071	*AD1-034 C O2*	*9.22*
934072	*AD1-034 E O2*	*5.97*
934201	*AD1-047 C*	*5.74*
934202	*AD1-047 E*	*3.83*
934231	*AD1-050 C*	*2.37*
934232	*AD1-050 E*	*1.3*
934311	*AD1-055 C*	*1.03*
934312	*AD1-055 E*	*0.27*
934331	*AD1-057 C O2*	*5.2*

934332	*AD1-057 E O2*	*2.77*
934341	*AD1-058 C*	*2.35*
934342	*AD1-058 E*	*0.6*
934521	*AD1-076 C O2*	*19.48*
934522	*AD1-076 E O2*	*9.92*
934611	*AD1-087 C O2*	*3.75*
934612	*AD1-087 E O2*	*1.75*
934621	*AD1-088 C O2*	*6.62*
934622	*AD1-088 E O2*	*3.11*
LTF	*AD1-120*	*5.26*
LTF	*AD1-121*	*5.24*
934911	*AD1-123 C*	*0.45*
934912	*AD1-123 E*	*0.23*
934991	*AD1-131 C*	*0.77*
934992	*AD1-131 E*	*0.51*
935171	*AD1-152 C O2*	*3.36*
935172	*AD1-152 E O2*	*2.24*
935211	*AD1-156 C*	*1.*
935212	*AD1-156 E*	*0.67*
LTF	*CARR*	*0.18*
LTF	*CBM-S1*	*6.32*
LTF	*CBM-S2*	*12.36*
LTF	*CBM-W1*	*13.64*
LTF	*CBM-W2*	*33.99*
LTF	*CIN*	*3.08*
LTF	*CPLE*	*3.87*

LTF	*G-007*	*1.04*
LTF	*IPL*	*1.96*
LTF	*LGEE*	*0.67*
LTF	*MEC*	*6.97*
LTF	*MECS*	*3.01*
LTF	*O-066*	*3.47*
LTF	*RENSSELAER*	*0.14*
LTF	*ROSETON*	*1.04*
292791	*U1-032 E*	*-1.34*
900672	*V4-068 E*	*0.13*
LTF	*WEC*	*0.84*
916301	*Z1-086 C*	*33.*
916302	*Z1-086 E*	*5.26*
917332	*Z2-043 E*	*0.46*
917342	*Z2-044 E*	*0.3*
917512	*Z2-088 E OP1*	*1.84*
917592	*Z2-099 E*	*0.18*
918492	*AA1-063AE OP*	*2.09*
918512	*AA1-065 E OP*	*1.82*
918532	*AA1-067 E*	*0.32*
918562	*AA1-072 E*	*0.08*
919692	*AA2-053 E*	*2.08*
919702	*AA2-057 E*	*1.84*
919822	*AA2-068 E*	*0.54*
LTF	*AA2-074*	*2.63*
920022	*AA2-086 E*	*0.1*

920042	*AA2-088 E*	*4.33*
920592	*AA2-165 E*	*0.24*
920631	*AA2-169 C*	*1.18*
920632	*AA2-169 E*	*0.54*
920672	*AA2-174 E*	*0.24*
930401	*AB1-081 C*	*4.55*
930402	*AB1-081 E*	*1.95*
930861	*AB1-132 C*	*9.57*
930862	*AB1-132 E*	*4.1*
931231	*AB1-173 C*	*1.61*
931232	*AB1-173 E*	*0.75*
931241	*AB1-173AC*	*1.61*
931242	*AB1-173AE*	*0.75*
923851	*AB2-025 C*	*0.57*
923852	*AB2-025 E*	*1.3*
923911	*AB2-031 C O1*	*1.6*
923912	*AB2-031 E O1*	*0.79*
923941	*AB2-035 C*	*0.16*
923942	*AB2-035 E*	*0.07*
923991	*AB2-040 C O1*	*5.26*
923992	*AB2-040 E O1*	*4.3*
924021	*AB2-043 C O1*	*1.43*
924022	*AB2-043 E O1*	*2.34*
924151	*AB2-059 C O1*	*5.37*
924152	*AB2-059 E O1*	*2.76*
924161	*AB2-060 C O1*	*4.07*

924162	*AB2-060 E O1*	*1.92*
924301	*AB2-077 C O1*	*0.91*
924302	*AB2-077 E O1*	*0.6*
924311	*AB2-078 C O1*	*0.91*
924312	*AB2-078 E O1*	*0.6*
924321	*AB2-079 C O1*	*0.91*
924322	*AB2-079 E O1*	*0.6*
924381	*AB2-087 C*	*0.25*
924382	*AB2-087 E*	*0.12*
924391	*AB2-088 C*	*0.21*
924392	*AB2-088 E*	*0.1*
924401	*AB2-089 C*	*1.08*
924402	*AB2-089 E*	*0.55*
924411	*AB2-090 C*	*1.8*
924412	*AB2-090 E*	*0.92*
924491	*AB2-098 C*	*0.25*
924492	*AB2-098 E*	*0.11*
924501	*AB2-099 C*	*0.26*
924502	*AB2-099 E*	*0.11*
924511	*AB2-100 C*	*10.65*
924512	*AB2-100 E*	*5.25*
925121	*AB2-169 C*	*2.45*
925122	*AB2-169 E*	*2.2*
925171	*AB2-174 C O1*	*5.22*
925172	*AB2-174 E O1*	*4.72*
925221	*AB2-176 C*	*0.74*

925222	*AB2-176 E*	*0.32*
925591	*AC1-034 C*	*3.33*
925592	*AC1-034 E*	*2.52*
925611	*AC1-036 C*	*0.37*
925612	*AC1-036 E*	*0.61*
925781	*AC1-054 C*	*3.71*
925782	*AC1-054 E*	*1.71*
926071	*AC1-086 C*	*14.1*
926072	*AC1-086 E*	*6.42*
926201	*AC1-098 C*	*3.13*
926202	*AC1-098 E*	*1.86*
926211	*AC1-099 C*	*1.05*
926212	*AC1-099 E*	*0.62*
926271	*AC1-105 C*	*2.38*
926272	*AC1-105 E*	*1.19*
926771	*AC1-163 C*	*0.84*
926772	*AC1-163 E*	*0.39*
927021	*AC1-189 C*	*3.98*
927022	*AC1-189 E*	*1.98*
927111	*AC1-206 C*	*9.5*
927112	*AC1-206 E*	*4.49*
927141	*AC1-208 C*	*4.92*
927142	*AC1-208 E*	*2.19*
927251	*AC1-221 C*	*0.94*
927252	*AC1-221 E*	*0.94*
927261	*AC1-222 C*	*1.48*

927262	*AC1-222 E*	*1.41*

Appendix 11

(DVP - DVP) The 6CHRL249-6LOCKS 230 kV line (from bus 314285 to bus 314316 ckt 1) loads from 108.56% to 109.06% (**DC power flow**) of its load dump rating (684 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 562T563'. This project contributes approximately 7.97 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 562T563' /*CARSON
OPEN BRANCH FROM BUS 314902 TO BUS 314923 CKT 1 /*CARSON TO MIDLOTHIAN
OPEN BRANCH FROM BUS 314914 TO BUS 314902 CKT 1 /*CARSON 500.00 - 8SEPTA 500.00
END

Bus Number	*Bus Name*	*Full Contribution*
315105	*1BRUNSWICKS1*	*11.25*
315131	*1EDGECMA*	*4.76*
315132	*1EDGECMB*	*4.76*
315139	*1GASTONA*	*2.46*
315141	*1GASTONB*	*2.46*
315136	*1ROSEMG1*	*1.7*
315138	*1ROSEMG2*	*0.8*
315137	*1ROSEMS1*	*1.06*
315073	*1STONECA*	*-2.58*
314557	*3BETHELC*	*0.39*
314554	*3BTLEBRO*	*0.41*
314572	*3EMPORIA*	*0.33*
314578	*3HORNRTN*	*1.92*
314582	*3KELFORD*	*0.39*
314704	*3LAWRENC*	*0.28*
314603	*3SCOT NK*	*1.62*
314617	*3TUNIS*	*0.36*

314541	*3WATKINS*	*0.24*
314620	*6CASHIE*	*0.31*
314574	*6EVERETS*	*1.06*
932631	*AC2-084 C*	*4.46*
932632	*AC2-084 E*	*2.2*
932701	*AC2-093 C*	*40.58*
932702	*AC2-093 E*	*23.21*
932761	*AC2-100 C*	*2.16*
932762	*AC2-100 E*	*1.05*
933451	*AC2-158 C*	*2.15*
933452	*AC2-158 E*	*2.15*
933461	*AC2-159 C*	*3.44*
933462	*AC2-159 E*	*3.44*
933991	*AD1-023 C*	*4.58*
933992	*AD1-023 E*	*2.49*
934041	*AD1-029 C*	*5.52*
934042	*AD1-029 E*	*3.64*
934071	*AD1-034 C O2*	*9.22*
934072	*AD1-034 E O2*	*5.97*
934201	*AD1-047 C*	*5.74*
934202	*AD1-047 E*	*3.83*
934231	*AD1-050 C*	*2.37*
934232	*AD1-050 E*	*1.3*
934311	*AD1-055 C*	*1.03*
934312	*AD1-055 E*	*0.27*
934331	*AD1-057 C O2*	*5.2*

934332	*AD1-057 E O2*	*2.77*
934341	*AD1-058 C*	*2.35*
934342	*AD1-058 E*	*0.6*
934521	*AD1-076 C O2*	*19.48*
934522	*AD1-076 E O2*	*9.92*
934611	*AD1-087 C O2*	*3.75*
934612	*AD1-087 E O2*	*1.75*
934621	*AD1-088 C O2*	*6.62*
934622	*AD1-088 E O2*	*3.11*
LTF	*AD1-120*	*5.26*
LTF	*AD1-121*	*5.24*
934911	*AD1-123 C*	*0.45*
934912	*AD1-123 E*	*0.23*
934991	*AD1-131 C*	*0.77*
934992	*AD1-131 E*	*0.51*
935171	*AD1-152 C O2*	*3.36*
935172	*AD1-152 E O2*	*2.24*
935211	*AD1-156 C*	*1.*
935212	*AD1-156 E*	*0.67*
LTF	*CARR*	*0.18*
LTF	*CBM-S1*	*6.32*
LTF	*CBM-S2*	*12.36*
LTF	*CBM-W1*	*13.64*
LTF	*CBM-W2*	*33.99*
LTF	*CIN*	*3.08*
LTF	*CPLE*	*3.87*

LTF	*G-007*	*1.04*
LTF	*IPL*	*1.96*
LTF	*LGEE*	*0.67*
LTF	*MEC*	*6.97*
LTF	*MECS*	*3.01*
LTF	*O-066*	*3.47*
LTF	*RENSSELAER*	*0.14*
LTF	*ROSETON*	*1.04*
292791	*U1-032 E*	*-1.34*
900672	*V4-068 E*	*0.13*
LTF	*WEC*	*0.84*
916301	*Z1-086 C*	*33.*
916302	*Z1-086 E*	*5.26*
917332	*Z2-043 E*	*0.46*
917342	*Z2-044 E*	*0.3*
917512	*Z2-088 E OP1*	*1.84*
917592	*Z2-099 E*	*0.18*
918492	*AA1-063AE OP*	*2.09*
918512	*AA1-065 E OP*	*1.82*
918532	*AA1-067 E*	*0.32*
918562	*AA1-072 E*	*0.08*
919692	*AA2-053 E*	*2.08*
919702	*AA2-057 E*	*1.84*
919822	*AA2-068 E*	*0.54*
LTF	*AA2-074*	*2.63*
920022	*AA2-086 E*	*0.1*

920042	*AA2-088 E*	*4.33*
920592	*AA2-165 E*	*0.24*
920631	*AA2-169 C*	*1.18*
920632	*AA2-169 E*	*0.54*
920672	*AA2-174 E*	*0.24*
930401	*AB1-081 C*	*4.55*
930402	*AB1-081 E*	*1.95*
930861	*AB1-132 C*	*9.57*
930862	*AB1-132 E*	*4.1*
931231	*AB1-173 C*	*1.61*
931232	*AB1-173 E*	*0.75*
931241	*AB1-173AC*	*1.61*
931242	*AB1-173AE*	*0.75*
923851	*AB2-025 C*	*0.57*
923852	*AB2-025 E*	*1.3*
923911	*AB2-031 C O1*	*1.6*
923912	*AB2-031 E O1*	*0.79*
923941	*AB2-035 C*	*0.16*
923942	*AB2-035 E*	*0.07*
923991	*AB2-040 C O1*	*5.26*
923992	*AB2-040 E O1*	*4.3*
924021	*AB2-043 C O1*	*1.43*
924022	*AB2-043 E O1*	*2.34*
924151	*AB2-059 C O1*	*5.37*
924152	*AB2-059 E O1*	*2.76*
924161	*AB2-060 C O1*	*4.07*

924162	*AB2-060 E O1*	*1.92*
924301	*AB2-077 C O1*	*0.91*
924302	*AB2-077 E O1*	*0.6*
924311	*AB2-078 C O1*	*0.91*
924312	*AB2-078 E O1*	*0.6*
924321	*AB2-079 C O1*	*0.91*
924322	*AB2-079 E O1*	*0.6*
924381	*AB2-087 C*	*0.25*
924382	*AB2-087 E*	*0.12*
924391	*AB2-088 C*	*0.21*
924392	*AB2-088 E*	*0.1*
924401	*AB2-089 C*	*1.08*
924402	*AB2-089 E*	*0.55*
924411	*AB2-090 C*	*1.8*
924412	*AB2-090 E*	*0.92*
924491	*AB2-098 C*	*0.25*
924492	*AB2-098 E*	*0.11*
924501	*AB2-099 C*	*0.26*
924502	*AB2-099 E*	*0.11*
924511	*AB2-100 C*	*10.65*
924512	*AB2-100 E*	*5.25*
925121	*AB2-169 C*	*2.45*
925122	*AB2-169 E*	*2.2*
925171	*AB2-174 C O1*	*5.22*
925172	*AB2-174 E O1*	*4.72*
925221	*AB2-176 C*	*0.74*

925222	*AB2-176 E*	*0.32*
925591	*AC1-034 C*	*3.33*
925592	*AC1-034 E*	*2.52*
925611	*AC1-036 C*	*0.37*
925612	*AC1-036 E*	*0.61*
925781	*AC1-054 C*	*3.71*
925782	*AC1-054 E*	*1.71*
926071	*AC1-086 C*	*14.1*
926072	*AC1-086 E*	*6.42*
926201	*AC1-098 C*	*3.13*
926202	*AC1-098 E*	*1.86*
926211	*AC1-099 C*	*1.05*
926212	*AC1-099 E*	*0.62*
926271	*AC1-105 C*	*2.38*
926272	*AC1-105 E*	*1.19*
926771	*AC1-163 C*	*0.84*
926772	*AC1-163 E*	*0.39*
927021	*AC1-189 C*	*3.98*
927022	*AC1-189 E*	*1.98*
927111	*AC1-206 C*	*9.5*
927112	*AC1-206 E*	*4.49*
927141	*AC1-208 C*	*4.92*
927142	*AC1-208 E*	*2.19*
927251	*AC1-221 C*	*0.94*
927252	*AC1-221 E*	*0.94*
927261	*AC1-222 C*	*1.48*

927262	*AC1-222 E*	*1.41*

Appendix 12

(DVP - CPLE) The 3BTLEBRO-3ROCKYMT115T 115 kV line (from bus 314554 to bus 304223 ckt 1) loads from 441.97% to 468.81% (**DC power flow**) of its emergency rating (93 MVA) for the tower line contingency outage of 'DVP_P7-1: LN 2058-2181'. This project contributes approximately 24.95 MW to the thermal violation.

CONTINGENCY 'DVP_P7-1: LN 2058-2181'
OPEN BRANCH FROM BUS 304222 TO BUS 313845 CKT 1 /* 6ROCKYMT230T230.00 - 6HATHAWAY 230.00
OPEN BUS 304226 /* ISLAND: 6PA-RMOUNT#4115.00
OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00
OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6HATHAWAY 230.00 - 6NASH 230.00
OPEN BUS 314591 /* ISLAND: 6NASH 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*13.41*
315132	*1EDGECMB*	*13.41*
315139	*1GASTONA*	*2.49*
315141	*1GASTONB*	*2.49*
315126	*1ROARAP2*	*1.04*
315128	*1ROARAP4*	*1.*
315136	*1ROSEMG1*	*2.02*
315138	*1ROSEMG2*	*0.95*
315137	*1ROSEMS1*	*1.25*
314557	*3BETHELC*	*0.88*
314554	*3BTLEBRO*	*1.95*
314572	*3EMPORIA*	*0.2*
314578	*3HORNRTN*	*2.51*
314582	*3KELFORD*	*0.68*

314603	*3SCOT NK*	*3.67*
314617	*3TUNIS*	*0.44*
314574	*6EVERETS*	*1.04*
932631	*AC2-084 C*	*11.33*
932632	*AC2-084 E*	*5.58*
933451	*AC2-158 C*	*2.27*
933452	*AC2-158 E*	*2.27*
933461	*AC2-159 C*	*3.97*
933462	*AC2-159 E*	*3.97*
934041	*AD1-029 C*	*14.01*
934042	*AD1-029 E*	*9.24*
934201	*AD1-047 C*	*4.29*
934202	*AD1-047 E*	*2.86*
934331	*AD1-057 C O2*	*16.27*
934332	*AD1-057 E O2*	*8.68*
LTF	*AMIL*	*0.26*
LTF	*BAYOU*	*1.35*
LTF	*BIG_CAJUN1*	*2.13*
LTF	*BIG_CAJUN2*	*4.29*
LTF	*BLUEG*	*1.35*
LTF	*CALDERWOOD*	*0.8*
LTF	*CANNELTON*	*0.26*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*0.78*
LTF	*CELEVELAND*	*2.22*
LTF	*CHEOAH*	*0.74*

LTF	*CHILHOWEE*	*0.26*
LTF	*CHOCTAW*	*1.45*
LTF	*CLIFTY*	*4.95*
LTF	*COTTONWOOD*	*5.3*
LTF	*DEARBORN*	*0.49*
LTF	*EDWARDS*	*0.42*
LTF	*ELMERSMITH*	*0.75*
LTF	*FARMERCITY*	*0.33*
LTF	*G-007A*	*0.49*
LTF	*GIBSON*	*0.47*
LTF	*HAMLET*	*3.14*
LTF	*MORGAN*	*2.34*
LTF	*NEWTON*	*1.14*
LTF	*O-066A*	*0.23*
LTF	*PRAIRIE*	*2.47*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.01*
LTF	*ROWAN*	*1.63*
LTF	*SANTEETLA*	*0.22*
LTF	*SMITHLAND*	*0.22*
LTF	*TATANKA*	*0.56*
LTF	*TILTON*	*0.49*
LTF	*TRIMBLE*	*0.26*
LTF	*TVA*	*0.99*
LTF	*UNIONPOWER*	*1.42*
900672	*V4-068 E*	*0.15*

LTF	*VFT*	*1.31*
LTF	*X1-078*	*0.38*
917331	*Z2-043 C*	*0.38*
917332	*Z2-043 E*	*0.82*
917341	*Z2-044 C*	*0.57*
917342	*Z2-044 E*	*1.25*
917511	*Z2-088 C OP1*	*0.92*
917512	*Z2-088 E OP1*	*3.69*
917592	*Z2-099 E*	*0.2*
918411	*AA1-050*	*0.77*
LTF	*AA1-055*	*9.7*
918492	*AA1-063AE OP*	*2.28*
918512	*AA1-065 E OP*	*1.93*
918532	*AA1-067 E*	*0.31*
918561	*AA1-072 C*	*0.06*
918562	*AA1-072 E*	*0.14*
919691	*AA2-053 C*	*1.06*
919692	*AA2-053 E*	*2.32*
919701	*AA2-057 C*	*2.6*
919702	*AA2-057 E*	*6.64*
919821	*AA2-068 C*	*0.64*
919822	*AA2-068 E*	*1.51*
920022	*AA2-086 E*	*0.11*
920042	*AA2-088 E*	*4.77*
920591	*AA2-165 C*	*0.36*
920592	*AA2-165 E*	*0.87*

920671	*AA2-174 C*	*0.05*
920672	*AA2-174 E*	*0.27*
930401	*AB1-081 C*	*20.03*
930402	*AB1-081 E*	*8.59*
930861	*AB1-132 C*	*9.71*
930862	*AB1-132 E*	*4.16*
931231	*AB1-173 C*	*1.21*
931232	*AB1-173 E*	*0.56*
931241	*AB1-173AC*	*1.21*
931242	*AB1-173AE*	*0.56*
923911	*AB2-031 C O1*	*1.2*
923912	*AB2-031 E O1*	*0.59*
923941	*AB2-035 C*	*0.37*
923942	*AB2-035 E*	*0.16*
923991	*AB2-040 C O1*	*3.93*
923992	*AB2-040 E O1*	*3.22*
924151	*AB2-059 C O1*	*23.61*
924152	*AB2-059 E O1*	*12.16*
924381	*AB2-087 C*	*0.31*
924382	*AB2-087 E*	*0.15*
924391	*AB2-088 C*	*0.47*
924392	*AB2-088 E*	*0.23*
924491	*AB2-098 C*	*0.24*
924492	*AB2-098 E*	*0.1*
924501	*AB2-099 C*	*0.31*
924502	*AB2-099 E*	*0.13*

924511	*AB2-100 C*	*5.31*
924512	*AB2-100 E*	*2.61*
925171	*AB2-174 C O1*	*3.6*
925172	*AB2-174 E O1*	*3.26*
925591	*AC1-034 C*	*7.49*
925592	*AC1-034 E*	*5.65*
926071	*AC1-086 C*	*14.29*
926072	*AC1-086 E*	*6.5*
926201	*AC1-098 C*	*7.95*
926202	*AC1-098 E*	*4.73*
926211	*AC1-099 C*	*2.66*
926212	*AC1-099 E*	*1.56*
LTF	*AC1-133*	*9.37*
926771	*AC1-163 C*	*1.04*
926772	*AC1-163 E*	*0.48*
927021	*AC1-189 C*	*6.74*
927022	*AC1-189 E*	*3.36*
927111	*AC1-206 C*	*4.31*
927112	*AC1-206 E*	*2.04*
927141	*AC1-208 C*	*11.27*
927142	*AC1-208 E*	*5.*

Appendix 13

(DVP - DVP) The 6CAROLNA 230/115 kV transformer (from bus 314559 to bus 314561 ckt 1) loads from 122.37% to 131.96% (**DC power flow**) of its load dump rating (289 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 12342'. This project contributes approximately 27.64 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 12342' /*BATTLEBORO
OPEN BUS 314554 /*BATTLEBORO 115KV BUS
OPEN BUS 314834 /*BATTLEBORO 115KV CAP
END

Bus Number	*Bus Name*	*Full Contribution*
315159	*1KERR 2*	*1.54*
315164	*1KERR 7*	*1.52*
315126	*1ROARAP2*	*3.99*
315128	*1ROARAP4*	*3.84*
315115	*1S HAMPT1*	*1.62*
314572	*3EMPORIA*	*0.31*
314578	*3HORNRTN*	*7.86*
314582	*3KELFORD*	*0.72*
314603	*3SCOT NK*	*4.23*
314617	*3TUNIS*	*0.61*
314539	*3UNCAMP*	*1.74*
314541	*3WATKINS*	*0.61*
932631	*AC2-084 C*	*13.56*
932632	*AC2-084 E*	*6.68*
933461	*AC2-159 C*	*9.8*
933462	*AC2-159 E*	*9.8*
934041	*AD1-029 C*	*16.77*
934042	*AD1-029 E*	*11.05*

934201	*AD1-047 C*	*10.9*
934202	*AD1-047 E*	*7.27*
934231	*AD1-050 C*	*5.53*
934232	*AD1-050 E*	*3.02*
934331	*AD1-057 C O2*	*18.03*
934332	*AD1-057 E O2*	*9.62*
934621	*AD1-088 C O2*	*8.*
934622	*AD1-088 E O2*	*3.75*
LTF	*AMIL*	*0.03*
LTF	*BAYOU*	*0.18*
LTF	*BIG_CAJUN1*	*0.28*
LTF	*BIG_CAJUN2*	*0.57*
LTF	*BLUEG*	*0.16*
LTF	*CALDERWOOD*	*0.1*
LTF	*CANNELTON*	*0.03*
LTF	*CARR*	*0.02*
LTF	*CATAWBA*	*0.1*
LTF	*CELEVELAND*	*0.29*
LTF	*CHEOAH*	*0.1*
LTF	*CHILHOWEE*	*0.03*
LTF	*CHOCTAW*	*0.19*
LTF	*CLIFTY*	*0.58*
LTF	*COTTONWOOD*	*0.7*
LTF	*DEARBORN*	*0.07*
LTF	*EDWARDS*	*0.05*
LTF	*ELMERSMITH*	*0.09*

LTF	*FARMERCITY*	*0.04*
LTF	*G-007*	*0.06*
LTF	*GIBSON*	*0.06*
LTF	*HAMLET*	*0.52*
LTF	*MORGAN*	*0.31*
LTF	*NEWTON*	*0.14*
LTF	*O-066*	*0.21*
LTF	*PRAIRIE*	*0.32*
LTF	*RENSSELAER*	*0.02*
LTF	*ROSETON*	*0.13*
LTF	*ROWAN*	*0.19*
LTF	*SANTEETLA*	*0.03*
LTF	*SMITHLAND*	*0.03*
LTF	*TATANKA*	*0.07*
LTF	*TILTON*	*0.06*
LTF	*TRIMBLE*	*0.03*
LTF	*TVA*	*0.13*
LTF	*UNIONPOWER*	*0.19*
900671	*V4-068 C*	*0.11*
900672	*V4-068 E*	*0.29*
907092	*X1-038 E*	*4.35*
917332	*Z2-043 E*	*0.86*
917341	*Z2-044 C*	*0.48*
917342	*Z2-044 E*	*1.06*
917591	*Z2-099 C*	*0.24*
917592	*Z2-099 E*	*0.53*

918491	*AA1-063AC OP*	*3.28*
918492	*AA1-063AE OP*	*7.88*
918562	*AA1-072 E*	*0.14*
919691	*AA2-053 C*	*3.45*
919692	*AA2-053 E*	*7.55*
919701	*AA2-057 C*	*2.54*
919702	*AA2-057 E*	*6.47*
919821	*AA2-068 C*	*0.79*
919822	*AA2-068 E*	*1.85*
920021	*AA2-086 C*	*0.12*
920022	*AA2-086 E*	*0.29*
920041	*AA2-088 C*	*1.49*
920042	*AA2-088 E*	*12.42*
920591	*AA2-165 C*	*0.35*
920592	*AA2-165 E*	*0.85*
920631	*AA2-169 C*	*3.47*
920632	*AA2-169 E*	*1.59*
920671	*AA2-174 C*	*0.16*
920672	*AA2-174 E*	*0.87*
931231	*AB1-173 C*	*3.07*
931232	*AB1-173 E*	*1.43*
931241	*AB1-173AC*	*3.07*
931242	*AB1-173AE*	*1.43*
923801	*AB2-015 C O1*	*7.02*
923802	*AB2-015 E O1*	*5.75*
923911	*AB2-031 C O1*	*3.04*

923912	*AB2-031 E O1*	*1.5*
923991	*AB2-040 C O1*	*9.99*
923992	*AB2-040 E O1*	*8.18*
924021	*AB2-043 C O1*	*1.73*
924022	*AB2-043 E O1*	*2.84*
924161	*AB2-060 C O1*	*4.92*
924162	*AB2-060 E O1*	*2.31*
924301	*AB2-077 C O1*	*1.11*
924302	*AB2-077 E O1*	*0.74*
924311	*AB2-078 C O1*	*1.11*
924312	*AB2-078 E O1*	*0.74*
924321	*AB2-079 C O1*	*1.11*
924322	*AB2-079 E O1*	*0.74*
924401	*AB2-089 C*	*2.51*
924402	*AB2-089 E*	*1.29*
924411	*AB2-090 C*	*2.18*
924412	*AB2-090 E*	*1.12*
924501	*AB2-099 C*	*0.34*
924502	*AB2-099 E*	*0.15*
925171	*AB2-174 C O1*	*7.89*
925172	*AB2-174 E O1*	*7.14*
925221	*AB2-176 C*	*0.9*
925222	*AB2-176 E*	*0.38*
925781	*AC1-054 C*	*9.53*
925782	*AC1-054 E*	*4.39*
926201	*AC1-098 C*	*9.51*

926202	*AC1-098 E*	*5.67*
926211	*AC1-099 C*	*3.19*
926212	*AC1-099 E*	*1.87*
926771	*AC1-163 C*	*1.14*
926772	*AC1-163 E*	*0.53*
927141	*AC1-208 C*	*18.02*
927142	*AC1-208 E*	*8.*

Appendix 14

(DVP - DVP) The 6CLUBHSE-AD1-034 TAP 230 kV line (from bus 314563 to bus 934070 ckt 1) loads from 127.76% to 130.89% (**DC power flow**) of its load dump rating (637 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 246T2034'. This project contributes approximately 21.79 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 246T2034' /* EARLEYS
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 246
OPEN BRANCH FROM BUS 314575 TO BUS 314537 CKT 1 /* 246
OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 246 - NUCOR
OPEN BRANCH FROM BUS 314569 TO BUS 933450 CKT 1 /* 2034
END

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*11.46*
315132	*1EDGECMB*	*11.46*
315139	*1GASTONA*	*7.99*
315141	*1GASTONB*	*7.99*
315126	*1ROARAP2*	*2.89*
315128	*1ROARAP4*	*2.78*
315136	*1ROSEMG1*	*5.4*
315138	*1ROSEMG2*	*2.53*
315137	*1ROSEMS1*	*3.35*
314557	*3BETHELC*	*0.96*
314554	*3BTLEBRO*	*0.97*
314572	*3EMPORIA*	*1.07*
314578	*3HORNRTN*	*5.76*
314582	*3KELFORD*	*1.24*
314704	*3LAWRENC*	*0.85*
314603	*3SCOT NK*	*4.89*
314617	*3TUNIS*	*1.14*

314541	*3WATKINS*	*0.52*
314574	*6EVERETS*	*2.71*
932631	*AC2-084 C*	*12.97*
932632	*AC2-084 E*	*6.39*
933461	*AC2-159 C*	*10.98*
933462	*AC2-159 E*	*10.98*
934041	*AD1-029 C*	*16.05*
934042	*AD1-029 E*	*10.58*
934201	*AD1-047 C*	*18.26*
934202	*AD1-047 E*	*12.17*
934231	*AD1-050 C*	*5.37*
934232	*AD1-050 E*	*2.93*
934331	*AD1-057 C O2*	*14.21*
934332	*AD1-057 E O2*	*7.58*
934621	*AD1-088 C O2*	*12.9*
934622	*AD1-088 E O2*	*6.05*
LTF	*AD1-120*	*4.72*
LTF	*AD1-121*	*4.7*
LTF	*CARR*	*0.12*
LTF	*CBM-S1*	*5.81*
LTF	*CBM-S2*	*11.59*
LTF	*CBM-W1*	*12.9*
LTF	*CBM-W2*	*31.36*
LTF	*CIN*	*2.91*
LTF	*CPLE*	*3.91*
LTF	*G-007*	*0.8*

LTF	*IPL*	*1.85*
LTF	*LGEE*	*0.63*
LTF	*MEC*	*6.5*
LTF	*MECS*	*2.94*
LTF	*O-066*	*2.67*
LTF	*RENSSELAER*	*0.1*
LTF	*ROSETON*	*0.7*
900671	*V4-068 C*	*0.13*
900672	*V4-068 E*	*0.37*
LTF	*WEC*	*0.8*
917331	*Z2-043 C*	*0.68*
917332	*Z2-043 E*	*1.49*
917341	*Z2-044 C*	*0.34*
917342	*Z2-044 E*	*0.75*
917511	*Z2-088 C OP1*	*1.13*
917512	*Z2-088 E OP1*	*4.55*
917591	*Z2-099 C*	*0.22*
917592	*Z2-099 E*	*0.48*
918411	*AA1-050*	*0.95*
918491	*AA1-063AC OP*	*2.52*
918492	*AA1-063AE OP*	*6.06*
918511	*AA1-065 C OP*	*2.7*
918512	*AA1-065 E OP*	*6.77*
918531	*AA1-067 C*	*0.37*
918532	*AA1-067 E*	*0.81*
918561	*AA1-072 C*	*0.1*

918562	*AA1-072 E*	*0.25*
919691	*AA2-053 C*	*2.94*
919692	*AA2-053 E*	*6.44*
919701	*AA2-057 C*	*1.91*
919702	*AA2-057 E*	*4.86*
919821	*AA2-068 C*	*0.64*
919822	*AA2-068 E*	*1.51*
LTF	*AA2-074*	*2.66*
920021	*AA2-086 C*	*0.11*
920022	*AA2-086 E*	*0.26*
920041	*AA2-088 C*	*1.35*
920042	*AA2-088 E*	*11.25*
920591	*AA2-165 C*	*0.26*
920592	*AA2-165 E*	*0.64*
920631	*AA2-169 C*	*2.97*
920632	*AA2-169 E*	*1.36*
920671	*AA2-174 C*	*0.13*
920672	*AA2-174 E*	*0.74*
930401	*AB1-081 C*	*10.91*
930402	*AB1-081 E*	*4.68*
930861	*AB1-132 C*	*31.1*
930862	*AB1-132 E*	*13.33*
931231	*AB1-173 C*	*5.14*
931232	*AB1-173 E*	*2.4*
931241	*AB1-173AC*	*5.14*
931242	*AB1-173AE*	*2.4*

923911	*AB2-031 C O1*	*5.1*
923912	*AB2-031 E O1*	*2.51*
923941	*AB2-035 C*	*0.4*
923942	*AB2-035 E*	*0.17*
923991	*AB2-040 C O1*	*16.74*
923992	*AB2-040 E O1*	*13.69*
924021	*AB2-043 C O1*	*2.79*
924022	*AB2-043 E O1*	*4.58*
924151	*AB2-059 C O1*	*12.86*
924152	*AB2-059 E O1*	*6.63*
924161	*AB2-060 C O1*	*7.93*
924162	*AB2-060 E O1*	*3.73*
924301	*AB2-077 C O1*	*1.75*
924302	*AB2-077 E O1*	*1.17*
924311	*AB2-078 C O1*	*1.75*
924312	*AB2-078 E O1*	*1.17*
924321	*AB2-079 C O1*	*1.75*
924322	*AB2-079 E O1*	*1.17*
924381	*AB2-087 C*	*0.86*
924382	*AB2-087 E*	*0.4*
924391	*AB2-088 C*	*0.52*
924392	*AB2-088 E*	*0.25*
924401	*AB2-089 C*	*2.43*
924402	*AB2-089 E*	*1.25*
924411	*AB2-090 C*	*3.52*
924412	*AB2-090 E*	*1.8*

924491	*AB2-098 C*	*0.63*
924492	*AB2-098 E*	*0.27*
924501	*AB2-099 C*	*0.85*
924502	*AB2-099 E*	*0.36*
924511	*AB2-100 C*	*36.7*
924512	*AB2-100 E*	*18.08*
925171	*AB2-174 C O1*	*16.74*
925172	*AB2-174 E O1*	*15.15*
925221	*AB2-176 C*	*1.45*
925222	*AB2-176 E*	*0.62*
925591	*AC1-034 C*	*8.2*
925592	*AC1-034 E*	*6.18*
925781	*AC1-054 C*	*8.75*
925782	*AC1-054 E*	*4.03*
926071	*AC1-086 C*	*45.8*
926072	*AC1-086 E*	*20.85*
926201	*AC1-098 C*	*9.1*
926202	*AC1-098 E*	*5.42*
926211	*AC1-099 C*	*3.05*
926212	*AC1-099 E*	*1.79*
926771	*AC1-163 C*	*2.79*
926772	*AC1-163 E*	*1.3*
927021	*AC1-189 C*	*9.96*
927022	*AC1-189 E*	*4.96*
927111	*AC1-206 C*	*32.89*
927112	*AC1-206 E*	*15.55*

927141	*AC1-208 C*	*14.12*
927142	*AC1-208 E*	*6.27*

Appendix 15

(DVP - DVP) The 6EARLEYS 230/115 kV transformer (from bus 314568 to bus 314569 ckt 1) loads from 127.6% to 134.38% (**DC power flow**) of its load dump rating (208 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 2012TH4'. This project contributes approximately 14.11 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 2012TH4' /* EARLEYS
OPEN BRANCH FROM BUS 314569 TO BUS 314266 CKT 1 /* 2012
OPEN BRANCH FROM BUS 314266 TO BUS 314599 CKT 1 /* 2012
OPEN BRANCH FROM BUS 314569 TO BUS 314568 CKT 2 /* TX. #4
END

Bus Number	*Bus Name*	*Full Contribution*
315126	*1ROARAP2*	*1.31*
315128	*1ROARAP4*	*1.26*
315115	*1S HAMPT1*	*1.43*
314578	*3HORNRTN*	*2.79*
314582	*3KELFORD*	*2.21*
314603	*3SCOT NK*	*6.37*
314617	*3TUNIS*	*2.13*
314539	*3UNCAMP*	*1.47*
314541	*3WATKINS*	*0.53*
932631	*AC2-084 C*	*13.12*
932632	*AC2-084 E*	*6.46*
933461	*AC2-159 C*	*13.79*
933462	*AC2-159 E*	*13.79*
934041	*AD1-029 C*	*16.23*
934042	*AD1-029 E*	*10.7*
934201	*AD1-047 C*	*4.57*
934202	*AD1-047 E*	*3.05*

934331	*AD1-057 C O2*	*9.2*
934332	*AD1-057 E O2*	*4.91*
LTF	*CARR*	*0.02*
LTF	*CBM-S1*	*0.3*
LTF	*CBM-S2*	*0.51*
LTF	*CBM-W1*	*0.63*
LTF	*CBM-W2*	*1.59*
LTF	*CIN*	*0.15*
LTF	*CPLE*	*0.12*
LTF	*G-007*	*0.09*
LTF	*IPL*	*0.09*
LTF	*LGEE*	*0.03*
LTF	*MEC*	*0.33*
LTF	*MECS*	*0.13*
LTF	*O-066*	*0.3*
LTF	*RENSSELAER*	*0.01*
LTF	*ROSETON*	*0.11*
900671	*V4-068 C*	*0.19*
900672	*V4-068 E*	*0.53*
LTF	*WEC*	*0.04*
907092	*X1-038 E*	*3.69*
917331	*Z2-043 C*	*1.21*
917332	*Z2-043 E*	*2.65*
917342	*Z2-044 E*	*0.31*
917591	*Z2-099 C*	*0.22*
917592	*Z2-099 E*	*0.48*

918491	*AA1-063AC OP*	*1.55*
918492	*AA1-063AE OP*	*3.71*
918561	*AA1-072 C*	*0.18*
918562	*AA1-072 E*	*0.44*
919691	*AA2-053 C*	*2.35*
919692	*AA2-053 E*	*5.15*
919701	*AA2-057 C*	*1.05*
919702	*AA2-057 E*	*2.66*
919821	*AA2-068 C*	*0.46*
919822	*AA2-068 E*	*1.08*
920021	*AA2-086 C*	*0.11*
920022	*AA2-086 E*	*0.26*
920041	*AA2-088 C*	*1.35*
920042	*AA2-088 E*	*11.24*
920591	*AA2-165 C*	*0.14*
920592	*AA2-165 E*	*0.35*
920631	*AA2-169 C*	*1.18*
920632	*AA2-169 E*	*0.54*
920671	*AA2-174 C*	*0.11*
920672	*AA2-174 E*	*0.6*
931231	*AB1-173 C*	*1.29*
931232	*AB1-173 E*	*0.6*
931241	*AB1-173AC*	*1.29*
931242	*AB1-173AE*	*0.6*
923801	*AB2-015 C O1*	*6.06*
923802	*AB2-015 E O1*	*4.97*

923911	*AB2-031 C O1*	*1.28*
923912	*AB2-031 E O1*	*0.63*
923991	*AB2-040 C O1*	*4.19*
923992	*AB2-040 E O1*	*3.43*
924381	*AB2-087 C*	*1.9*
924382	*AB2-087 E*	*0.9*
924501	*AB2-099 C*	*1.74*
924502	*AB2-099 E*	*0.75*
925171	*AB2-174 C O1*	*3.65*
925172	*AB2-174 E O1*	*3.3*
926201	*AC1-098 C*	*9.21*
926202	*AC1-098 E*	*5.48*
926211	*AC1-099 C*	*3.09*
926212	*AC1-099 E*	*1.81*
926771	*AC1-163 C*	*5.74*
926772	*AC1-163 E*	*2.69*
927141	*AC1-208 C*	*8.93*
927142	*AC1-208 E*	*3.96*

Appendix 16

(DVP - DVP) The 6EARLEYS 230/115 kV transformer (from bus 314568 to bus 314569 ckt 2) loads from 116.23% to 122.42% (**DC power flow**) of its load dump rating (228 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 201262'. This project contributes approximately 14.11 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 201262' /* EARLEYS
OPEN BRANCH FROM BUS 314569 TO BUS 314266 CKT 1 /* 2012
OPEN BRANCH FROM BUS 314266 TO BUS 314599 CKT 1 /* 2012
OPEN BRANCH FROM BUS 314569 TO BUS 314568 CKT 1 /* TX. #3
END

Bus Number	*Bus Name*	*Full Contribution*
315126	*1ROARAP2*	*1.31*
315128	*1ROARAP4*	*1.26*
315115	*1S HAMPT1*	*1.43*
314578	*3HORNRTN*	*2.79*
314582	*3KELFORD*	*2.21*
314603	*3SCOT NK*	*6.37*
314617	*3TUNIS*	*2.13*
314539	*3UNCAMP*	*1.47*
314541	*3WATKINS*	*0.53*
932631	*AC2-084 C*	*13.12*
932632	*AC2-084 E*	*6.46*
933461	*AC2-159 C*	*13.79*
933462	*AC2-159 E*	*13.79*
934041	*AD1-029 C*	*16.23*
934042	*AD1-029 E*	*10.7*
934201	*AD1-047 C*	*4.57*
934202	*AD1-047 E*	*3.05*

934331	*AD1-057 C O2*	*9.2*
934332	*AD1-057 E O2*	*4.91*
LTF	*CARR*	*0.02*
LTF	*CBM-S1*	*0.3*
LTF	*CBM-S2*	*0.51*
LTF	*CBM-W1*	*0.63*
LTF	*CBM-W2*	*1.59*
LTF	*CIN*	*0.15*
LTF	*CPLE*	*0.12*
LTF	*G-007*	*0.09*
LTF	*IPL*	*0.09*
LTF	*LGEE*	*0.03*
LTF	*MEC*	*0.33*
LTF	*MECS*	*0.13*
LTF	*O-066*	*0.3*
LTF	*RENSSELAER*	*0.01*
LTF	*ROSETON*	*0.11*
900671	*V4-068 C*	*0.19*
900672	*V4-068 E*	*0.53*
LTF	*WEC*	*0.04*
907092	*X1-038 E*	*3.69*
917331	*Z2-043 C*	*1.21*
917332	*Z2-043 E*	*2.65*
917342	*Z2-044 E*	*0.31*
917591	*Z2-099 C*	*0.22*
917592	*Z2-099 E*	*0.48*

918491	*AA1-063AC OP*	*1.55*
918492	*AA1-063AE OP*	*3.71*
918561	*AA1-072 C*	*0.18*
918562	*AA1-072 E*	*0.44*
919691	*AA2-053 C*	*2.35*
919692	*AA2-053 E*	*5.15*
919701	*AA2-057 C*	*1.05*
919702	*AA2-057 E*	*2.66*
919821	*AA2-068 C*	*0.46*
919822	*AA2-068 E*	*1.08*
920021	*AA2-086 C*	*0.11*
920022	*AA2-086 E*	*0.26*
920041	*AA2-088 C*	*1.35*
920042	*AA2-088 E*	*11.24*
920591	*AA2-165 C*	*0.14*
920592	*AA2-165 E*	*0.35*
920631	*AA2-169 C*	*1.18*
920632	*AA2-169 E*	*0.54*
920671	*AA2-174 C*	*0.11*
920672	*AA2-174 E*	*0.6*
931231	*AB1-173 C*	*1.29*
931232	*AB1-173 E*	*0.6*
931241	*AB1-173AC*	*1.29*
931242	*AB1-173AE*	*0.6*
923801	*AB2-015 C O1*	*6.06*
923802	*AB2-015 E O1*	*4.97*

923911	*AB2-031 C O1*	*1.28*
923912	*AB2-031 E O1*	*0.63*
923991	*AB2-040 C O1*	*4.19*
923992	*AB2-040 E O1*	*3.43*
924381	*AB2-087 C*	*1.9*
924382	*AB2-087 E*	*0.9*
924501	*AB2-099 C*	*1.74*
924502	*AB2-099 E*	*0.75*
925171	*AB2-174 C O1*	*3.65*
925172	*AB2-174 E O1*	*3.3*
926201	*AC1-098 C*	*9.21*
926202	*AC1-098 E*	*5.48*
926211	*AC1-099 C*	*3.09*
926212	*AC1-099 E*	*1.81*
926771	*AC1-163 C*	*5.74*
926772	*AC1-163 E*	*2.69*
927141	*AC1-208 C*	*8.93*
927142	*AC1-208 E*	*3.96*

Appendix 17

(DVP - CPLE) The 6EVERETS-6GREENVILE T 230 kV line (from bus 314574 to bus 304451 ckt 1) loads from 118.89% to 119.79% (**DC power flow**) of its emergency rating (478 MVA) for the tower line contingency outage of 'DVP_P7-1: LN 2058-2181'. This project contributes approximately 9.5 MW to the thermal violation.

CONTINGENCY 'DVP_P7-1: LN 2058-2181'
OPEN BRANCH FROM BUS 304222 TO BUS 313845 CKT 1 /* 6ROCKYMT230T230.00 - 6HATHAWAY 230.00
OPEN BUS 304226 /* ISLAND: 6PA-RMOUNT#4115.00
OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00
OPEN BRANCH FROM BUS 313845 TO BUS 314591 CKT 1 /* 6HATHAWAY 230.00 - 6NASH 230.00
OPEN BUS 314591 /* ISLAND: 6NASH 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*3.12*
315292	*1DOMTR78*	*2.11*
315293	*1DOMTR9*	*1.72*
315131	*1EDGECMA*	*9.28*
315132	*1EDGECMB*	*9.28*
315136	*1ROSEMG1*	*1.98*
315138	*1ROSEMG2*	*0.93*
315137	*1ROSEMS1*	*1.23*
314557	*3BETHELC*	*1.14*
314554	*3BTLEBRO*	*0.43*
314566	*3CRESWEL*	*2.04*
314572	*3EMPORIA*	*0.21*
314578	*3HORNRTN*	*2.04*
314582	*3KELFORD*	*0.72*

314603	*3SCOT NK*	*2.51*
314617	*3TUNIS*	*0.7*
314539	*3UNCAMP*	*1.18*
314541	*3WATKINS*	*0.36*
314620	*6CASHIE*	*0.88*
314574	*6EVERETS*	*5.39*
314594	*6PLYMOTH*	*0.83*
314648	*6SUNBURY*	*0.4*
314651	*6WINFALL*	*0.97*
932631	*AC2-084 C*	*6.16*
932632	*AC2-084 E*	*3.04*
933451	*AC2-158 C*	*5.87*
933452	*AC2-158 E*	*5.87*
933461	*AC2-159 C*	*5.22*
933462	*AC2-159 E*	*5.22*
933711	*AC2-194 C*	*0.6*
933712	*AC2-194 E*	*0.97*
933991	*AD1-023 C*	*13.46*
933992	*AD1-023 E*	*7.33*
934041	*AD1-029 C*	*7.62*
934042	*AD1-029 E*	*5.02*
934201	*AD1-047 C*	*4.28*
934202	*AD1-047 E*	*2.86*
934331	*AD1-057 C O2*	*6.19*
934332	*AD1-057 E O2*	*3.3*
934521	*AD1-076 C O2*	*73.5*

934522	*AD1-076 E O2*	*37.43*
LTF	*AMIL*	*0.48*
LTF	*BAYOU*	*2.64*
LTF	*BIG_CAJUN1*	*4.17*
LTF	*BIG_CAJUN2*	*8.39*
LTF	*BLUEG*	*2.5*
LTF	*CALDERWOOD*	*1.54*
LTF	*CANNELTON*	*0.48*
LTF	*CATAWBA*	*1.51*
LTF	*CBM-N*	*< 0.01*
LTF	*CELEVELAND*	*4.27*
LTF	*CHEOAH*	*1.44*
LTF	*CHILHOWEE*	*0.5*
LTF	*CHOCTAW*	*2.84*
LTF	*CLIFTY*	*9.05*
LTF	*COTTONWOOD*	*10.33*
LTF	*DEARBORN*	*0.89*
LTF	*EDWARDS*	*0.78*
LTF	*ELMERSMITH*	*1.42*
LTF	*FARMERCITY*	*0.62*
LTF	*G-007A*	*1.03*
LTF	*GIBSON*	*0.88*
LTF	*HAMLET*	*6.47*
LTF	*MORGAN*	*4.57*
LTF	*NEWTON*	*2.15*
LTF	*NYISO*	*0.09*

LTF	*O-066A*	*0.47*
LTF	*PRAIRIE*	*4.69*
LTF	*ROWAN*	*2.99*
LTF	*SANTEETLA*	*0.43*
LTF	*SMITHLAND*	*0.42*
LTF	*TATANKA*	*1.05*
LTF	*TILTON*	*0.92*
LTF	*TRIMBLE*	*0.47*
LTF	*TVA*	*1.92*
LTF	*UNIONPOWER*	*2.74*
900672	*V4-068 E*	*0.21*
LTF	*VFT*	*2.75*
901082	*W1-029E*	*23.36*
907092	*X1-038 E*	*2.96*
LTF	*X1-078*	*0.8*
913392	*Y1-086 E*	*1.05*
916042	*Z1-036 E*	*29.11*
917122	*Z2-027 E*	*0.51*
917331	*Z2-043 C*	*0.39*
917332	*Z2-043 E*	*0.86*
917342	*Z2-044 E*	*0.33*
917511	*Z2-088 C OP1*	*1.52*
917512	*Z2-088 E OP1*	*6.13*
917592	*Z2-099 E*	*0.26*
918411	*AA1-050*	*1.28*
918492	*AA1-063AE OP*	*2.44*

918511	*AA1-065 C OP*	*1.93*
918512	*AA1-065 E OP*	*4.84*
918531	*AA1-067 C*	*0.74*
918532	*AA1-067 E*	*1.62*
918561	*AA1-072 C*	*0.06*
918562	*AA1-072 E*	*0.14*
919692	*AA2-053 E*	*2.58*
919702	*AA2-057 E*	*2.12*
919732	*AA2-059 E*	*0.38*
919822	*AA2-068 E*	*0.66*
920022	*AA2-086 E*	*0.14*
920042	*AA2-088 E*	*6.24*
920592	*AA2-165 E*	*0.28*
920672	*AA2-174 E*	*0.3*
920691	*AA2-178 C*	*8.16*
920692	*AA2-178 E*	*3.5*
930051	*AB1-013 C*	*2.46*
930052	*AB1-013 E*	*16.47*
930401	*AB1-081 C*	*5.63*
930402	*AB1-081 E*	*2.41*
930861	*AB1-132 C*	*10.35*
930862	*AB1-132 E*	*4.44*
931231	*AB1-173 C*	*1.2*
931232	*AB1-173 E*	*0.56*
931241	*AB1-173AC*	*1.2*
931242	*AB1-173AE*	*0.56*

923801	*AB2-015 C O1*	*4.39*
923802	*AB2-015 E O1*	*3.6*
923831	*AB2-022 C*	*1.02*
923832	*AB2-022 E*	*0.55*
923911	*AB2-031 C O1*	*1.2*
923912	*AB2-031 E O1*	*0.59*
923941	*AB2-035 C*	*0.48*
923942	*AB2-035 E*	*0.21*
923991	*AB2-040 C O1*	*3.93*
923992	*AB2-040 E O1*	*3.21*
924151	*AB2-059 C O1*	*6.64*
924152	*AB2-059 E O1*	*3.42*
924381	*AB2-087 C*	*0.54*
924382	*AB2-087 E*	*0.26*
924391	*AB2-088 C*	*0.62*
924392	*AB2-088 E*	*0.3*
924491	*AB2-098 C*	*1.26*
924492	*AB2-098 E*	*0.54*
924501	*AB2-099 C*	*0.53*
924502	*AB2-099 E*	*0.23*
924511	*AB2-100 C*	*5.85*
924512	*AB2-100 E*	*2.88*
925121	*AB2-169 C*	*10.01*
925122	*AB2-169 E*	*8.99*
925171	*AB2-174 C O1*	*3.64*
925172	*AB2-174 E O1*	*3.29*

925281	*AB2-186 C*	*0.37*
925282	*AB2-186 E*	*0.16*
925291	*AB2-188 C O1*	*2.01*
925292	*AB2-188 E O1*	*0.9*
925591	*AC1-034 C*	*9.79*
925592	*AC1-034 E*	*7.38*
926071	*AC1-086 C*	*15.24*
926072	*AC1-086 E*	*6.94*
926201	*AC1-098 C*	*4.32*
926202	*AC1-098 E*	*2.58*
926211	*AC1-099 C*	*1.45*
926212	*AC1-099 E*	*0.85*
LTF	*AC1-133*	*22.49*
926771	*AC1-163 C*	*1.74*
926772	*AC1-163 E*	*0.81*
927021	*AC1-189 C*	*15.45*
927022	*AC1-189 E*	*7.7*
927111	*AC1-206 C*	*4.78*
927112	*AC1-206 E*	*2.26*
927141	*AC1-208 C*	*5.74*
927142	*AC1-208 E*	*2.55*

Appendix 18

(DVP - DVP) The 3COX DP-3CHESTNUT 115 kV line (from bus 314577 to bus 313719 ckt 1) loads from 148.86% to 181.07% (**DC power flow**) of its load dump rating (174 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 5602'. This project contributes approximately 58.26 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 5602' /* CAROLINA 115 KV
OPEN BRANCH FROM BUS 313723 TO BUS 314604 CKT 1 /* 3PECAN 115.00 - 3SEABORD 115.00
OPEN BRANCH FROM BUS 314558 TO BUS 314587 CKT 1 /* 3BOYKINS 115.00 - 3MARGTSV 115.00
OPEN BRANCH FROM BUS 314587 TO BUS 314604 CKT 1 /* 3MARGTSV 115.00 - 3SEABORD 115.00
OPEN BUS 314587 /* ISLAND: 3MARGTSV 115.00
OPEN BUS 314604 /* ISLAND: 3SEABORD 115.00
OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00
OPEN BRANCH FROM BUS 314559 TO BUS 919690 CKT 1 /* 3CAROLNA 115.00 - AA2-053 TAP 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

Bus Number	*Bus Name*	*Full Contribution*
315126	*1ROARAP2*	*3.85*
315128	*1ROARAP4*	*3.71*
314578	*3HORNRTN*	*8.39*
314582	*3KELFORD*	*1.13*
314603	*3SCOT NK*	*7.6*
932631	*AC2-084 C*	*25.36*
932632	*AC2-084 E*	*12.49*
934041	*AD1-029 C*	*31.37*
934042	*AD1-029 E*	*20.68*
934231	*AD1-050 C*	*3.78*

934232	*AD1-050 E*	*2.07*
934331	*AD1-057 C O2*	*37.99*
934332	*AD1-057 E O2*	*20.27*
LTF	*AMIL*	*0.07*
LTF	*BAYOU*	*0.35*
LTF	*BIG_CAJUN1*	*0.55*
LTF	*BIG_CAJUN2*	*1.11*
LTF	*BLUEG*	*0.34*
LTF	*CALDERWOOD*	*0.2*
LTF	*CANNELTON*	*0.07*
LTF	*CARR*	*0.01*
LTF	*CATAWBA*	*0.2*
LTF	*CELEVELAND*	*0.57*
LTF	*CHEOAH*	*0.19*
LTF	*CHILHOWEE*	*0.07*
LTF	*CHOCTAW*	*0.38*
LTF	*CLIFTY*	*1.26*
LTF	*COTTONWOOD*	*1.37*
LTF	*DEARBORN*	*0.13*
LTF	*EDWARDS*	*0.11*
LTF	*ELMERSMITH*	*0.19*
LTF	*FARMERCITY*	*0.08*
LTF	*G-007A*	*0.02*
LTF	*GIBSON*	*0.12*
LTF	*HAMLET*	*0.86*
LTF	*MORGAN*	*0.61*

LTF	*NEWTON*	*0.29*
LTF	*O-066A*	*< 0.01*
LTF	*PRAIRIE*	*0.64*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.07*
LTF	*ROWAN*	*0.4*
LTF	*SANTEETLA*	*0.06*
LTF	*SMITHLAND*	*0.06*
LTF	*TATANKA*	*0.14*
LTF	*TILTON*	*0.13*
LTF	*TRIMBLE*	*0.07*
LTF	*TVA*	*0.25*
LTF	*UNIONPOWER*	*0.36*
LTF	*VFT*	*0.05*
LTF	*X1-078*	*0.02*
917331	*Z2-043 C*	*0.62*
917332	*Z2-043 E*	*1.35*
918491	*AA1-063AC OP*	*3.95*
918492	*AA1-063AE OP*	*9.48*
918561	*AA1-072 C*	*0.09*
918562	*AA1-072 E*	*0.23*
919821	*AA2-068 C*	*1.52*
919822	*AA2-068 E*	*3.57*
920631	*AA2-169 C*	*2.83*
920632	*AA2-169 E*	*1.3*
924401	*AB2-089 C*	*1.72*

924402	*AB2-089 E*	*0.88*
926201	*AC1-098 C*	*17.79*
926202	*AC1-098 E*	*10.6*
926211	*AC1-099 C*	*5.96*
926212	*AC1-099 E*	*3.5*
927141	*AC1-208 C*	*28.81*
927142	*AC1-208 E*	*12.79*

Appendix 19

(DVP - DVP) The 3HORNRTN-3CAROLNA 115 kV line (from bus 314578 to bus 314559 ckt 1) loads from 118.33% to 148.16% (**DC power flow**) of its load dump rating (202 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 8042'. This project contributes approximately 60.27 MW to the thermal violation.

```
CONTINGENCY 'DVP_P4-2: 8042'                    /* BATTLEBORO
  OPEN BUS 314554                               /*BATTLEBORO 115KV BUS
  OPEN BUS 314556                               /*LINE 80
  OPEN BUS 314567                               /*LINE 80
  OPEN BUS 314205                               /*LINE 80
  OPEN BUS 314834                               /*BATTLEBORO 115KV CAP
  END
```

Bus Number	*Bus Name*	*Full Contribution*
314578	*3HORNRTN*	*18.06*
314582	*3KELFORD*	*1.21*
314603	*3SCOT NK*	*8.46*
932631	*AC2-084 C*	*28.52*
932632	*AC2-084 E*	*14.05*
934041	*AD1-029 C*	*35.27*
934042	*AD1-029 E*	*23.25*
934331	*AD1-057 C O2*	*39.3*
934332	*AD1-057 E O2*	*20.96*
LTF	*AMIL*	*0.01*
LTF	*BAYOU*	*0.04*
LTF	*BIG_CAJUN1*	*0.06*
LTF	*BIG_CAJUN2*	*0.12*
LTF	*BLUEG*	*0.06*
LTF	*CALDERWOOD*	*0.02*
LTF	*CANNELTON*	*0.01*

LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*0.02*
LTF	*CELEVELAND*	*0.05*
LTF	*CHEOAH*	*0.02*
LTF	*CHILHOWEE*	*< 0.01*
LTF	*CHOCTAW*	*0.04*
LTF	*CLIFTY*	*0.24*
LTF	*COTTONWOOD*	*0.15*
LTF	*DEARBORN*	*0.03*
LTF	*EDWARDS*	*0.02*
LTF	*ELMERSMITH*	*0.03*
LTF	*FARMERCITY*	*0.01*
LTF	*G-007*	*0.01*
LTF	*GIBSON*	*0.02*
LTF	*HAMLET*	*0.04*
LTF	*MORGAN*	*0.07*
LTF	*NEWTON*	*0.05*
LTF	*O-066*	*0.04*
LTF	*PRAIRIE*	*0.09*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.03*
LTF	*ROWAN*	*0.04*
LTF	*SANTEETLA*	*< 0.01*
LTF	*SMITHLAND*	*< 0.01*
LTF	*TATANKA*	*0.02*
LTF	*TILTON*	*0.02*

LTF	*TRIMBLE*	*0.01*
LTF	*TVA*	*0.03*
LTF	*UNIONPOWER*	*0.03*
917331	*Z2-043 C*	*0.66*
917332	*Z2-043 E*	*1.45*
917341	*Z2-044 C*	*1.06*
917342	*Z2-044 E*	*2.31*
918561	*AA1-072 C*	*0.1*
918562	*AA1-072 E*	*0.24*
919701	*AA2-057 C*	*5.54*
919702	*AA2-057 E*	*14.1*
919821	*AA2-068 C*	*1.72*
919822	*AA2-068 E*	*4.04*
920591	*AA2-165 C*	*0.76*
920592	*AA2-165 E*	*1.86*
926201	*AC1-098 C*	*20.01*
926202	*AC1-098 E*	*11.92*
926211	*AC1-099 C*	*6.7*
926212	*AC1-099 E*	*3.94*
927141	*AC1-208 C*	*40.1*
927142	*AC1-208 E*	*17.8*

Appendix 20

(DVP - DVP) The 3KELFORD-3EARLEYS 115 kV line (from bus 314582 to bus 314568 ckt 1) loads from 223.7% to 277.41% (**DC power flow**) of its load dump rating (175 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 8142'. This project contributes approximately 93.99 MW to the thermal violation.

```
CONTINGENCY 'DVP_P4-2: 8142'                    /* BATTLEBORO
  OPEN BUS 314554                               /*BATTLEBORO 115KV BUS
  OPEN BUS 314556                               /*LINE 80
  OPEN BUS 314567                               /*LINE 80
  OPEN BUS 314205                               /*LINE 80
  OPEN BUS 314834                               /*BATTLEBORO 115KV CAP
  OPEN BUS 314623                               /*LINE 81
  OPEN BUS 314577                               /*LINE 81
  OPEN BUS 314628                               /*LINE 81
  OPEN BUS 314598                               /*LINE 81
  OPEN BUS 314578                               /*LINE 81
  END
```

Bus Number	*Bus Name*	*Full Contribution*
314582	*3KELFORD*	*5.*
314603	*3SCOT NK*	*20.*
932631	*AC2-084 C*	*53.59*
932632	*AC2-084 E*	*26.4*
934041	*AD1-029 C*	*66.29*
934042	*AD1-029 E*	*43.69*
934331	*AD1-057 C O2*	*61.29*
934332	*AD1-057 E O2*	*32.7*
LTF	*AMIL*	*< 0.01*
LTF	*BAYOU*	*0.02*
LTF	*BIG_CAJUN1*	*0.02*
LTF	*BIG_CAJUN2*	*0.05*
LTF	*BLUEG*	*0.03*

LTF	*CALDERWOOD*	*< 0.01*
LTF	*CANNELTON*	*< 0.01*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*< 0.01*
LTF	*CELEVELAND*	*0.02*
LTF	*CHEOAH*	*< 0.01*
LTF	*CHILHOWEE*	*< 0.01*
LTF	*CHOCTAW*	*0.02*
LTF	*CLIFTY*	*0.11*
LTF	*COTTONWOOD*	*0.06*
LTF	*DEARBORN*	*0.01*
LTF	*EDWARDS*	*< 0.01*
LTF	*ELMERSMITH*	*0.01*
LTF	*FARMERCITY*	*< 0.01*
LTF	*G-007*	*0.02*
LTF	*GIBSON*	*< 0.01*
LTF	*HAMLET*	*0.02*
LTF	*MORGAN*	*0.03*
LTF	*NEWTON*	*0.02*
LTF	*O-066*	*0.05*
LTF	*PRAIRIE*	*0.04*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.03*
LTF	*ROWAN*	*0.01*
LTF	*SANTEETLA*	*< 0.01*
LTF	*SMITHLAND*	*< 0.01*

LTF	*TATANKA*	*< 0.01*
LTF	*TILTON*	*< 0.01*
LTF	*TRIMBLE*	*< 0.01*
LTF	*TVA*	*0.01*
LTF	*UNIONPOWER*	*0.01*
917331	*Z2-043 C*	*2.75*
917332	*Z2-043 E*	*6.*
918561	*AA1-072 C*	*0.41*
918562	*AA1-072 E*	*1.*
919821	*AA2-068 C*	*2.69*
919822	*AA2-068 E*	*6.3*
926201	*AC1-098 C*	*37.59*
926202	*AC1-098 E*	*22.4*
926211	*AC1-099 C*	*12.6*
926212	*AC1-099 E*	*7.4*
927141	*AC1-208 C*	*55.39*
927142	*AC1-208 E*	*24.6*

Appendix 21

(DVP - DVP) The 6LAKEVEW-AB2-100 TAP 230 kV line (from bus 314583 to bus 924510 ckt 1) loads from 113.81% to 117.3% (**DC power flow**) of its load dump rating (459 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 246T247'. This project contributes approximately 16.01 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 246T247' /* SUFFOLK 230 KV
OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* 6SUFFOLK 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00
OPEN BUS 314575 /* ISLAND: 6NUCO TP 230.00
OPEN BUS 314590 /* ISLAND: 6NUCOR 230.00
OPEN BRANCH FROM BUS 314537 TO BUS 314648 CKT 1 /* 6SUFFOLK 230.00 - 6SUNBURY 230.00
OPEN BRANCH FROM BUS 314648 TO BUS 901080 CKT 1 /* 6SUNBURY 230.00 - W1-029 230.00
OPEN BUS 314648 /* ISLAND: 6SUNBURY 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*2.12*
315131	*1EDGECMA*	*10.48*
315132	*1EDGECMB*	*10.48*
315139	*1GASTONA*	*7.94*
315141	*1GASTONB*	*7.94*
315126	*1ROARAP2*	*1.63*
315128	*1ROARAP4*	*1.57*
315136	*1ROSEMG1*	*5.33*
315138	*1ROSEMG2*	*2.5*
315137	*1ROSEMS1*	*3.31*
314557	*3BETHELC*	*0.87*

314554	*3BTLEBRO*	*0.84*
314566	*3CRESWEL*	*1.64*
314578	*3HORNRTN*	*3.35*
314582	*3KELFORD*	*0.91*
314603	*3SCOT NK*	*3.55*
314617	*3TUNIS*	*0.81*
314541	*3WATKINS*	*0.32*
314620	*6CASHIE*	*0.83*
314574	*6EVERETS*	*2.43*
314594	*6PLYMOTH*	*0.69*
932631	*AC2-084 C*	*9.33*
932632	*AC2-084 E*	*4.6*
933451	*AC2-158 C*	*6.16*
933452	*AC2-158 E*	*6.16*
933461	*AC2-159 C*	*7.09*
933462	*AC2-159 E*	*7.09*
933991	*AD1-023 C*	*11.95*
933992	*AD1-023 E*	*6.5*
934041	*AD1-029 C*	*11.54*
934042	*AD1-029 E*	*7.61*
934331	*AD1-057 C O2*	*10.44*
934332	*AD1-057 E O2*	*5.57*
934521	*AD1-076 C O2*	*47.33*
934522	*AD1-076 E O2*	*24.1*
LTF	*AD1-120*	*3.75*
LTF	*AD1-121*	*3.72*

LTF	*CARR*	*0.09*
LTF	*CBM-S1*	*4.51*
LTF	*CBM-S2*	*9.28*
LTF	*CBM-W1*	*9.81*
LTF	*CBM-W2*	*24.32*
LTF	*CIN*	*2.2*
LTF	*CPLE*	*3.18*
LTF	*G-007*	*0.61*
LTF	*IPL*	*1.4*
LTF	*LGEE*	*0.47*
LTF	*MEC*	*4.99*
LTF	*MECS*	*2.2*
LTF	*O-066*	*2.02*
LTF	*RENSSELAER*	*0.08*
LTF	*ROSETON*	*0.55*
900672	*V4-068 E*	*0.24*
LTF	*WEC*	*0.61*
916042	*Z1-036 E*	*21.81*
917331	*Z2-043 C*	*0.5*
917332	*Z2-043 E*	*1.1*
917341	*Z2-044 C*	*0.28*
917342	*Z2-044 E*	*0.61*
917511	*Z2-088 C OP1*	*1.02*
917512	*Z2-088 E OP1*	*4.12*
917592	*Z2-099 E*	*0.3*
918411	*AA1-050*	*0.86*

918491	*AA1-063AC OP*	*1.46*
918492	*AA1-063AE OP*	*3.51*
918511	*AA1-065 C OP*	*2.13*
918512	*AA1-065 E OP*	*5.34*
918531	*AA1-067 C*	*0.33*
918532	*AA1-067 E*	*0.73*
918561	*AA1-072 C*	*0.08*
918562	*AA1-072 E*	*0.18*
919691	*AA2-053 C*	*1.76*
919692	*AA2-053 E*	*3.86*
919701	*AA2-057 C*	*1.46*
919702	*AA2-057 E*	*3.73*
919732	*AA2-059 E*	*0.29*
919821	*AA2-068 C*	*0.46*
919822	*AA2-068 E*	*1.08*
LTF	*AA2-074*	*2.16*
920022	*AA2-086 E*	*0.16*
920042	*AA2-088 E*	*6.95*
920591	*AA2-165 C*	*0.2*
920592	*AA2-165 E*	*0.49*
920631	*AA2-169 C*	*1.37*
920632	*AA2-169 E*	*0.63*
920671	*AA2-174 C*	*0.08*
920672	*AA2-174 E*	*0.45*
920691	*AA2-178 C*	*6.54*
920692	*AA2-178 E*	*2.8*

930051	*AB1-013 C*	*1.97*
930052	*AB1-013 E*	*13.21*
930401	*AB1-081 C*	*9.53*
930402	*AB1-081 E*	*4.08*
930861	*AB1-132 C*	*30.89*
930862	*AB1-132 E*	*13.24*
923941	*AB2-035 C*	*0.37*
923942	*AB2-035 E*	*0.16*
924151	*AB2-059 C O1*	*11.23*
924152	*AB2-059 E O1*	*5.78*
924381	*AB2-087 C*	*0.64*
924382	*AB2-087 E*	*0.3*
924391	*AB2-088 C*	*0.47*
924392	*AB2-088 E*	*0.23*
924491	*AB2-098 C*	*0.57*
924492	*AB2-098 E*	*0.24*
924501	*AB2-099 C*	*0.61*
924502	*AB2-099 E*	*0.26*
925121	*AB2-169 C*	*5.87*
925122	*AB2-169 E*	*5.27*
925291	*AB2-188 C O1*	*1.61*
925292	*AB2-188 E O1*	*0.72*
925591	*AC1-034 C*	*7.44*
925592	*AC1-034 E*	*5.62*
925781	*AC1-054 C*	*3.71*
925782	*AC1-054 E*	*1.71*

926071	*AC1-086 C*	*45.49*
926072	*AC1-086 E*	*20.7*
926201	*AC1-098 C*	*6.55*
926202	*AC1-098 E*	*3.9*
926211	*AC1-099 C*	*2.19*
926212	*AC1-099 E*	*1.29*
926771	*AC1-163 C*	*2.03*
926772	*AC1-163 E*	*0.95*
927021	*AC1-189 C*	*9.*
927022	*AC1-189 E*	*4.48*
927141	*AC1-208 C*	*9.41*
927142	*AC1-208 E*	*4.18*

Appendix 22

(DVP - DVP) The 3ROAN DP-3HORNRTN 115 kV line (from bus 314598 to bus 314578 ckt 1) loads from 114.34% to 144.18% (**DC power flow**) of its load dump rating (202 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 12342'. This project contributes approximately 60.27 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 12342' /*BATTLEBORO
OPEN BUS 314554 /*BATTLEBORO 115KV BUS
OPEN BUS 314834 /*BATTLEBORO 115KV CAP
END

Bus Number	*Bus Name*	*Full Contribution*
314582	*3KELFORD*	*1.21*
314603	*3SCOT NK*	*8.46*
932631	*AC2-084 C*	*28.52*
932632	*AC2-084 E*	*14.05*
934041	*AD1-029 C*	*35.27*
934042	*AD1-029 E*	*23.25*
934331	*AD1-057 C O2*	*39.3*
934332	*AD1-057 E O2*	*20.96*
LTF	*AMIL*	*0.01*
LTF	*BAYOU*	*0.04*
LTF	*BIG_CAJUN1*	*0.06*
LTF	*BIG_CAJUN2*	*0.12*
LTF	*BLUEG*	*0.06*
LTF	*CALDERWOOD*	*0.02*
LTF	*CANNELTON*	*0.01*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*0.02*
LTF	*CELEVELAND*	*0.05*

LTF	*CHEOAH*	*0.02*
LTF	*CHILHOWEE*	*< 0.01*
LTF	*CHOCTAW*	*0.04*
LTF	*CLIFTY*	*0.24*
LTF	*COTTONWOOD*	*0.15*
LTF	*DEARBORN*	*0.03*
LTF	*EDWARDS*	*0.02*
LTF	*ELMERSMITH*	*0.03*
LTF	*FARMERCITY*	*0.01*
LTF	*G-007*	*0.01*
LTF	*GIBSON*	*0.02*
LTF	*HAMLET*	*0.04*
LTF	*MORGAN*	*0.07*
LTF	*NEWTON*	*0.05*
LTF	*O-066*	*0.04*
LTF	*PRAIRIE*	*0.09*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.03*
LTF	*ROWAN*	*0.04*
LTF	*SANTEETLA*	*< 0.01*
LTF	*SMITHLAND*	*< 0.01*
LTF	*TATANKA*	*0.02*
LTF	*TILTON*	*0.02*
LTF	*TRIMBLE*	*0.01*
LTF	*TVA*	*0.03*
LTF	*UNIONPOWER*	*0.03*

917331	*Z2-043 C*	*0.66*
917332	*Z2-043 E*	*1.45*
917341	*Z2-044 C*	*1.06*
917342	*Z2-044 E*	*2.31*
918561	*AA1-072 C*	*0.1*
918562	*AA1-072 E*	*0.24*
919701	*AA2-057 C*	*5.54*
919702	*AA2-057 E*	*14.1*
919821	*AA2-068 C*	*1.72*
919822	*AA2-068 E*	*4.04*
920591	*AA2-165 C*	*0.76*
920592	*AA2-165 E*	*1.86*
926201	*AC1-098 C*	*20.01*
926202	*AC1-098 E*	*11.92*
926211	*AC1-099 C*	*6.7*
926212	*AC1-099 E*	*3.94*
927141	*AC1-208 C*	*40.1*
927142	*AC1-208 E*	*17.8*

Appendix 23

(DVP - DVP) The 3SAMS HD-3KELFORD 115 kV line (from bus 314602 to bus 314582 ckt 1) loads from 215.03% to 269.05% (**DC power flow**) of its load dump rating (174 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 8142'. This project contributes approximately 93.99 MW to the thermal violation.

```
CONTINGENCY 'DVP_P4-2: 8142'                    /* BATTLEBORO
  OPEN BUS 314554                               /*BATTLEBORO 115KV BUS
  OPEN BUS 314556                               /*LINE 80
  OPEN BUS 314567                               /*LINE 80
  OPEN BUS 314205                               /*LINE 80
  OPEN BUS 314834                               /*BATTLEBORO 115KV CAP
  OPEN BUS 314623                               /*LINE 81
  OPEN BUS 314577                               /*LINE 81
  OPEN BUS 314628                               /*LINE 81
  OPEN BUS 314598                               /*LINE 81
  OPEN BUS 314578                               /*LINE 81
  END
```

Bus Number	*Bus Name*	*Full Contribution*
314603	*3SCOT NK*	*20.*
932631	*AC2-084 C*	*53.6*
932632	*AC2-084 E*	*26.4*
934041	*AD1-029 C*	*66.3*
934042	*AD1-029 E*	*43.7*
934331	*AD1-057 C O2*	*61.3*
934332	*AD1-057 E O2*	*32.7*
LTF	*AMIL*	*< 0.01*
LTF	*BAYOU*	*< 0.01*
LTF	*BIG_CAJUN1*	*0.01*
LTF	*BIG_CAJUN2*	*0.02*
LTF	*BLUEG*	*0.01*
LTF	*CALDERWOOD*	*< 0.01*

LTF	*CANNELTON*	*< 0.01*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*< 0.01*
LTF	*CELEVELAND*	*< 0.01*
LTF	*CHEOAH*	*< 0.01*
LTF	*CHILHOWEE*	*< 0.01*
LTF	*CHOCTAW*	*< 0.01*
LTF	*CLIFTY*	*0.05*
LTF	*COTTONWOOD*	*0.03*
LTF	*DEARBORN*	*< 0.01*
LTF	*EDWARDS*	*< 0.01*
LTF	*ELMERSMITH*	*< 0.01*
LTF	*FARMERCITY*	*< 0.01*
LTF	*G-007*	*< 0.01*
LTF	*GIBSON*	*< 0.01*
LTF	*HAMLET*	*< 0.01*
LTF	*MORGAN*	*0.01*
LTF	*NEWTON*	*< 0.01*
LTF	*O-066*	*0.02*
LTF	*PRAIRIE*	*0.02*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.01*
LTF	*ROWAN*	*< 0.01*
LTF	*SANTEETLA*	*< 0.01*
LTF	*SMITHLAND*	*< 0.01*
LTF	*TATANKA*	*< 0.01*

LTF	*TILTON*	*< 0.01*
LTF	*TRIMBLE*	*< 0.01*
LTF	*TVA*	*< 0.01*
LTF	*UNIONPOWER*	*< 0.01*
919821	*AA2-068 C*	*2.69*
919822	*AA2-068 E*	*6.3*
926201	*AC1-098 C*	*37.6*
926202	*AC1-098 E*	*22.4*
926211	*AC1-099 C*	*12.6*
926212	*AC1-099 E*	*7.4*
927141	*AC1-208 C*	*55.4*
927142	*AC1-208 E*	*24.6*

Appendix 24

(DVP - DVP) The 3SCOT NK-3SAMS HD 115 kV line (from bus 314603 to bus 314602 ckt 1) loads from 216.18% to 270.2% (**DC power flow**) of its load dump rating (174 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 8142'. This project contributes approximately 93.99 MW to the thermal violation.

```
CONTINGENCY 'DVP_P4-2: 8142'                    /* BATTLEBORO
  OPEN BUS 314554                               /*BATTLEBORO 115KV BUS
  OPEN BUS 314556                               /*LINE 80
  OPEN BUS 314567                               /*LINE 80
  OPEN BUS 314205                               /*LINE 80
  OPEN BUS 314834                               /*BATTLEBORO 115KV CAP
  OPEN BUS 314623                               /*LINE 81
  OPEN BUS 314577                               /*LINE 81
  OPEN BUS 314628                               /*LINE 81
  OPEN BUS 314598                               /*LINE 81
  OPEN BUS 314578                               /*LINE 81
  END
```

Bus Number	*Bus Name*	*Full Contribution*
314603	*3SCOT NK*	*20.*
932631	*AC2-084 C*	*53.6*
932632	*AC2-084 E*	*26.4*
934041	*AD1-029 C*	*66.3*
934042	*AD1-029 E*	*43.7*
934331	*AD1-057 C O2*	*61.3*
934332	*AD1-057 E O2*	*32.7*
LTF	*AMIL*	*< 0.01*
LTF	*BAYOU*	*< 0.01*
LTF	*BIG_CAJUN1*	*0.01*
LTF	*BIG_CAJUN2*	*0.02*
LTF	*BLUEG*	*0.01*
LTF	*CALDERWOOD*	*< 0.01*

LTF	*CANNELTON*	*< 0.01*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*< 0.01*
LTF	*CELEVELAND*	*< 0.01*
LTF	*CHEOAH*	*< 0.01*
LTF	*CHILHOWEE*	*< 0.01*
LTF	*CHOCTAW*	*< 0.01*
LTF	*CLIFTY*	*0.05*
LTF	*COTTONWOOD*	*0.03*
LTF	*DEARBORN*	*< 0.01*
LTF	*EDWARDS*	*< 0.01*
LTF	*ELMERSMITH*	*< 0.01*
LTF	*FARMERCITY*	*< 0.01*
LTF	*G-007*	*< 0.01*
LTF	*GIBSON*	*< 0.01*
LTF	*HAMLET*	*< 0.01*
LTF	*MORGAN*	*0.01*
LTF	*NEWTON*	*< 0.01*
LTF	*O-066*	*0.02*
LTF	*PRAIRIE*	*0.02*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.01*
LTF	*ROWAN*	*< 0.01*
LTF	*SANTEETLA*	*< 0.01*
LTF	*SMITHLAND*	*< 0.01*
LTF	*TATANKA*	*< 0.01*

LTF	*TILTON*	*< 0.01*
LTF	*TRIMBLE*	*< 0.01*
LTF	*TVA*	*< 0.01*
LTF	*UNIONPOWER*	*< 0.01*
919821	*AA2-068 C*	*2.69*
919822	*AA2-068 E*	*6.3*
926201	*AC1-098 C*	*37.6*
926202	*AC1-098 E*	*22.4*
926211	*AC1-099 C*	*12.6*
926212	*AC1-099 E*	*7.4*
927141	*AC1-208 C*	*55.4*
927142	*AC1-208 E*	*24.6*

Appendix 25

(DVP - DVP) The 3WITAKRS-3BTLEBRO 115 kV line (from bus 314623 to bus 314554 ckt 1) loads from 186.55% to 220.01% (**DC power flow**) of its load dump rating (174 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 5602'. This project contributes approximately 58.23 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 5602' /* CAROLINA 115 KV
OPEN BRANCH FROM BUS 313723 TO BUS 314604 CKT 1 /* 3PECAN 115.00 - 3SEABORD 115.00
OPEN BRANCH FROM BUS 314558 TO BUS 314587 CKT 1 /* 3BOYKINS 115.00 - 3MARGTSV 115.00
OPEN BRANCH FROM BUS 314587 TO BUS 314604 CKT 1 /* 3MARGTSV 115.00 - 3SEABORD 115.00
OPEN BUS 314587 /* ISLAND: 3MARGTSV 115.00
OPEN BUS 314604 /* ISLAND: 3SEABORD 115.00
OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00
OPEN BRANCH FROM BUS 314559 TO BUS 919690 CKT 1 /* 3CAROLNA 115.00 - AA2-053 TAP 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

Bus Number	*Bus Name*	*Full Contribution*
315126	*1ROARAP2*	*3.85*
315128	*1ROARAP4*	*3.7*
314578	*3HORNRTN*	*8.39*
314582	*3KELFORD*	*1.12*
314603	*3SCOT NK*	*7.59*
932631	*AC2-084 C*	*25.34*
932632	*AC2-084 E*	*12.48*
934041	*AD1-029 C*	*31.35*
934042	*AD1-029 E*	*20.66*
934231	*AD1-050 C*	*3.78*

934232	*AD1-050 E*	*2.06*
934331	*AD1-057 C O2*	*37.97*
934332	*AD1-057 E O2*	*20.26*
LTF	*AMIL*	*0.07*
LTF	*BAYOU*	*0.38*
LTF	*BIG_CAJUN1*	*0.6*
LTF	*BIG_CAJUN2*	*1.21*
LTF	*BLUEG*	*0.4*
LTF	*CALDERWOOD*	*0.22*
LTF	*CANNELTON*	*0.07*
LTF	*CARR*	*0.02*
LTF	*CATAWBA*	*0.21*
LTF	*CELEVELAND*	*0.6*
LTF	*CHEOAH*	*0.21*
LTF	*CHILHOWEE*	*0.07*
LTF	*CHOCTAW*	*0.41*
LTF	*CLIFTY*	*1.48*
LTF	*COTTONWOOD*	*1.5*
LTF	*DEARBORN*	*0.16*
LTF	*EDWARDS*	*0.12*
LTF	*ELMERSMITH*	*0.22*
LTF	*FARMERCITY*	*0.09*
LTF	*G-007*	*0.02*
LTF	*GIBSON*	*0.14*
LTF	*HAMLET*	*0.89*
LTF	*MORGAN*	*0.66*

LTF	*NEWTON*	*0.33*
LTF	*O-066*	*0.08*
LTF	*PRAIRIE*	*0.71*
LTF	*RENSSELAER*	*0.02*
LTF	*ROSETON*	*0.13*
LTF	*ROWAN*	*0.42*
LTF	*SANTEETLA*	*0.06*
LTF	*SMITHLAND*	*0.06*
LTF	*TATANKA*	*0.16*
LTF	*TILTON*	*0.15*
LTF	*TRIMBLE*	*0.08*
LTF	*TVA*	*0.28*
LTF	*UNIONPOWER*	*0.39*
917331	*Z2-043 C*	*0.62*
917332	*Z2-043 E*	*1.35*
917341	*Z2-044 C*	*1.29*
917342	*Z2-044 E*	*2.82*
918491	*AA1-063AC OP*	*3.94*
918492	*AA1-063AE OP*	*9.47*
918561	*AA1-072 C*	*0.09*
918562	*AA1-072 E*	*0.23*
919701	*AA2-057 C*	*5.99*
919702	*AA2-057 E*	*15.26*
919821	*AA2-068 C*	*1.52*
919822	*AA2-068 E*	*3.57*
920591	*AA2-165 C*	*0.82*

920592	*AA2-165 E*	*2.01*
920631	*AA2-169 C*	*2.82*
920632	*AA2-169 E*	*1.3*
924401	*AB2-089 C*	*1.71*
924402	*AB2-089 E*	*0.88*
926201	*AC1-098 C*	*17.78*
926202	*AC1-098 E*	*10.59*
926211	*AC1-099 C*	*5.96*
926212	*AC1-099 E*	*3.5*
927141	*AC1-208 C*	*28.79*
927142	*AC1-208 E*	*12.78*

Appendix 26

(DVP - DVP) The 3DARLINGT DP-3ROAN DP 115 kV line (from bus 314628 to bus 314598 ckt 1) loads from 117.41% to 147.24% (**DC power flow**) of its load dump rating (202 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 12342'. This project contributes approximately 60.27 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 12342' /*BATTLEBORO
OPEN BUS 314554 /*BATTLEBORO 115KV BUS
OPEN BUS 314834 /*BATTLEBORO 115KV CAP
END

Bus Number	*Bus Name*	*Full Contribution*
314582	*3KELFORD*	*1.21*
314603	*3SCOT NK*	*8.46*
932631	*AC2-084 C*	*28.52*
932632	*AC2-084 E*	*14.05*
934041	*AD1-029 C*	*35.27*
934042	*AD1-029 E*	*23.25*
934331	*AD1-057 C O2*	*39.3*
934332	*AD1-057 E O2*	*20.96*
LTF	*AMIL*	*0.01*
LTF	*BAYOU*	*0.04*
LTF	*BIG_CAJUN1*	*0.06*
LTF	*BIG_CAJUN2*	*0.12*
LTF	*BLUEG*	*0.06*
LTF	*CALDERWOOD*	*0.02*
LTF	*CANNELTON*	*0.01*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*0.02*
LTF	*CELEVELAND*	*0.05*

LTF	*CHEOAH*	*0.02*
LTF	*CHILHOWEE*	*< 0.01*
LTF	*CHOCTAW*	*0.04*
LTF	*CLIFTY*	*0.24*
LTF	*COTTONWOOD*	*0.15*
LTF	*DEARBORN*	*0.03*
LTF	*EDWARDS*	*0.02*
LTF	*ELMERSMITH*	*0.03*
LTF	*FARMERCITY*	*0.01*
LTF	*G-007*	*0.01*
LTF	*GIBSON*	*0.02*
LTF	*HAMLET*	*0.04*
LTF	*MORGAN*	*0.07*
LTF	*NEWTON*	*0.05*
LTF	*O-066*	*0.04*
LTF	*PRAIRIE*	*0.09*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.03*
LTF	*ROWAN*	*0.04*
LTF	*SANTEETLA*	*< 0.01*
LTF	*SMITHLAND*	*< 0.01*
LTF	*TATANKA*	*0.02*
LTF	*TILTON*	*0.02*
LTF	*TRIMBLE*	*0.01*
LTF	*TVA*	*0.03*
LTF	*UNIONPOWER*	*0.03*

917331	*Z2-043 C*	*0.66*
917332	*Z2-043 E*	*1.45*
917341	*Z2-044 C*	*1.06*
917342	*Z2-044 E*	*2.31*
918561	*AA1-072 C*	*0.1*
918562	*AA1-072 E*	*0.24*
919701	*AA2-057 C*	*5.54*
919702	*AA2-057 E*	*14.1*
919821	*AA2-068 C*	*1.72*
919822	*AA2-068 E*	*4.04*
920591	*AA2-165 C*	*0.76*
920592	*AA2-165 E*	*1.86*
926201	*AC1-098 C*	*20.01*
926202	*AC1-098 E*	*11.92*
926211	*AC1-099 C*	*6.7*
926212	*AC1-099 E*	*3.94*
927141	*AC1-208 C*	*40.1*
927142	*AC1-208 E*	*17.8*

Appendix 27

(DVP - DVP) The 6ELIZ CT-6SHAWBRO 230 kV line (from bus 314638 to bus 314647 ckt 1) loads from 114.72% to 116.15% (**DC power flow**) of its load dump rating (699 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 246T247'. This project contributes approximately 9.99 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 246T247' /* SUFFOLK 230 KV
OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* 6SUFFOLK 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00
OPEN BUS 314575 /* ISLAND: 6NUCO TP 230.00
OPEN BUS 314590 /* ISLAND: 6NUCOR 230.00
OPEN BRANCH FROM BUS 314537 TO BUS 314648 CKT 1 /* 6SUFFOLK 230.00 - 6SUNBURY 230.00
OPEN BRANCH FROM BUS 314648 TO BUS 901080 CKT 1 /* 6SUNBURY 230.00 - W1-029 230.00
OPEN BUS 314648 /* ISLAND: 6SUNBURY 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*4.91*
315292	*1DOMTR78*	*3.32*
315293	*1DOMTR9*	*2.71*
315139	*1GASTONA*	*2.23*
315141	*1GASTONB*	*2.23*
315136	*1ROSEMG1*	*1.59*
315138	*1ROSEMG2*	*0.74*
315137	*1ROSEMS1*	*0.98*
314557	*3BETHELC*	*0.6*
314566	*3CRESWEL*	*6.73*
314582	*3KELFORD*	*0.78*

314603	*3SCOT NK*	*2.7*
314617	*3TUNIS*	*0.7*
314620	*6CASHIE*	*1.59*
314574	*6EVERETS*	*2.49*
314594	*6PLYMOTH*	*2.03*
314651	*6WINFALL*	*6.57*
932631	*AC2-084 C*	*6.53*
932632	*AC2-084 E*	*3.22*
933451	*AC2-158 C*	*8.08*
933452	*AC2-158 E*	*8.08*
933461	*AC2-159 C*	*5.4*
933462	*AC2-159 E*	*5.4*
933711	*AC2-194 C*	*4.07*
933712	*AC2-194 E*	*6.57*
933991	*AD1-023 C*	*27.52*
933992	*AD1-023 E*	*14.98*
934041	*AD1-029 C*	*8.08*
934042	*AD1-029 E*	*5.32*
934331	*AD1-057 C O2*	*6.51*
934332	*AD1-057 E O2*	*3.48*
934521	*AD1-076 C O2*	*103.06*
934522	*AD1-076 E O2*	*52.48*
LTF	*CARR*	*0.07*
LTF	*CBM-S1*	*3.23*
LTF	*CBM-S2*	*6.64*
LTF	*CBM-W1*	*7.04*

LTF	*CBM-W2*	*17.41*
LTF	*CIN*	*1.58*
LTF	*CPLE*	*2.31*
LTF	*G-007*	*0.43*
LTF	*IPL*	*1.01*
LTF	*LGEE*	*0.34*
LTF	*MEC*	*3.58*
LTF	*MECS*	*1.59*
LTF	*O-066*	*1.43*
LTF	*RENSSELAER*	*0.05*
LTF	*ROSETON*	*0.38*
900671	*V4-068 C*	*0.07*
900672	*V4-068 E*	*0.18*
901081	*W1-029C*	*5.03*
901082	*W1-029E*	*171.41*
LTF	*WEC*	*0.43*
913391	*Y1-086 C*	*1.08*
913392	*Y1-086 E*	*8.99*
916041	*Z1-036 C*	*4.62*
916042	*Z1-036 E*	*157.7*
917121	*Z2-027 C*	*1.99*
917122	*Z2-027 E*	*4.35*
917331	*Z2-043 C*	*0.43*
917332	*Z2-043 E*	*0.94*
917511	*Z2-088 C OP1*	*0.77*
917512	*Z2-088 E OP1*	*3.1*

918411	*AA1-050*	*0.65*
918511	*AA1-065 C OP*	*2.22*
918512	*AA1-065 E OP*	*5.58*
918531	*AA1-067 C*	*0.34*
918532	*AA1-067 E*	*0.75*
918561	*AA1-072 C*	*0.06*
918562	*AA1-072 E*	*0.16*
919691	*AA2-053 C*	*1.15*
919692	*AA2-053 E*	*2.52*
919701	*AA2-057 C*	*0.89*
919702	*AA2-057 E*	*2.26*
919731	*AA2-059 C*	*0.77*
919732	*AA2-059 E*	*1.86*
919821	*AA2-068 C*	*0.29*
919822	*AA2-068 E*	*0.69*
LTF	*AA2-074*	*1.57*
920591	*AA2-165 C*	*0.12*
920592	*AA2-165 E*	*0.3*
920671	*AA2-174 C*	*0.05*
920672	*AA2-174 E*	*0.29*
920691	*AA2-178 C*	*26.93*
920692	*AA2-178 E*	*11.54*
930051	*AB1-013 C*	*8.13*
930052	*AB1-013 E*	*54.39*
930861	*AB1-132 C*	*8.68*
930862	*AB1-132 E*	*3.72*

923831	*AB2-022 C*	*9.92*
923832	*AB2-022 E*	*5.34*
923941	*AB2-035 C*	*0.25*
923942	*AB2-035 E*	*0.11*
924381	*AB2-087 C*	*0.6*
924382	*AB2-087 E*	*0.28*
924391	*AB2-088 C*	*0.32*
924392	*AB2-088 E*	*0.16*
924491	*AB2-098 C*	*0.58*
924492	*AB2-098 E*	*0.25*
924501	*AB2-099 C*	*0.56*
924502	*AB2-099 E*	*0.24*
925121	*AB2-169 C*	*11.25*
925122	*AB2-169 E*	*10.1*
925281	*AB2-186 C*	*2.19*
925282	*AB2-186 E*	*0.94*
925291	*AB2-188 C O1*	*6.64*
925292	*AB2-188 E O1*	*2.98*
925591	*AC1-034 C*	*5.13*
925592	*AC1-034 E*	*3.87*
926071	*AC1-086 C*	*12.79*
926072	*AC1-086 E*	*5.82*
926201	*AC1-098 C*	*4.58*
926202	*AC1-098 E*	*2.73*
926211	*AC1-099 C*	*1.54*
926212	*AC1-099 E*	*0.9*

926771	*AC1-163 C*	*1.84*
926772	*AC1-163 E*	*0.86*
927021	*AC1-189 C*	*7.54*
927022	*AC1-189 E*	*3.75*
927141	*AC1-208 C*	*5.8*
927142	*AC1-208 E*	*2.58*

Appendix 28

(DVP - DVP) The AB2-100 TAP-6CLUBHSE 230 kV line (from bus 924510 to bus 314563 ckt 1) loads from 122.52% to 126.01% (**DC power flow**) of its load dump rating (459 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 246T247'. This project contributes approximately 16.01 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 246T247' /* SUFFOLK 230 KV
OPEN BRANCH FROM BUS 314537 TO BUS 314575 CKT 1 /* 6SUFFOLK 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00
OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00
OPEN BUS 314575 /* ISLAND: 6NUCO TP 230.00
OPEN BUS 314590 /* ISLAND: 6NUCOR 230.00
OPEN BRANCH FROM BUS 314537 TO BUS 314648 CKT 1 /* 6SUFFOLK 230.00 - 6SUNBURY 230.00
OPEN BRANCH FROM BUS 314648 TO BUS 901080 CKT 1 /* 6SUNBURY 230.00 - W1-029 230.00
OPEN BUS 314648 /* ISLAND: 6SUNBURY 230.00
END

Bus Number	*Bus Name*	*Full Contribution*
315294	*1DOMTR10*	*2.12*
315131	*1EDGECMA*	*10.48*
315132	*1EDGECMB*	*10.48*
315139	*1GASTONA*	*7.94*
315141	*1GASTONB*	*7.94*
315126	*1ROARAP2*	*1.63*
315128	*1ROARAP4*	*1.57*
315136	*1ROSEMG1*	*5.33*
315138	*1ROSEMG2*	*2.5*
315137	*1ROSEMS1*	*3.31*
314557	*3BETHELC*	*0.87*

314554	*3BTLEBRO*	*0.84*
314566	*3CRESWEL*	*1.64*
314578	*3HORNRTN*	*3.35*
314582	*3KELFORD*	*0.91*
314603	*3SCOT NK*	*3.55*
314617	*3TUNIS*	*0.81*
314620	*6CASHIE*	*0.83*
314574	*6EVERETS*	*2.43*
314594	*6PLYMOTH*	*0.69*
932631	*AC2-084 C*	*9.33*
932632	*AC2-084 E*	*4.6*
933451	*AC2-158 C*	*6.16*
933452	*AC2-158 E*	*6.16*
933461	*AC2-159 C*	*7.09*
933462	*AC2-159 E*	*7.09*
933991	*AD1-023 C*	*11.95*
933992	*AD1-023 E*	*6.5*
934041	*AD1-029 C*	*11.54*
934042	*AD1-029 E*	*7.61*
934331	*AD1-057 C O2*	*10.44*
934332	*AD1-057 E O2*	*5.57*
934521	*AD1-076 C O2*	*47.33*
934522	*AD1-076 E O2*	*24.1*
LTF	*AD1-120*	*3.75*
LTF	*AD1-121*	*3.72*
LTF	*CARR*	*0.09*

LTF	*CBM-S1*	*4.51*
LTF	*CBM-S2*	*9.28*
LTF	*CBM-W1*	*9.81*
LTF	*CBM-W2*	*24.32*
LTF	*CIN*	*2.2*
LTF	*CPLE*	*3.18*
LTF	*G-007*	*0.61*
LTF	*IPL*	*1.4*
LTF	*LGEE*	*0.47*
LTF	*MEC*	*4.99*
LTF	*MECS*	*2.2*
LTF	*O-066*	*2.02*
LTF	*RENSSELAER*	*0.08*
LTF	*ROSETON*	*0.55*
900672	*V4-068 E*	*0.24*
LTF	*WEC*	*0.61*
917331	*Z2-043 C*	*0.5*
917332	*Z2-043 E*	*1.1*
917341	*Z2-044 C*	*0.28*
917342	*Z2-044 E*	*0.61*
917511	*Z2-088 C OP1*	*1.02*
917512	*Z2-088 E OP1*	*4.12*
917592	*Z2-099 E*	*0.3*
918411	*AA1-050*	*0.86*
918491	*AA1-063AC OP*	*1.46*
918492	*AA1-063AE OP*	*3.51*

918511	*AA1-065 C OP*	*2.13*
918512	*AA1-065 E OP*	*5.34*
918531	*AA1-067 C*	*0.33*
918532	*AA1-067 E*	*0.73*
918561	*AA1-072 C*	*0.08*
918562	*AA1-072 E*	*0.18*
919691	*AA2-053 C*	*1.76*
919692	*AA2-053 E*	*3.86*
919701	*AA2-057 C*	*1.46*
919702	*AA2-057 E*	*3.73*
919732	*AA2-059 E*	*0.29*
919821	*AA2-068 C*	*0.46*
919822	*AA2-068 E*	*1.08*
LTF	*AA2-074*	*2.16*
920022	*AA2-086 E*	*0.16*
920042	*AA2-088 E*	*6.95*
920591	*AA2-165 C*	*0.2*
920592	*AA2-165 E*	*0.49*
920631	*AA2-169 C*	*1.37*
920632	*AA2-169 E*	*0.63*
920671	*AA2-174 C*	*0.08*
920672	*AA2-174 E*	*0.45*
920691	*AA2-178 C*	*6.54*
920692	*AA2-178 E*	*2.8*
930051	*AB1-013 C*	*1.97*
930052	*AB1-013 E*	*13.21*

930401	*AB1-081 C*	*9.53*
930402	*AB1-081 E*	*4.08*
930861	*AB1-132 C*	*30.89*
930862	*AB1-132 E*	*13.24*
923941	*AB2-035 C*	*0.37*
923942	*AB2-035 E*	*0.16*
924151	*AB2-059 C O1*	*11.23*
924152	*AB2-059 E O1*	*5.78*
924381	*AB2-087 C*	*0.64*
924382	*AB2-087 E*	*0.3*
924391	*AB2-088 C*	*0.47*
924392	*AB2-088 E*	*0.23*
924491	*AB2-098 C*	*0.57*
924492	*AB2-098 E*	*0.24*
924501	*AB2-099 C*	*0.61*
924502	*AB2-099 E*	*0.26*
924511	*AB2-100 C*	*42.69*
924512	*AB2-100 E*	*21.03*
925121	*AB2-169 C*	*5.87*
925122	*AB2-169 E*	*5.27*
925291	*AB2-188 C O1*	*1.61*
925292	*AB2-188 E O1*	*0.72*
925591	*AC1-034 C*	*7.44*
925592	*AC1-034 E*	*5.62*
926071	*AC1-086 C*	*45.49*
926072	*AC1-086 E*	*20.7*

926201	*AC1-098 C*	*6.55*
926202	*AC1-098 E*	*3.9*
926211	*AC1-099 C*	*2.19*
926212	*AC1-099 E*	*1.29*
926771	*AC1-163 C*	*2.03*
926772	*AC1-163 E*	*0.95*
927021	*AC1-189 C*	*9.*
927022	*AC1-189 E*	*4.48*
927141	*AC1-208 C*	*9.41*
927142	*AC1-208 E*	*4.18*

Appendix 29

(DVP - DVP) The AC1-208 TAP-3DARLINGT DP 115 kV line (from bus 927140 to bus 314628 ckt 1) loads from 120.13% to 149.97% (**DC power flow**) of its load dump rating (202 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 12342'. This project contributes approximately 60.27 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 12342' /*BATTLEBORO
OPEN BUS 314554 /*BATTLEBORO 115KV BUS
OPEN BUS 314834 /*BATTLEBORO 115KV CAP
END

Bus Number	*Bus Name*	*Full Contribution*
314582	*3KELFORD*	*1.21*
314603	*3SCOT NK*	*8.46*
932631	*AC2-084 C*	*28.52*
932632	*AC2-084 E*	*14.05*
934041	*AD1-029 C*	*35.27*
934042	*AD1-029 E*	*23.25*
934331	*AD1-057 C O2*	*39.3*
934332	*AD1-057 E O2*	*20.96*
LTF	*AMIL*	*0.01*
LTF	*BAYOU*	*0.04*
LTF	*BIG_CAJUN1*	*0.06*
LTF	*BIG_CAJUN2*	*0.12*
LTF	*BLUEG*	*0.06*
LTF	*CALDERWOOD*	*0.02*
LTF	*CANNELTON*	*0.01*
LTF	*CARR*	*< 0.01*
LTF	*CATAWBA*	*0.02*
LTF	*CELEVELAND*	*0.05*

LTF	*CHEOAH*	*0.02*
LTF	*CHILHOWEE*	*< 0.01*
LTF	*CHOCTAW*	*0.04*
LTF	*CLIFTY*	*0.24*
LTF	*COTTONWOOD*	*0.15*
LTF	*DEARBORN*	*0.03*
LTF	*EDWARDS*	*0.02*
LTF	*ELMERSMITH*	*0.03*
LTF	*FARMERCITY*	*0.01*
LTF	*G-007*	*0.01*
LTF	*GIBSON*	*0.02*
LTF	*HAMLET*	*0.04*
LTF	*MORGAN*	*0.07*
LTF	*NEWTON*	*0.05*
LTF	*O-066*	*0.04*
LTF	*PRAIRIE*	*0.09*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.03*
LTF	*ROWAN*	*0.04*
LTF	*SANTEETLA*	*< 0.01*
LTF	*SMITHLAND*	*< 0.01*
LTF	*TATANKA*	*0.02*
LTF	*TILTON*	*0.02*
LTF	*TRIMBLE*	*0.01*
LTF	*TVA*	*0.03*
LTF	*UNIONPOWER*	*0.03*

917331	*Z2-043 C*	*0.66*
917332	*Z2-043 E*	*1.45*
917341	*Z2-044 C*	*1.06*
917342	*Z2-044 E*	*2.31*
918561	*AA1-072 C*	*0.1*
918562	*AA1-072 E*	*0.24*
919701	*AA2-057 C*	*5.54*
919702	*AA2-057 E*	*14.1*
919821	*AA2-068 C*	*1.72*
919822	*AA2-068 E*	*4.04*
920591	*AA2-165 C*	*0.76*
920592	*AA2-165 E*	*1.86*
926201	*AC1-098 C*	*20.01*
926202	*AC1-098 E*	*11.92*
926211	*AC1-099 C*	*6.7*
926212	*AC1-099 E*	*3.94*
927141	*AC1-208 C*	*40.1*
927142	*AC1-208 E*	*17.8*

Appendix 30

(DVP - DVP) The AD1-034 TAP-6SAPONY 230 kV line (from bus 934070 to bus 314435 ckt 1) loads from 136.11% to 139.34% (**DC power flow**) of its load dump rating (637 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 246T2034'. This project contributes approximately 21.79 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 246T2034' /* EARLEYS
OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 246
OPEN BRANCH FROM BUS 314575 TO BUS 314537 CKT 1 /* 246
OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 246 - NUCOR
OPEN BRANCH FROM BUS 314569 TO BUS 933450 CKT 1 /* 2034
END

Bus Number	*Bus Name*	*Full Contribution*
315131	*1EDGECMA*	*11.46*
315132	*1EDGECMB*	*11.46*
315139	*1GASTONA*	*7.99*
315141	*1GASTONB*	*7.99*
315126	*1ROARAP2*	*2.89*
315128	*1ROARAP4*	*2.78*
315136	*1ROSEMG1*	*5.4*
315138	*1ROSEMG2*	*2.53*
315137	*1ROSEMS1*	*3.35*
314557	*3BETHELC*	*0.96*
314554	*3BTLEBRO*	*0.97*
314572	*3EMPORIA*	*1.07*
314578	*3HORNRTN*	*5.76*
314582	*3KELFORD*	*1.24*
314704	*3LAWRENC*	*0.85*
314603	*3SCOT NK*	*4.89*
314617	*3TUNIS*	*1.14*

314541	*3WATKINS*	*0.52*
314574	*6EVERETS*	*2.71*
932631	*AC2-084 C*	*12.97*
932632	*AC2-084 E*	*6.39*
933461	*AC2-159 C*	*10.98*
933462	*AC2-159 E*	*10.98*
934041	*AD1-029 C*	*16.05*
934042	*AD1-029 E*	*10.58*
934071	*AD1-034 C O2*	*32.99*
934072	*AD1-034 E O2*	*21.38*
934201	*AD1-047 C*	*18.26*
934202	*AD1-047 E*	*12.17*
934231	*AD1-050 C*	*5.37*
934232	*AD1-050 E*	*2.93*
934331	*AD1-057 C O2*	*14.21*
934332	*AD1-057 E O2*	*7.58*
934621	*AD1-088 C O2*	*12.9*
934622	*AD1-088 E O2*	*6.05*
LTF	*AD1-120*	*4.72*
LTF	*AD1-121*	*4.7*
LTF	*CARR*	*0.12*
LTF	*CBM-S1*	*5.81*
LTF	*CBM-S2*	*11.59*
LTF	*CBM-W1*	*12.9*
LTF	*CBM-W2*	*31.36*
LTF	*CIN*	*2.91*

LTF	*CPLE*	*3.91*
LTF	*G-007*	*0.8*
LTF	*IPL*	*1.85*
LTF	*LGEE*	*0.63*
LTF	*MEC*	*6.5*
LTF	*MECS*	*2.94*
LTF	*O-066*	*2.67*
LTF	*RENSSELAER*	*0.1*
LTF	*ROSETON*	*0.7*
900671	*V4-068 C*	*0.13*
900672	*V4-068 E*	*0.37*
LTF	*WEC*	*0.8*
917331	*Z2-043 C*	*0.68*
917332	*Z2-043 E*	*1.49*
917341	*Z2-044 C*	*0.34*
917342	*Z2-044 E*	*0.75*
917511	*Z2-088 C OP1*	*1.13*
917512	*Z2-088 E OP1*	*4.55*
917591	*Z2-099 C*	*0.22*
917592	*Z2-099 E*	*0.48*
918411	*AA1-050*	*0.95*
918491	*AA1-063AC OP*	*2.52*
918492	*AA1-063AE OP*	*6.06*
918511	*AA1-065 C OP*	*2.7*
918512	*AA1-065 E OP*	*6.77*
918531	*AA1-067 C*	*0.37*

918532	*AA1-067 E*	*0.81*
918561	*AA1-072 C*	*0.1*
918562	*AA1-072 E*	*0.25*
919691	*AA2-053 C*	*2.94*
919692	*AA2-053 E*	*6.44*
919701	*AA2-057 C*	*1.91*
919702	*AA2-057 E*	*4.86*
919821	*AA2-068 C*	*0.64*
919822	*AA2-068 E*	*1.51*
LTF	*AA2-074*	*2.66*
920021	*AA2-086 C*	*0.11*
920022	*AA2-086 E*	*0.26*
920041	*AA2-088 C*	*1.35*
920042	*AA2-088 E*	*11.25*
920591	*AA2-165 C*	*0.26*
920592	*AA2-165 E*	*0.64*
920631	*AA2-169 C*	*2.97*
920632	*AA2-169 E*	*1.36*
920671	*AA2-174 C*	*0.13*
920672	*AA2-174 E*	*0.74*
930401	*AB1-081 C*	*10.91*
930402	*AB1-081 E*	*4.68*
930861	*AB1-132 C*	*31.1*
930862	*AB1-132 E*	*13.33*
931231	*AB1-173 C*	*5.14*
931232	*AB1-173 E*	*2.4*

931241	*AB1-173AC*	*5.14*
931242	*AB1-173AE*	*2.4*
923911	*AB2-031 C O1*	*5.1*
923912	*AB2-031 E O1*	*2.51*
923941	*AB2-035 C*	*0.4*
923942	*AB2-035 E*	*0.17*
923991	*AB2-040 C O1*	*16.74*
923992	*AB2-040 E O1*	*13.69*
924021	*AB2-043 C O1*	*2.79*
924022	*AB2-043 E O1*	*4.58*
924151	*AB2-059 C O1*	*12.86*
924152	*AB2-059 E O1*	*6.63*
924161	*AB2-060 C O1*	*7.93*
924162	*AB2-060 E O1*	*3.73*
924301	*AB2-077 C O1*	*1.75*
924302	*AB2-077 E O1*	*1.17*
924311	*AB2-078 C O1*	*1.75*
924312	*AB2-078 E O1*	*1.17*
924321	*AB2-079 C O1*	*1.75*
924322	*AB2-079 E O1*	*1.17*
924381	*AB2-087 C*	*0.86*
924382	*AB2-087 E*	*0.4*
924391	*AB2-088 C*	*0.52*
924392	*AB2-088 E*	*0.25*
924401	*AB2-089 C*	*2.43*
924402	*AB2-089 E*	*1.25*

924411	*AB2-090 C*	*3.52*
924412	*AB2-090 E*	*1.8*
924491	*AB2-098 C*	*0.63*
924492	*AB2-098 E*	*0.27*
924501	*AB2-099 C*	*0.85*
924502	*AB2-099 E*	*0.36*
924511	*AB2-100 C*	*36.7*
924512	*AB2-100 E*	*18.08*
925171	*AB2-174 C O1*	*16.74*
925172	*AB2-174 E O1*	*15.15*
925221	*AB2-176 C*	*1.45*
925222	*AB2-176 E*	*0.62*
925591	*AC1-034 C*	*8.2*
925592	*AC1-034 E*	*6.18*
925781	*AC1-054 C*	*8.75*
925782	*AC1-054 E*	*4.03*
926071	*AC1-086 C*	*45.8*
926072	*AC1-086 E*	*20.85*
926201	*AC1-098 C*	*9.1*
926202	*AC1-098 E*	*5.42*
926211	*AC1-099 C*	*3.05*
926212	*AC1-099 E*	*1.79*
926771	*AC1-163 C*	*2.79*
926772	*AC1-163 E*	*1.3*
927021	*AC1-189 C*	*9.96*
927022	*AC1-189 E*	*4.96*

927111	*AC1-206 C*	*32.89*
927112	*AC1-206 E*	*15.55*
927141	*AC1-208 C*	*14.12*
927142	*AC1-208 E*	*6.27*

Appendix 31

(DVP - DVP) The AD1-057 TAP-3COX DP 115 kV line (from bus 934330 to bus 314577 ckt 1) loads from 133.52% to 161.26% (**DC power flow**) of its load dump rating (202 MVA) for the line fault with failed breaker contingency outage of 'DVP_P4-2: 5602'. This project contributes approximately 58.26 MW to the thermal violation.

CONTINGENCY 'DVP_P4-2: 5602' /* CAROLINA 115 KV
OPEN BRANCH FROM BUS 313723 TO BUS 314604 CKT 1 /* 3PECAN 115.00 - 3SEABORD 115.00
OPEN BRANCH FROM BUS 314558 TO BUS 314587 CKT 1 /* 3BOYKINS 115.00 - 3MARGTSV 115.00
OPEN BRANCH FROM BUS 314587 TO BUS 314604 CKT 1 /* 3MARGTSV 115.00 - 3SEABORD 115.00
OPEN BUS 314587 /* ISLAND: 3MARGTSV 115.00
OPEN BUS 314604 /* ISLAND: 3SEABORD 115.00
OPEN BRANCH FROM BUS 314559 TO BUS 314571 CKT 1 /* 3CAROLNA 115.00 - 3EATON F 115.00
OPEN BRANCH FROM BUS 314559 TO BUS 919690 CKT 1 /* 3CAROLNA 115.00 - AA2-053 TAP 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

Bus Number	*Bus Name*	*Full Contribution*
315126	*1ROARAP2*	*3.85*
315128	*1ROARAP4*	*3.71*
314578	*3HORNRTN*	*8.39*
314582	*3KELFORD*	*1.13*
314603	*3SCOT NK*	*7.6*
932631	*AC2-084 C*	*25.36*
932632	*AC2-084 E*	*12.49*
934041	*AD1-029 C*	*31.37*
934042	*AD1-029 E*	*20.68*
934231	*AD1-050 C*	*3.78*

934232	*AD1-050 E*	*2.07*
934331	*AD1-057 C O2*	*37.99*
934332	*AD1-057 E O2*	*20.27*
LTF	*AMIL*	*0.07*
LTF	*BAYOU*	*0.35*
LTF	*BIG_CAJUN1*	*0.55*
LTF	*BIG_CAJUN2*	*1.11*
LTF	*BLUEG*	*0.34*
LTF	*CALDERWOOD*	*0.2*
LTF	*CANNELTON*	*0.07*
LTF	*CARR*	*0.01*
LTF	*CATAWBA*	*0.2*
LTF	*CELEVELAND*	*0.57*
LTF	*CHEOAH*	*0.19*
LTF	*CHILHOWEE*	*0.07*
LTF	*CHOCTAW*	*0.38*
LTF	*CLIFTY*	*1.26*
LTF	*COTTONWOOD*	*1.37*
LTF	*DEARBORN*	*0.13*
LTF	*EDWARDS*	*0.11*
LTF	*ELMERSMITH*	*0.19*
LTF	*FARMERCITY*	*0.08*
LTF	*G-007A*	*0.02*
LTF	*GIBSON*	*0.12*
LTF	*HAMLET*	*0.86*
LTF	*MORGAN*	*0.61*

LTF	*NEWTON*	*0.29*
LTF	*O-066A*	*< 0.01*
LTF	*PRAIRIE*	*0.64*
LTF	*RENSSELAER*	*< 0.01*
LTF	*ROSETON*	*0.07*
LTF	*ROWAN*	*0.4*
LTF	*SANTEETLA*	*0.06*
LTF	*SMITHLAND*	*0.06*
LTF	*TATANKA*	*0.14*
LTF	*TILTON*	*0.13*
LTF	*TRIMBLE*	*0.07*
LTF	*TVA*	*0.25*
LTF	*UNIONPOWER*	*0.36*
LTF	*VFT*	*0.05*
LTF	*X1-078*	*0.02*
917331	*Z2-043 C*	*0.62*
917332	*Z2-043 E*	*1.35*
918491	*AA1-063AC OP*	*3.95*
918492	*AA1-063AE OP*	*9.48*
918561	*AA1-072 C*	*0.09*
918562	*AA1-072 E*	*0.23*
919821	*AA2-068 C*	*1.52*
919822	*AA2-068 E*	*3.57*
920631	*AA2-169 C*	*2.83*
920632	*AA2-169 E*	*1.3*
924401	*AB2-089 C*	*1.72*

924402	*AB2-089 E*	*0.88*
926201	*AC1-098 C*	*17.79*
926202	*AC1-098 E*	*10.6*
926211	*AC1-099 C*	*5.96*
926212	*AC1-099 E*	*3.5*
927141	*AC1-208 C*	*28.81*
927142	*AC1-208 E*	*12.79*

Appendix 32

(AEP - AEP) The 05EDAN 1-05DANVL2 138 kV line (from bus 242631 to bus 242620 ckt 1) loads from 109.49% to 110.17% (**DC power flow**) of its emergency rating (415 MVA) for the line fault with failed breaker contingency outage of 'AEP_P4_#7589_05J.FERR 765'. This project contributes approximately 6.28 MW to the thermal violation.

CONTINGENCY 'AEP_P4_#7589_05J.FERR 765'
OPEN BRANCH FROM BUS 242514 TO BUS 242520 CKT 1 / 242514 05J.FERR 765 242520 05J.FERR 500 1
OPEN BRANCH FROM BUS 242514 TO BUS 242684 CKT 2 / 242514 05J.FERR 765 242684 05J.FERR 138 2
OPEN BRANCH FROM BUS 242520 TO BUS 306719 CKT 1 / 242520 05J.FERR 500 306719 8ANTIOCH 500 1
END

Bus Number	*Bus Name*	*Full Contribution*
244012	*05PINNACLE*	*-2.08*
315131	*1EDGECMA*	*4.25*
315132	*1EDGECMB*	*4.25*
314557	*3BETHELC*	*0.35*
314554	*3BTLEBRO*	*0.37*
314572	*3EMPORIA*	*0.14*
314578	*3HORNRTN*	*1.21*
314582	*3KELFORD*	*0.3*
314603	*3SCOT NK*	*1.24*
314617	*3TUNIS*	*0.28*
314620	*6CASHIE*	*0.27*
314574	*6EVERETS*	*0.98*
314594	*6PLYMOTH*	*0.26*
932631	*AC2-084 C*	*3.42*
932632	*AC2-084 E*	*1.68*

932701	*AC2-093 C*	*24.4*
932702	*AC2-093 E*	*13.96*
932761	*AC2-100 C*	*3.66*
932762	*AC2-100 E*	*1.79*
932821	*AC2-107 C*	*3.48*
932822	*AC2-107 E*	*1.63*
933451	*AC2-158 C*	*1.78*
933452	*AC2-158 E*	*1.78*
933461	*AC2-159 C*	*2.33*
933462	*AC2-159 E*	*2.33*
933941	*AD1-017 C*	*0.84*
933942	*AD1-017 E*	*1.36*
933991	*AD1-023 C*	*4.1*
933992	*AD1-023 E*	*2.23*
934041	*AD1-029 C*	*4.23*
934042	*AD1-029 E*	*2.79*
934201	*AD1-047 C*	*2.75*
934202	*AD1-047 E*	*1.83*
934231	*AD1-050 C*	*2.01*
934232	*AD1-050 E*	*1.1*
934311	*AD1-055 C*	*1.07*
934312	*AD1-055 E*	*0.28*
934331	*AD1-057 C O2*	*4.1*
934332	*AD1-057 E O2*	*2.18*
934341	*AD1-058 C*	*3.99*
934342	*AD1-058 E*	*1.01*

934521	*AD1-076 C O2*	*18.*
934522	*AD1-076 E O2*	*9.16*
934611	*AD1-087 C O2*	*3.5*
934612	*AD1-087 E O2*	*1.63*
934621	*AD1-088 C O2*	*5.65*
934622	*AD1-088 E O2*	*2.65*
LTF	*AD1-120*	*7.55*
LTF	*AD1-121*	*7.6*
934911	*AD1-123 C*	*0.47*
934912	*AD1-123 E*	*0.24*
934991	*AD1-131 C*	*1.31*
934992	*AD1-131 E*	*0.87*
935171	*AD1-152 C O2*	*3.37*
935172	*AD1-152 E O2*	*2.25*
935221	*AD1-157 C*	*0.46*
935222	*AD1-157 E*	*0.31*
935231	*AD1-160 C*	*0.34*
935232	*AD1-160 E*	*0.47*
LTF	*AMIL*	*0.17*
LTF	*BLUEG*	*2.07*
LTF	*CANNELTON*	*0.27*
LTF	*CARR*	*0.06*
LTF	*CBM-S1*	*1.13*
LTF	*CBM-S2*	*16.92*
LTF	*CBM-W2*	*2.91*
LTF	*CLIFTY*	*10.78*

LTF	*CPLE*	*5.57*
LTF	*DEARBORN*	*0.99*
LTF	*EDWARDS*	*0.45*
LTF	*ELMERSMITH*	*0.71*
LTF	*FARMERCITY*	*0.12*
LTF	*G-007A*	*0.79*
LTF	*GIBSON*	*0.59*
LTF	*NEWTON*	*0.97*
LTF	*O-066A*	*0.36*
LTF	*PRAIRIE*	*0.86*
LTF	*RENSSELAER*	*0.05*
LTF	*ROSETON*	*0.35*
LTF	*SMITHLAND*	*< 0.01*
LTF	*TATANKA*	*0.34*
LTF	*TILTON*	*0.61*
LTF	*TRIMBLE*	*0.41*
900672	*V4-068 E*	*0.1*
LTF	*VFT*	*2.09*
LTF	*X1-078*	*0.61*
917332	*Z2-043 E*	*0.36*
917342	*Z2-044 E*	*0.25*
917512	*Z2-088 E OP1*	*1.66*
917592	*Z2-099 E*	*0.14*
918492	*AA1-063AE OP*	*1.37*
918512	*AA1-065 E OP*	*1.46*
918532	*AA1-067 E*	*0.29*

918562	*AA1-072 E*	*0.06*
919692	*AA2-053 E*	*1.33*
919702	*AA2-057 E*	*1.51*
919822	*AA2-068 E*	*0.41*
LTF	*AA2-074*	*3.79*
920022	*AA2-086 E*	*0.07*
920042	*AA2-088 E*	*3.27*
920592	*AA2-165 E*	*0.2*
920631	*AA2-169 C*	*0.91*
920632	*AA2-169 E*	*0.42*
920672	*AA2-174 E*	*0.15*
930401	*AB1-081 C*	*4.09*
930402	*AB1-081 E*	*1.75*
930861	*AB1-132 C*	*4.93*
930862	*AB1-132 E*	*2.11*
931231	*AB1-173 C*	*0.77*
931232	*AB1-173 E*	*0.36*
931241	*AB1-173AC*	*0.77*
931242	*AB1-173AE*	*0.36*
923911	*AB2-031 C O1*	*0.77*
923912	*AB2-031 E O1*	*0.38*
923941	*AB2-035 C*	*0.15*
923942	*AB2-035 E*	*0.06*
923991	*AB2-040 C O1*	*2.52*
923992	*AB2-040 E O1*	*2.06*
924021	*AB2-043 C O1*	*1.21*

924022	*AB2-043 E O1*	*1.99*
924151	*AB2-059 C O1*	*4.82*
924152	*AB2-059 E O1*	*2.48*
924161	*AB2-060 C O1*	*3.48*
924162	*AB2-060 E O1*	*1.64*
924301	*AB2-077 C O1*	*0.78*
924302	*AB2-077 E O1*	*0.52*
924311	*AB2-078 C O1*	*0.78*
924312	*AB2-078 E O1*	*0.52*
924321	*AB2-079 C O1*	*0.78*
924322	*AB2-079 E O1*	*0.52*
924381	*AB2-087 C*	*0.19*
924382	*AB2-087 E*	*0.09*
924391	*AB2-088 C*	*0.19*
924392	*AB2-088 E*	*0.09*
924401	*AB2-089 C*	*0.91*
924402	*AB2-089 E*	*0.47*
924411	*AB2-090 C*	*1.53*
924412	*AB2-090 E*	*0.78*
924491	*AB2-098 C*	*0.23*
924492	*AB2-098 E*	*0.1*
924501	*AB2-099 C*	*0.2*
924502	*AB2-099 E*	*0.08*
924511	*AB2-100 C*	*3.5*
924512	*AB2-100 E*	*1.72*
925121	*AB2-169 C*	*2.26*

925122	*AB2-169 E*	*2.03*
925171	*AB2-174 C O1*	*2.38*
925172	*AB2-174 E O1*	*2.15*
925221	*AB2-176 C*	*0.63*
925222	*AB2-176 E*	*0.27*
925591	*AC1-034 C*	*3.01*
925592	*AC1-034 E*	*2.27*
925611	*AC1-036 C*	*0.33*
925612	*AC1-036 E*	*0.54*
925781	*AC1-054 C*	*3.03*
925782	*AC1-054 E*	*1.4*
925991	*AC1-075 C*	*1.96*
925992	*AC1-075 E*	*1.11*
926021	*AC1-080 C*	*0.65*
926022	*AC1-080 E*	*0.37*
926051	*AC1-083 C*	*4.18*
926052	*AC1-083 E*	*6.82*
926071	*AC1-086 C*	*7.26*
926072	*AC1-086 E*	*3.31*
926201	*AC1-098 C*	*2.4*
926202	*AC1-098 E*	*1.43*
926211	*AC1-099 C*	*0.8*
926212	*AC1-099 E*	*0.47*
926271	*AC1-105 C*	*2.39*
926272	*AC1-105 E*	*1.19*
926771	*AC1-163 C*	*0.65*

926772	*AC1-163 E*	*0.3*
927021	*AC1-189 C*	*3.63*
927022	*AC1-189 E*	*1.81*
927111	*AC1-206 C*	*2.97*
927112	*AC1-206 E*	*1.4*
927141	*AC1-208 C*	*3.54*
927142	*AC1-208 E*	*1.57*
927251	*AC1-221 C*	*1.59*
927252	*AC1-221 E*	*1.59*
927261	*AC1-222 C*	*1.54*
927262	*AC1-222 E*	*1.46*