Generation Interconnection
Feasibility Study Report
Queue Position AC2-188

The Interconnection Customer (IC) has proposed a 20 MW (7.6 MW Capacity) solar generating facility to be located in Houston, Kent County, Delaware. At the IC's request, PJM studied the AC2-188 project at both a Primary and Secondary Point of Interconnection. The study results are provided below. The planned in-service date, as requested by the IC during the project kick-off call, is December, 2018. This date may not be not attainable due to additional required PJM studies and Transmission Owner construction schedule.

Point(s) of Interconnection

The Interconnection Customer requested a Primary and Secondary Point of Interconnection (POI) be evaluated for the AC2-188 project.

Primary Point of Interconnection

PJM studied the AC2-188 project as an injection into the Delmarva Power and Light Company (DPL) transmission system at the South Harrington 138 kV Substation and evaluated it for compliance with reliability criteria for summer peak conditions in 2020. The AC2-188 project will connect with the DPL transmission system at a new 138 kV line terminal to be constructed at the South Harrington 138 kV Substation.

Transmission Owner Scope of Attachment Facilities Work

Substation Interconnection Estimate

Scope: Construct a new terminal position onto the 138 kV ring bus at South Harrington Substation. The new position will be connected to a generator. The project will require the addition of a 138 kV breaker, 4 138 kV disconnect switches, 3 CT/VT combination units, and substation bus.

Estimate: $ 1,698,000
Construction Time: 24-36 months

Major Equipment Included in Estimate:

- Power Circuit Breaker, 138 kV, 2000A, 40kA, 3 cycle Qty. 1
- Disconnect Switch, 138 kV, 2000A, Manual Wormgear, Arcing Horns Qty. 4
- CT/VT Combination Units, 138 kV Qty. 3
- Disconnect Switch Stand, High, 138 kV, Steel Qty. 4
- Disconnect Switch Stand, Low, 138 kV, Steel Qty. 2
- CT/VT Stand, Single Phase, Low, 138 kV, Steel Qty. 3
- CVT Stand, Single Phase, Low, 138 kV, Steel Qty. 3
- Relay Panel, Transmission Line, FL/BU (20") Qty. 1
- Control Panel, 138 kV Circuit Breaker (10") Qty. 1

- Bus Support Structure, 3 phase, 138 kV, Steel Qty. 3
- Take-off structure, 138 kV Qty. 1

Estimate Assumptions:

- Site permitting to be performed by Interconnection Customer

Required Relaying and Communications

New protection relays are required for the new line terminals. An SEL-421 will be required for primary protection and an SEL-311C will be required for back-up protection. A 20" relay panel will be required for each transmission line (2 total).

New protection relays are required for the new generator terminal. An SEL-487 will be required for primary protection and an SEL-387 will be required for back-up protection. A 20" relay panel is required.

A SEL-451 relay on a 10" breaker control panel will be required for the control and operation of the new 138 kV circuit breakers (4 total).

The cost of the required relay and communications is included in the Substation Interconnection Estimate.

Metering

Three phase 138 kV revenue metering points will need to be established. DPL will purchase and install all metering instrument transformers as well as construct a metering structure. The secondary wiring connections at the instrument transformers will be completed by DPL's metering technicians. The metering control cable and meter cabinets will be supplied and installed by DPL. DPL will install conduit for the control cable between the instrument transformers and the metering enclosure. The location of the metering enclosure will be determined in the construction phase. DPL will provide both the Primary and the Backup meters. DPL's meter technicians will program and install the Primary & Backup solid state multi-function meters for each new metering position. Each meter will be equipped with load profile, telemetry, and DNP outputs. The IC will be provided with one meter DNP output for each meter. DPL will own the metering equipment for the interconnection point, unless the IC asserts its right to install, own, and operate the metering system.

The Interconnection Customer will be required to make provisions for a voice quality phone line within approximately 3 feet of each Company metering position to facilitate remote interrogation and data collection.

It is the IC's responsibility to send the data that PJM and DPL requires directly to PJM. The IC will grant permission for PJM to send DPL the following telemetry that the IC sends to PJM: real time MW, MVAR, volts, amperes, generator status, and interval MWH and MVARH.
The estimate for DPL to design, purchase, and install metering as specified in the aforementioned scope for metering is included in the Substation Interconnection Estimate.

Interconnection Customer Scope of Direct Connection Work

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

DPL Interconnection Customer Scope of Direct Connection Work Requirements:

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

Special Operating Requirements

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

2. DPL reserves the right to charge the Interconnection Customer operation and maintenance expenses to maintain the Interconnection Customer attachment facilities, including metering and telecommunications facilities, owned by DPL.

Summer Peak Analysis - 2020

Transmission Network Impacts

Potential transmission network impacts are as follows:

Generator Deliverability

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

None

Multiple Facility Contingency

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

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)

1. (DP&L - DP&L) The MILF_230-STEELE 230 kV line (from bus 232004 to bus 232000 ckt 1) loads from 185.38% to 187.76% (DC power flow) of its emergency rating (551 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 13.1 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 1 for a table containing the generators having contribution to this flowgate.

2. (DP&L - DP&L) The MIDLTNTP-MT PLSNT 138 kV line (from bus 232106 to bus 232104 ckt 1) loads from 117.19% to 118.43% (DC power flow) of its emergency rating (348 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 4.29 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 2 for a table containing the generators having contribution to this flowgate.

3. (DP&L - DP&L) The TOWNSEND-MIDLTNTP 138 kV line (from bus 232107 to bus 232106 ckt 1) loads from 127.94% to 129.17% (DC power flow) of its emergency rating (348 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 4.29 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 3 for a table containing the generators having contribution to this flowgate.

4. (DP&L - DP&L) The KENT-NMEREDTH 69 kV line (from bus 232215 to bus 232812 ckt 1) loads from 143.88% to 146.67% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 2.59 MW to the thermal violation.

CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Please refer to Appendix 4 for a table containing the generators having contribution to this flowgate.

5. (DP&L - DP&L) The KENT-NMEREDTH 69 kV line (from bus 232215 to bus 232812 ckt 1) loads from 103.29% to 105.48% (DC power flow) of its emergency rating (93 MVA) for the line fault with failed breaker contingency outage of 'DP11'. This project contributes approximately 2.04 MW to the thermal violation.

   CONTINGENCY 'DP11'/*STEELE BUS BREAKER TO MILFORD
   DISCONNECT BRANCH FROM BUS 232004 TO BUS 232000 CKT 1 /*MILFORD STEELE 230 230
   DISCONNECT BRANCH FROM BUS 232000 TO BUS 232005 CKT 1/*STEELE VIENNA 230 230
   END

6. (DP&L - DP&L) The NMEREDTH-AB2-135 TAP 69 kV line (from bus 232812 to bus 924820 ckt 1) loads from 118.72% to 121.51% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 2.59 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 5 for a table containing the generators having contribution to this flowgate.

7. (DP&L - DP&L) The AB2-037 TAP-KEEN_230 230 kV line (from bus 923960 to bus 231003 ckt 2) loads from 101.38% to 101.93% (DC power flow) of its emergency rating (727 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 8.9 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1

END

Please refer to Appendix 6 for a table containing the generators having contribution to this flowgate.

8. (DP&L - DP&L) The AB2-135 TAP-CHURC_69 69 kV line (from bus 924820 to bus 232203 ckt 1) loads from 169.42% to 172.21% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 2.59 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 7 for a table containing the generators having contribution to this flowgate.

Summer Peak Load Flow Analysis Reinforcements

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

None

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 % allocation cost responsibility which will be calculated and reported for the Impact Study)

1. To mitigate the (DP&L) MILF_230-STEELE 230 kV line (from bus 232004 to bus 232000 ckt 1) overload will require increasing the emergency rating of the Milford to Steele 230 kV line by rebuilding the circuit. The rebuild includes the replacement of poles. The estimate to perform this work is **$43,965,000** and will take **4 years** to complete.

2. To mitigate the (DP&L) MIDLTNTP-MT PLSNT 138 kV line (from bus 232106 to bus 232104 ckt 1) overload will require increasing the emergency rating of the Townsend to Middletown Tap 138 kV line by rebuilding of a small section of the circuit. The rebuild includes the installation of new poles and the re-mounting of 138 kV disconnect switches. The estimate to perform this work is **$800,000** and will take **18 months** to complete.

3. To mitigate the (DP&L) TOWNSEND-MIDLTNTP 138 kV line (from bus 232107 to bus 232106 ckt 1) overload will require increasing the emergency rating of the Townsend to Middletown Tap 138 kV line by rebuilding of a small section of the circuit. The rebuild includes the installation of

new poles and the re-mounting of 138 kV disconnect switches. The estimate to perform this work is **$800,000** and will take **18 months** to complete.

4. To mitigate the (DP&L) KENT-NMEREDTH 69 kV line (from bus 232215 to bus 232812 ckt 1) overload will require increasing the emergency rating of the Kent to New Meredith 69 kV line by rebuilding the circuit. Work scope will include the installation of new poles, new disconnect switches, and new relays. Estimated Cost**: $9,720,000**; Estimated Time: **24-36 months.**

5. Same as Contribution to Previously Identified System Reinforcements #4.

6. To mitigate the (DP&L) NMEREDTH-AB2-135 TAP 69 kV line (from bus 232812 to bus 924820 ckt 1) overload will require increasing the emergency rating of the AB2-135 to New Meredith 69 kV line. Work scope will include the installation of new poles and a new disconnect switch. Estimated Cost**: $8,674,000;** Estimated Time: **36 months.**

7. To mitigate the (DP&L) AB2-037 TAP-KEEN_230 230 kV line (from bus 923960 to bus 231003 ckt 2) overload will require relay upgrades at Keeney Substation. Estimates Cost: **$800,000**; Estimated Time: **12 months.**

8. To mitigate the (DP&L) AB2-135 TAP-CHURC_69 69 kV line (from bus 924820 to bus 232203 ckt 1) overload will require increasing the emergency rating of the AB2-135 to Church 69 kV line. Work scope will include rebuilding of the circuit, including the installation of new poles and a new disconnect switch. Estimated Cost: **$8,674,000**; Estimated Time: **36 months**.

Steady-State Voltage Requirements

To be performed during later study phases as required.

Short Circuit

No issues identified.

Stability and Reactive Power Requirement

To be performed during later study phases as required.

Light Load Analysis - 2020

To be performed during later study phases (as required by PJM Manual 14B).

Delivery of Energy Portion of Interconnection Request

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

Only the most severely overloaded conditions are listed. 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 will study all overload conditions associated with the overloaded element(s) identified.

1. (DP&L - DP&L) The MILF_230-STEELE 230 kV line (from bus 232004 to bus 232000 ckt 1) loads from 110.62% to 111.19% (DC power flow) of its emergency rating (551 MVA) for the single line contingency outage of 'CKT 23032'. This project contributes approximately 6.95 MW to the thermal violation.

   CONTINGENCY 'CKT 23032'
   OPEN LINE FROM BUS 231004 TO BUS 232003 CIRCUIT 1/RED LION - CARTANZA 230
   END

Delmarva Power and Light Costs

Cost estimates will further be refined as a part of the Impact Study and Facilities Study for this project. The Interconnection Customer will be responsible for all costs incurred by DPL in connection with the AC2-188 project. Such costs may include, but are not limited to, any transmission system assets currently in DPL's rate base that are prematurely retired due to the AC2-188 project. PJM shall work with DPL to identify these retirement costs and any additional expenses. DPL reserves the right to reassess issues presented in this document and, upon appropriate justification, submit additional costs related to the AC2-188 project.

Secondary Point of Interconnection

PJM studied the AC2-188 project into the Delmarva Power and Light (DPL) system as a direct connection into the Harrington 69 kV Substation and evaluated it for compliance with reliability criteria for summer peak conditions in 2020.

Summer Peak Analysis - 2020

Transmission Network Impacts

Potential transmission network impacts are as follows:

Generator Deliverability

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

None

Multiple Facility Contingency

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

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)

1. (DP&L - DP&L) The MILF_230-STEELE 230 kV line (from bus 232004 to bus 232000 ckt 1) loads from 186.08% to 187.06% (DC power flow) of its emergency rating (551 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 12.02 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 1 for a table containing the generators having contribution to this flowgate.

2. (DP&L - DP&L) The MIDLTNTP-MT PLSNT 138 kV line (from bus 232106 to bus 232104 ckt 1) loads from 117.14% to 118.48% (DC power flow) of its emergency rating (348 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 4.65 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 2 for a table containing the generators having contribution to this flowgate.

3. (DP&L - DP&L) The TOWNSEND-MIDLTNTP 138 kV line (from bus 232107 to bus 232106 ckt 1) loads from 127.86% to 129.2% (DC power flow) of its emergency rating (348 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 4.65 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 3 for a table containing the generators having contribution to this flowgate.

4. (DP&L - DP&L) The KENT-NMEREDTH 69 kV line (from bus 232215 to bus 232812 ckt 1) loads from 143.28% to 147.28% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 3.73 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 4 for a table containing the generators having contribution to this flowgate.

5. (DP&L - DP&L) The KENT-NMEREDTH 69 kV line (from bus 232215 to bus 232812 ckt 1) loads from 102.71% to 106.07% (DC power flow) of its emergency rating (93 MVA) for the line fault with failed breaker contingency outage of 'DP11'. This project contributes approximately 3.12 MW to the thermal violation.

   CONTINGENCY 'DP11'/*STEELE BUS BREAKER TO MILFORD
   DISCONNECT BRANCH FROM BUS 232004 TO BUS 232000 CKT 1/*MILFORD STEELE 230 230
   DISCONNECT BRANCH FROM BUS 232000 TO BUS 232005 CKT 1/*STEELE VIENNA 230 230
   END

6. (DP&L - DP&L) The NMEREDTH-AB2-135 TAP 69 kV line (from bus 232812 to bus 924820 ckt 1) loads from 118.12% to 122.12% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 3.73 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 5 for a table containing the generators having contribution to this flowgate.

7. (DP&L - DP&L) The AB2-037 TAP-KEEN_230 230 kV line (from bus 923960 to bus 231003 ckt 2) loads from 101.38% to 101.92% (DC power flow) of its emergency rating (727 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 8.7 MW to the thermal violation.

CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Please refer to Appendix 6 for a table containing the generators having contribution to this flowgate.

8. (DP&L - DP&L) The AB2-135 TAP-CHURC_69 69 kV line (from bus 924820 to bus 232203 ckt 1) loads from 168.71% to 172.71% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 3.73 MW to the thermal violation.

   CONTINGENCY 'DBL_4NC'/* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
   OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
   OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
   END

   Please refer to Appendix 7 for a table containing the generators having contribution to this flowgate.

Delivery of Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.
Only the most severely overloaded conditions are listed. 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 will study all overload conditions associated with the overloaded element(s) identified.

1. (DP&L - DP&L) The MILF_230-STEELE 230 kV line (from bus 232004 to bus 232000 ckt 1) loads from 110.65% to 111.14% (DC power flow) of its emergency rating (551 MVA) for the single line contingency outage of 'CKT 23032'. This project contributes approximately 5.97 MW to the thermal violation.

   CONTINGENCY 'CKT 23032'
   OPEN LINE FROM BUS 231004 TO BUS 232003 CIRCUIT 1 /RED LION - CARTANZA 230
   END

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. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact.
It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

Primary Point of Interconnection

Appendix 1

(DP&L - DP&L) The MILF_230-STEELE 230 kV line (from bus 232004 to bus 232000 ckt 1) loads from 185.38% to 187.76% (DC power flow) of its emergency rating (551 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 13.1 MW to the thermal violation.

CONTINGENCY 'DBL_4NC' /* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*11.13*
931162	*AC2-023 E*	*20.99*
932631	*AC2-185 C*	*10.11*
932632	*AC2-185 E*	*16.5*
932641	*AC2-186 C*	*2.49*
932642	*AC2-186 E*	*4.06*
932651	*AC2-187 C OP*	*4.57*
932652	*AC2-187 E OP*	*7.45*
932661	*AC2-188 C*	*4.98*
932662	*AC2-188 E*	*8.12*
932671	*AC2-189 C1 O*	*0.32*
932673	*AC2-189 C2 O*	*4.43*
932672	*AC2-189 E O*	*0.6*
932691	*AC2-191*	*11.84*
232900	*DEMECSMY*	*5.*
232616	*GEN FOOD*	*1.83*
232904	*IR4*	*44.*

232923	*MR1*	*12.52*
232924	*MR2*	*12.52*
232922	*MR3*	*12.27*
232901	*NORTHST*	*5.41*
297077	*V2-028 E*	*1.28*
904212	*V4-022 E*	*1.52*
901004	*W1-003 E*	*2.22*
901014	*W1-004 E*	*2.22*
901024	*W1-005 E*	*2.22*
901034	*W1-006 E*	*2.22*
901411	*W1-062*	*5.31*
903511	*W3-032A*	*37.18*
907052	*X1-032 E*	*1.89*
907324	*X1-096 E*	*42.95*
910572	*X3-008 E*	*3.32*
910592	*X3-015 E*	*3.8*
913412	*Y1-080 E*	*0.68*
915542	*Y3-058 E*	*4.1*
920582	*Z1-076 C*	*2.63*
920583	*Z1-076 E*	*4.3*
920592	*Z1-077 C*	*1.88*
920593	*Z1-077 E*	*3.07*
917082	*Z2-012 E*	*6.09*
920763	*Z2-076 E*	*1.22*
920773	*Z2-077 E*	*1.22*
921122	*AA1-059 C*	*1.99*
921123	*AA1-059 E*	*0.79*
921142	*AA1-061 C*	*3.72*
921143	*AA1-061 E*	*1.83*
921592	*AA1-140 C*	*4.6*
921593	*AA1-140 E*	*7.51*
921602	*AA1-141 C*	*2.84*
921603	*AA1-141 E*	*4.63*
921872	*AA2-069*	*390.46*
922213	*AA2-129 E*	*9.83*
922222	*AA2-130*	*0.92*
922752	*AB1-056 C OP*	*41.89*
922753	*AB1-056 E OP*	*119.28*
922762	*AB1-057 C*	*42.54*
922763	*AB1-057 E*	*121.23*
923282	*AB1-137 C*	*2.63*
923283	*AB1-137 E*	*1.13*
923902	*AB2-030 E*	*1.96*
923931	*AB2-033 C*	*3.52*
923932	*AB2-033 E*	*1.39*

924361	*AB2-084 C*	*1.79*
924362	*AB2-084 E*	*2.93*
924681	*AB2-120 C OP*	*18.78*
924682	*AB2-120 E OP*	*30.64*
924781	*AB2-130 C OP*	*16.78*
924782	*AB2-130 E OP*	*27.37*
924831	*AB2-136 C OP*	*7.6*
924832	*AB2-136 E OP*	*8.06*
925091	*AB2-166 C*	*0.95*
925092	*AB2-166 E*	*1.66*
925101	*AB2-167 C*	*2.63*
925102	*AB2-167 E*	*4.31*
925151	*AB2-172 C OP*	*5.08*
925152	*AB2-172 E OP*	*8.29*
925231	*AB2-177 C*	*1.25*
925232	*AB2-177 E*	*2.04*
925261	*AB2-180 C*	*6.18*
925262	*AB2-180 E*	*2.65*
925381	*AC1-009 C*	*3.73*
925382	*AC1-009 E*	*6.09*
925651	*AC1-041 C*	*0.95*
925652	*AC1-041 E*	*1.55*
925731	*AC1-049 C*	*0.91*
925732	*AC1-049 E*	*1.51*
925741	*AC1-050 C*	*0.74*
925742	*AC1-050 E*	*1.21*
925761	*AC1-052 C*	*4.91*
925762	*AC1-052 E*	*1.96*
926131	*AC1-091 C*	*4.99*
926132	*AC1-091 E*	*8.18*
926141	*AC1-092 C*	*4.99*
926142	*AC1-092 E*	*8.18*
926151	*AC1-093 C*	*4.72*
926152	*AC1-093 E*	*7.78*
926161	*AC1-094 C*	*3.99*
926162	*AC1-094 E*	*6.59*
926171	*AC1-095 C*	*4.12*
926172	*AC1-095 E*	*3.13*
926911	*AC1-177*	*1.85*
927031	*AC1-190 C*	*9.6*
927032	*AC1-190 E*	*4.11*
927191	*AC1-213 C*	*1.65*
927192	*AC1-213 E*	*0.85*
927311	*AC1-228 C*	*0.29*
927312	*AC1-228 E*	*0.51*

927321	*AC1-229 C*	*2.39*
927322	*AC1-229 E*	*3.89*

Appendix 2

(DP&L - DP&L) The MIDLTNTP-MT PLSNT 138 kV line (from bus 232106 to bus 232104 ckt 1) loads from 117.19% to 118.43% (DC power flow) of its emergency rating (348 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 4.29 MW to the thermal violation.

CONTINGENCY 'DBL_4NC' /* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*5.32*
931162	*AC2-023 E*	*10.04*
932631	*AC2-185 C*	*3.34*
932632	*AC2-185 E*	*5.45*
932641	*AC2-186 C*	*0.82*
932642	*AC2-186 E*	*1.33*
932651	*AC2-187 C OP*	*1.77*
932652	*AC2-187 E OP*	*2.88*
932661	*AC2-188 C*	*1.63*
932662	*AC2-188 E*	*2.66*
932671	*AC2-189 C1 O*	*0.14*
932673	*AC2-189 C2 O*	*1.89*
932672	*AC2-189 E O*	*0.26*
932691	*AC2-191*	*3.85*
232900	*DEMECSMY*	*1.79*
232851	*DUP-SFR1*	*0.34*
232902	*EASTMUNI*	*2.84*
232923	*MR1*	*3.37*
232924	*MR2*	*3.37*
232910	*NRG_G1*	*2.03*
232911	*NRG_G2*	*2.03*
292089	*T-011*	*0.14*
297076	*V2-028 C*	*0.08*
297077	*V2-028 E*	*0.75*
904212	*V4-022 E*	*0.61*
232813	*VAUGHN*	*0.13*
232919	*VN10*	*0.47*
901004	*W1-003 E*	*0.89*
901014	*W1-004 E*	*0.89*

901024	*W1-005 E*	*0.89*
901034	*W1-006 E*	*0.89*
901411	*W1-062*	*1.9*
907052	*X1-032 E*	*0.79*
907324	*X1-096 E*	*18.29*
910571	*X3-008 C*	*0.27*
910572	*X3-008 E*	*2.68*
910591	*X3-015 C*	*0.25*
910592	*X3-015 E*	*2.52*
910821	*X3-066 C*	*0.14*
910822	*X3-066 E*	*1.41*
913361	*Y1-079 C*	*0.2*
913362	*Y1-079 E*	*1.96*
913411	*Y1-080 C*	*0.04*
913412	*Y1-080 E*	*0.43*
915541	*Y3-058 C*	*0.19*
915542	*Y3-058 E*	*1.86*
920582	*Z1-076 C*	*1.05*
920583	*Z1-076 E*	*1.71*
920592	*Z1-077 C*	*0.75*
920593	*Z1-077 E*	*1.22*
917082	*Z2-012 E*	*2.45*
920763	*Z2-076 E*	*0.4*
920773	*Z2-077 E*	*0.4*
920812	*Z2-097 C*	*1.57*
920813	*Z2-097 E*	*0.65*
921122	*AA1-059 C*	*0.85*
921123	*AA1-059 E*	*0.33*
921142	*AA1-061 C*	*2.88*
921143	*AA1-061 E*	*1.42*
921442	*AA1-110 C*	*1.78*
921443	*AA1-110 E*	*0.89*
921592	*AA1-140 C*	*1.52*
921593	*AA1-140 E*	*2.47*
921602	*AA1-141 C*	*1.13*
921603	*AA1-141 E*	*1.84*
921872	*AA2-069*	*104.94*
922213	*AA2-129 E*	*3.94*
922222	*AA2-130*	*0.39*
922752	*AB1-056 C OP*	*12.81*
922753	*AB1-056 E OP*	*36.48*
922762	*AB1-057 C*	*13.01*
922763	*AB1-057 E*	*37.07*
923282	*AB1-137 C*	*0.84*
923283	*AB1-137 E*	*0.36*

923322	*AB1-141 C OP*	*5.3*
923323	*AB1-141 E OP*	*2.47*
923332	*AB1-142 C OP*	*5.3*
923333	*AB1-142 E OP*	*2.47*
923452	*AB1-162 C OP*	*2.4*
923453	*AB1-162 E OP*	*3.92*
923602	*AB1-176 C*	*1.29*
923603	*AB1-176 E*	*2.12*
923902	*AB2-030 E*	*0.79*
923921	*AB2-032 C*	*5.34*
923922	*AB2-032 E*	*2.51*
923931	*AB2-033 C*	*1.41*
923932	*AB2-033 E*	*0.56*
923951	*AB2-036 C*	*11.73*
923952	*AB2-036 E*	*19.19*
923961	*AB2-037 C*	*12.75*
923962	*AB2-037 E*	*20.82*
924191	*AB2-063 C*	*2.87*
924192	*AB2-063 E*	*4.69*
924361	*AB2-084 C*	*0.75*
924362	*AB2-084 E*	*1.22*
924681	*AB2-120 C OP*	*7.49*
924682	*AB2-120 E OP*	*12.23*
924781	*AB2-130 C OP*	*6.58*
924782	*AB2-130 E OP*	*10.74*
924801	*AB2-133 C OP*	*10.92*
924802	*AB2-133 E OP*	*13.86*
924821	*AB2-135 C*	*12.06*
924822	*AB2-135 E*	*13.76*
924831	*AB2-136 C OP*	*5.2*
924832	*AB2-136 E OP*	*5.51*
924881	*AB2-142 C*	*1.14*
924882	*AB2-142 E*	*1.85*
924971	*AB2-153 C*	*2.98*
924972	*AB2-153 E*	*4.87*
925091	*AB2-166 C*	*0.4*
925092	*AB2-166 E*	*0.7*
925101	*AB2-167 C*	*1.05*
925102	*AB2-167 E*	*1.72*
925151	*AB2-172 C OP*	*4.11*
925152	*AB2-172 E OP*	*6.71*
925231	*AB2-177 C*	*0.49*
925232	*AB2-177 E*	*0.81*
925251	*AB2-179 C OP*	*26.3*
925252	*AB2-179 E OP*	*8.67*

925261	*AB2-180 C*	*2.8*
925262	*AB2-180 E*	*1.2*
925271	*AB2-185 C OP*	*4.42*
925272	*AB2-185 E OP*	*1.9*
925381	*AC1-009 C*	*1.5*
925382	*AC1-009 E*	*2.45*
925651	*AC1-041 C*	*0.38*
925652	*AC1-041 E*	*0.61*
925731	*AC1-049 C*	*0.3*
925732	*AC1-049 E*	*0.5*
925741	*AC1-050 C*	*0.38*
925742	*AC1-050 E*	*0.62*
925761	*AC1-052 C*	*1.97*
925762	*AC1-052 E*	*0.79*
926131	*AC1-091 C*	*1.65*
926132	*AC1-091 E*	*2.7*
926141	*AC1-092 C*	*1.65*
926142	*AC1-092 E*	*2.7*
926151	*AC1-093 C*	*1.56*
926152	*AC1-093 E*	*2.57*
926161	*AC1-094 C*	*1.32*
926162	*AC1-094 E*	*2.18*
926171	*AC1-095 C*	*1.36*
926172	*AC1-095 E*	*1.03*
926721	*AC1-154 C*	*0.49*
926722	*AC1-154 E*	*0.82*
926911	*AC1-177*	*0.79*
927031	*AC1-190 C*	*7.53*
927032	*AC1-190 E*	*3.23*
927191	*AC1-213 C*	*0.7*
927192	*AC1-213 E*	*0.36*
927241	*AC1-220 C OP*	*5.86*
927242	*AC1-220 E OP*	*4.16*
927272	*AC1-224 E*	*0.63*
927311	*AC1-228 C*	*0.24*
927312	*AC1-228 E*	*0.41*
927321	*AC1-229 C*	*0.76*
927322	*AC1-229 E*	*1.24*

Appendix 3

(DP&L - DP&L) The TOWNSEND-MIDLTNTP 138 kV line (from bus 232107 to bus 232106 ckt 1) loads from 127.94% to 129.17% (DC power flow) of its emergency rating (348 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 4.29 MW to the thermal violation.

CONTINGENCY 'DBL_4NC' /* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*5.32*
931162	*AC2-023 E*	*10.04*
932631	*AC2-185 C*	*3.34*
932632	*AC2-185 E*	*5.45*
932641	*AC2-186 C*	*0.82*
932642	*AC2-186 E*	*1.33*
932651	*AC2-187 C OP*	*1.77*
932652	*AC2-187 E OP*	*2.88*
932661	*AC2-188 C*	*1.63*
932662	*AC2-188 E*	*2.66*
932671	*AC2-189 C1 O*	*0.14*
932673	*AC2-189 C2 O*	*1.89*
932672	*AC2-189 E O*	*0.26*
932691	*AC2-191*	*3.85*
232900	*DEMECSMY*	*1.79*
232851	*DUP-SFR1*	*0.34*
232902	*EASTMUNI*	*2.84*
232923	*MR1*	*3.37*
232924	*MR2*	*3.37*
232910	*NRG_G1*	*2.03*
232911	*NRG_G2*	*2.03*
292089	*T-011*	*0.14*
297076	*V2-028 C*	*0.08*
297077	*V2-028 E*	*0.75*
904212	*V4-022 E*	*0.61*
232813	*VAUGHN*	*0.13*
232919	*VN10*	*0.47*
901004	*W1-003 E*	*0.89*
901014	*W1-004 E*	*0.89*
901024	*W1-005 E*	*0.89*
901034	*W1-006 E*	*0.89*
901411	*W1-062*	*1.9*
907052	*X1-032 E*	*0.79*
907324	*X1-096 E*	*18.29*
910571	*X3-008 C*	*0.27*
910572	*X3-008 E*	*2.68*
910591	*X3-015 C*	*0.25*
910592	*X3-015 E*	*2.52*
910821	*X3-066 C*	*0.14*

910822	*X3-066 E*	*1.41*
913361	*Y1-079 C*	*0.2*
913362	*Y1-079 E*	*1.96*
913411	*Y1-080 C*	*0.04*
913412	*Y1-080 E*	*0.43*
915541	*Y3-058 C*	*0.19*
915542	*Y3-058 E*	*1.86*
920582	*Z1-076 C*	*1.05*
920583	*Z1-076 E*	*1.71*
920592	*Z1-077 C*	*0.75*
920593	*Z1-077 E*	*1.22*
917082	*Z2-012 E*	*2.45*
920763	*Z2-076 E*	*0.4*
920773	*Z2-077 E*	*0.4*
920812	*Z2-097 C*	*1.57*
920813	*Z2-097 E*	*0.65*
921122	*AA1-059 C*	*0.85*
921123	*AA1-059 E*	*0.33*
921142	*AA1-061 C*	*2.88*
921143	*AA1-061 E*	*1.42*
921442	*AA1-110 C*	*1.78*
921443	*AA1-110 E*	*0.89*
921592	*AA1-140 C*	*1.52*
921593	*AA1-140 E*	*2.47*
921602	*AA1-141 C*	*1.13*
921603	*AA1-141 E*	*1.84*
921872	*AA2-069*	*104.94*
922213	*AA2-129 E*	*3.94*
922222	*AA2-130*	*0.39*
922752	*AB1-056 C OP*	*12.81*
922753	*AB1-056 E OP*	*36.48*
922762	*AB1-057 C*	*13.01*
922763	*AB1-057 E*	*37.07*
923282	*AB1-137 C*	*0.84*
923283	*AB1-137 E*	*0.36*
923322	*AB1-141 C OP*	*5.3*
923323	*AB1-141 E OP*	*2.47*
923332	*AB1-142 C OP*	*5.3*
923333	*AB1-142 E OP*	*2.47*
923452	*AB1-162 C OP*	*2.4*
923453	*AB1-162 E OP*	*3.92*
923602	*AB1-176 C*	*1.29*
923603	*AB1-176 E*	*2.12*
923902	*AB2-030 E*	*0.79*
923921	*AB2-032 C*	*5.34*

923922	*AB2-032 E*	*2.51*
923931	*AB2-033 C*	*1.41*
923932	*AB2-033 E*	*0.56*
923951	*AB2-036 C*	*11.73*
923952	*AB2-036 E*	*19.19*
923961	*AB2-037 C*	*12.75*
923962	*AB2-037 E*	*20.82*
924191	*AB2-063 C*	*2.87*
924192	*AB2-063 E*	*4.69*
924361	*AB2-084 C*	*0.75*
924362	*AB2-084 E*	*1.22*
924681	*AB2-120 C OP*	*7.49*
924682	*AB2-120 E OP*	*12.23*
924781	*AB2-130 C OP*	*6.58*
924782	*AB2-130 E OP*	*10.74*
924801	*AB2-133 C OP*	*10.92*
924802	*AB2-133 E OP*	*13.86*
924821	*AB2-135 C*	*12.06*
924822	*AB2-135 E*	*13.76*
924831	*AB2-136 C OP*	*5.2*
924832	*AB2-136 E OP*	*5.51*
924881	*AB2-142 C*	*1.14*
924882	*AB2-142 E*	*1.85*
924971	*AB2-153 C*	*2.98*
924972	*AB2-153 E*	*4.87*
925091	*AB2-166 C*	*0.4*
925092	*AB2-166 E*	*0.7*
925101	*AB2-167 C*	*1.05*
925102	*AB2-167 E*	*1.72*
925151	*AB2-172 C OP*	*4.11*
925152	*AB2-172 E OP*	*6.71*
925231	*AB2-177 C*	*0.49*
925232	*AB2-177 E*	*0.81*
925251	*AB2-179 C OP*	*26.3*
925252	*AB2-179 E OP*	*8.67*
925261	*AB2-180 C*	*2.8*
925262	*AB2-180 E*	*1.2*
925271	*AB2-185 C OP*	*4.42*
925272	*AB2-185 E OP*	*1.9*
925381	*AC1-009 C*	*1.5*
925382	*AC1-009 E*	*2.45*
925651	*AC1-041 C*	*0.38*
925652	*AC1-041 E*	*0.61*
925731	*AC1-049 C*	*0.3*
925732	*AC1-049 E*	*0.5*

925741	*AC1-050 C*	*0.38*
925742	*AC1-050 E*	*0.62*
925761	*AC1-052 C*	*1.97*
925762	*AC1-052 E*	*0.79*
926131	*AC1-091 C*	*1.65*
926132	*AC1-091 E*	*2.7*
926141	*AC1-092 C*	*1.65*
926142	*AC1-092 E*	*2.7*
926151	*AC1-093 C*	*1.56*
926152	*AC1-093 E*	*2.57*
926161	*AC1-094 C*	*1.32*
926162	*AC1-094 E*	*2.18*
926171	*AC1-095 C*	*1.36*
926172	*AC1-095 E*	*1.03*
926721	*AC1-154 C*	*0.49*
926722	*AC1-154 E*	*0.82*
926911	*AC1-177*	*0.79*
927031	*AC1-190 C*	*7.53*
927032	*AC1-190 E*	*3.23*
927191	*AC1-213 C*	*0.7*
927192	*AC1-213 E*	*0.36*
927241	*AC1-220 C OP*	*5.86*
927242	*AC1-220 E OP*	*4.16*
927272	*AC1-224 E*	*0.63*
927311	*AC1-228 C*	*0.24*
927312	*AC1-228 E*	*0.41*
927321	*AC1-229 C*	*0.76*
927322	*AC1-229 E*	*1.24*

Appendix 4

(DP&L - DP&L) The KENT-NMEREDTH 69 kV line (from bus 232215 to bus 232812 ckt 1) loads from 143.88% to 146.67% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 2.59 MW to the thermal violation.

CONTINGENCY 'DBL_4NC' /* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*1.64*
931162	*AC2-023 E*	*3.09*
932631	*AC2-185 C*	*2.24*

932632	*AC2-185 E*	*3.66*
932641	*AC2-186 C*	*0.49*
932642	*AC2-186 E*	*0.8*
932651	*AC2-187 C OP*	*1.42*
932652	*AC2-187 E OP*	*2.31*
932661	*AC2-188 C*	*0.99*
932662	*AC2-188 E*	*1.61*
932671	*AC2-189 C1 O*	*0.04*
932673	*AC2-189 C2 O*	*0.62*
932672	*AC2-189 E O*	*0.08*
932691	*AC2-191*	*1.52*
232900	*DEMECSMY*	*1.37*
232851	*DUP-SFR1*	*0.17*
232923	*MR1*	*1.32*
232924	*MR2*	*1.32*
232910	*NRG_G1*	*2.52*
232911	*NRG_G2*	*2.52*
297077	*V2-028 E*	*0.2*
904212	*V4-022 E*	*0.21*
232813	*VAUGHN*	*0.14*
901004	*W1-003 E*	*0.3*
901014	*W1-004 E*	*0.3*
901024	*W1-005 E*	*0.3*
901034	*W1-006 E*	*0.3*
901411	*W1-062*	*1.46*
907052	*X1-032 E*	*0.26*
907324	*X1-096 E*	*5.96*
913412	*Y1-080 E*	*0.11*
915542	*Y3-058 E*	*0.6*
920582	*Z1-076 C*	*0.36*
920583	*Z1-076 E*	*0.58*
920592	*Z1-077 C*	*0.25*
920593	*Z1-077 E*	*0.41*
917082	*Z2-012 E*	*0.82*
920763	*Z2-076 E*	*0.15*
920773	*Z2-077 E*	*0.15*
921122	*AA1-059 C*	*0.28*
921123	*AA1-059 E*	*0.11*
921592	*AA1-140 C*	*0.58*
921593	*AA1-140 E*	*0.95*
921602	*AA1-141 C*	*0.38*
921603	*AA1-141 E*	*0.62*
921872	*AA2-069*	*41.16*
922213	*AA2-129 E*	*1.33*
922222	*AA2-130*	*0.13*

922752	*AB1-056 C OP*	*4.98*
922753	*AB1-056 E OP*	*14.19*
922762	*AB1-057 C*	*5.06*
922763	*AB1-057 E*	*14.42*
923282	*AB1-137 C*	*0.33*
923283	*AB1-137 E*	*0.14*
923902	*AB2-030 E*	*0.27*
923931	*AB2-033 C*	*0.47*
923932	*AB2-033 E*	*0.19*
924361	*AB2-084 C*	*0.25*
924362	*AB2-084 E*	*0.4*
924681	*AB2-120 C OP*	*2.53*
924682	*AB2-120 E OP*	*4.12*
924781	*AB2-130 C OP*	*2.66*
924782	*AB2-130 E OP*	*4.34*
925091	*AB2-166 C*	*0.14*
925092	*AB2-166 E*	*0.24*
925101	*AB2-167 C*	*0.35*
925102	*AB2-167 E*	*0.58*
925231	*AB2-177 C*	*0.17*
925232	*AB2-177 E*	*0.28*
925261	*AB2-180 C*	*0.9*
925262	*AB2-180 E*	*0.38*
925381	*AC1-009 C*	*0.5*
925382	*AC1-009 E*	*0.82*
925651	*AC1-041 C*	*0.13*
925652	*AC1-041 E*	*0.21*
925731	*AC1-049 C*	*0.12*
925732	*AC1-049 E*	*0.19*
925741	*AC1-050 C*	*0.11*
925742	*AC1-050 E*	*0.18*
925761	*AC1-052 C*	*0.66*
925762	*AC1-052 E*	*0.27*
926131	*AC1-091 C*	*1.11*
926132	*AC1-091 E*	*1.82*
926141	*AC1-092 C*	*1.11*
926142	*AC1-092 E*	*1.82*
926151	*AC1-093 C*	*1.05*
926152	*AC1-093 E*	*1.73*
926161	*AC1-094 C*	*0.89*
926162	*AC1-094 E*	*1.46*
926171	*AC1-095 C*	*0.92*
926172	*AC1-095 E*	*0.69*
926911	*AC1-177*	*0.26*
927191	*AC1-213 C*	*0.23*

927192	*AC1-213 E*	*0.12*
927321	*AC1-229 C*	*0.3*
927322	*AC1-229 E*	*0.49*

Appendix 5

(DP&L - DP&L) The NMEREDTH-AB2-135 TAP 69 kV line (from bus 232812 to bus 924820 ckt 1) loads from 118.72% to 121.51% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 2.59 MW to the thermal violation.

CONTINGENCY 'DBL_4NC' /* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*1.64*
931162	*AC2-023 E*	*3.09*
932631	*AC2-185 C*	*2.24*
932632	*AC2-185 E*	*3.66*
932641	*AC2-186 C*	*0.49*
932642	*AC2-186 E*	*0.8*
932651	*AC2-187 C OP*	*1.42*
932652	*AC2-187 E OP*	*2.31*
932661	*AC2-188 C*	*0.99*
932662	*AC2-188 E*	*1.61*
932671	*AC2-189 C1 O*	*0.04*
932673	*AC2-189 C2 O*	*0.62*
932672	*AC2-189 E O*	*0.08*
932691	*AC2-191*	*1.52*
232900	*DEMECSMY*	*1.37*
232851	*DUP-SFR1*	*0.17*
232923	*MR1*	*1.32*
232924	*MR2*	*1.32*
232910	*NRG_G1*	*2.52*
232911	*NRG_G2*	*2.52*
297077	*V2-028 E*	*0.2*
904212	*V4-022 E*	*0.21*
232813	*VAUGHN*	*0.14*
901004	*W1-003 E*	*0.3*
901014	*W1-004 E*	*0.3*
901024	*W1-005 E*	*0.3*
901034	*W1-006 E*	*0.3*
901411	*W1-062*	*1.46*

907052	*X1-032 E*	*0.26*
907324	*X1-096 E*	*5.96*
913412	*Y1-080 E*	*0.11*
915542	*Y3-058 E*	*0.6*
920582	*Z1-076 C*	*0.36*
920583	*Z1-076 E*	*0.58*
920592	*Z1-077 C*	*0.25*
920593	*Z1-077 E*	*0.41*
917082	*Z2-012 E*	*0.82*
920763	*Z2-076 E*	*0.15*
920773	*Z2-077 E*	*0.15*
921122	*AA1-059 C*	*0.28*
921123	*AA1-059 E*	*0.11*
921592	*AA1-140 C*	*0.58*
921593	*AA1-140 E*	*0.95*
921602	*AA1-141 C*	*0.38*
921603	*AA1-141 E*	*0.62*
921872	*AA2-069*	*41.16*
922213	*AA2-129 E*	*1.33*
922222	*AA2-130*	*0.13*
922752	*AB1-056 C OP*	*4.98*
922753	*AB1-056 E OP*	*14.19*
922762	*AB1-057 C*	*5.06*
922763	*AB1-057 E*	*14.42*
923282	*AB1-137 C*	*0.33*
923283	*AB1-137 E*	*0.14*
923902	*AB2-030 E*	*0.27*
923931	*AB2-033 C*	*0.47*
923932	*AB2-033 E*	*0.19*
924361	*AB2-084 C*	*0.25*
924362	*AB2-084 E*	*0.4*
924681	*AB2-120 C OP*	*2.53*
924682	*AB2-120 E OP*	*4.12*
924781	*AB2-130 C OP*	*2.66*
924782	*AB2-130 E OP*	*4.34*
925091	*AB2-166 C*	*0.14*
925092	*AB2-166 E*	*0.24*
925101	*AB2-167 C*	*0.35*
925102	*AB2-167 E*	*0.58*
925231	*AB2-177 C*	*0.17*
925232	*AB2-177 E*	*0.28*
925261	*AB2-180 C*	*0.9*
925262	*AB2-180 E*	*0.38*
925381	*AC1-009 C*	*0.5*
925382	*AC1-009 E*	*0.82*

925651	*AC1-041 C*	*0.13*
925652	*AC1-041 E*	*0.21*
925731	*AC1-049 C*	*0.12*
925732	*AC1-049 E*	*0.19*
925741	*AC1-050 C*	*0.11*
925742	*AC1-050 E*	*0.18*
925761	*AC1-052 C*	*0.66*
925762	*AC1-052 E*	*0.27*
926131	*AC1-091 C*	*1.11*
926132	*AC1-091 E*	*1.82*
926141	*AC1-092 C*	*1.11*
926142	*AC1-092 E*	*1.82*
926151	*AC1-093 C*	*1.05*
926152	*AC1-093 E*	*1.73*
926161	*AC1-094 C*	*0.89*
926162	*AC1-094 E*	*1.46*
926171	*AC1-095 C*	*0.92*
926172	*AC1-095 E*	*0.69*
926911	*AC1-177*	*0.26*
927191	*AC1-213 C*	*0.23*
927192	*AC1-213 E*	*0.12*
927321	*AC1-229 C*	*0.3*
927322	*AC1-229 E*	*0.49*

Appendix 6

(DP&L - DP&L) The AB2-037 TAP-KEEN_230 230 kV line (from bus 923960 to bus 231003 ckt 2) loads from 101.38% to 101.93% (DC power flow) of its emergency rating (727 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 8.9 MW to the thermal violation.

```
CONTINGENCY 'DBL_4NC'                                   /* RED LION-CEDAR CREEK
230;RED LION-CARTANZA 230
  OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
  OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
  END
```

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*12.*
931162	*AC2-023 E*	*22.65*
932631	*AC2-185 C*	*6.72*
932632	*AC2-185 E*	*10.96*
932641	*AC2-186 C*	*1.69*
932642	*AC2-186 E*	*2.76*
932651	*AC2-187 C OP*	*3.31*
932652	*AC2-187 E OP*	*5.39*

932661	*AC2-188 C*	*3.38*
932662	*AC2-188 E*	*5.52*
932671	*AC2-189 C1 O*	*0.32*
932673	*AC2-189 C2 O*	*4.37*
932672	*AC2-189 E O*	*0.59*
932691	*AC2-191*	*8.7*
232926	*CRISFLD1*	*0.74*
232923	*MR1*	*7.73*
232924	*MR2*	*7.73*
232912	*OH NUG1*	*3.34*
232913	*OH NUG2*	*3.3*
232914	*OH NUG3*	*3.34*
232915	*OH NUG4*	*3.34*
232916	*OH NUG5*	*3.34*
232917	*OH NUG6*	*3.33*
232918	*OH NUG7*	*3.32*
232921	*TASLEY2G*	*2.29*
297077	*V2-028 E*	*1.68*
904212	*V4-022 E*	*1.41*
232907	*VN8*	*11.43*
901003	*W1-003 C*	*0.21*
901004	*W1-003 E*	*2.07*
901013	*W1-004 C*	*0.21*
901014	*W1-004 E*	*2.07*
901023	*W1-005 C*	*0.21*
901024	*W1-005 E*	*2.07*
901033	*W1-006 C*	*< 0.01*
901034	*W1-006 E*	*2.07*
907052	*X1-032 E*	*1.82*
907323	*X1-096 C*	*1.45*
907324	*X1-096 E*	*42.34*
910572	*X3-008 E*	*5.51*
910592	*X3-015 E*	*5.42*
910822	*X3-066 E*	*1.31*
913362	*Y1-079 E*	*2.4*
913412	*Y1-080 E*	*0.94*
915542	*Y3-058 E*	*4.22*
920582	*Z1-076 C*	*2.42*
920583	*Z1-076 E*	*3.95*
920592	*Z1-077 C*	*1.73*
920593	*Z1-077 E*	*2.82*
916441	*Z1-100*	*0.31*
916451	*Z1-101*	*0.31*
916461	*Z1-102*	*0.31*
920602	*Z1-103*	*0.31*

917082	*Z2-012 E*	*5.64*
920763	*Z2-076 E*	*0.91*
920773	*Z2-077 E*	*0.91*
920812	*Z2-097 C*	*1.11*
920813	*Z2-097 E*	*0.46*
920952	*AA1-025*	*0.28*
920962	*AA1-026*	*0.28*
920972	*AA1-027*	*0.28*
920982	*AA1-028*	*0.28*
921122	*AA1-059 C*	*1.96*
921123	*AA1-059 E*	*0.77*
921142	*AA1-061 C*	*5.96*
921143	*AA1-061 E*	*2.94*
918831	*AA1-102*	*2.79*
921442	*AA1-110 C*	*1.25*
921443	*AA1-110 E*	*0.63*
921592	*AA1-140 C*	*3.45*
921593	*AA1-140 E*	*5.63*
921602	*AA1-141 C*	*2.59*
921603	*AA1-141 E*	*4.23*
921872	*AA2-069*	*240.92*
922213	*AA2-129 E*	*9.1*
922222	*AA2-130*	*0.91*
922752	*AB1-056 C OP*	*29.24*
922753	*AB1-056 E OP*	*83.27*
922762	*AB1-057 C*	*29.69*
922763	*AB1-057 E*	*84.63*
923282	*AB1-137 C*	*1.91*
923283	*AB1-137 E*	*0.82*
923322	*AB1-141 C OP*	*4.63*
923323	*AB1-141 E OP*	*2.16*
923332	*AB1-142 C OP*	*4.63*
923333	*AB1-142 E OP*	*2.16*
923452	*AB1-162 C OP*	*2.23*
923453	*AB1-162 E OP*	*3.64*
923602	*AB1-176 C*	*1.19*
923603	*AB1-176 E*	*1.97*
923902	*AB2-030 E*	*1.82*
923921	*AB2-032 C*	*4.66*
923922	*AB2-032 E*	*2.19*
923931	*AB2-033 C*	*3.26*
923932	*AB2-033 E*	*1.29*
923951	*AB2-036 C*	*15.26*
923952	*AB2-036 E*	*24.95*
923961	*AB2-037 C*	*42.83*

923962	*AB2-037 E*	*69.96*
924191	*AB2-063 C*	*2.67*
924192	*AB2-063 E*	*4.35*
924361	*AB2-084 C*	*1.73*
924362	*AB2-084 E*	*2.82*
924681	*AB2-120 C OP*	*17.29*
924682	*AB2-120 E OP*	*28.21*
924781	*AB2-130 C OP*	*14.58*
924782	*AB2-130 E OP*	*23.78*
924801	*AB2-133 C OP*	*7.71*
924802	*AB2-133 E OP*	*9.78*
924821	*AB2-135 C*	*10.07*
924822	*AB2-135 E*	*11.48*
924831	*AB2-136 C OP*	*11.11*
924832	*AB2-136 E OP*	*11.78*
924881	*AB2-142 C*	*2.24*
924882	*AB2-142 E*	*3.65*
924971	*AB2-153 C*	*2.61*
924972	*AB2-153 E*	*4.25*
925091	*AB2-166 C*	*0.91*
925092	*AB2-166 E*	*1.59*
925101	*AB2-167 C*	*2.41*
925102	*AB2-167 E*	*3.96*
925151	*AB2-172 C OP*	*8.44*
925152	*AB2-172 E OP*	*13.76*
925231	*AB2-177 C*	*1.14*
925232	*AB2-177 E*	*1.86*
925261	*AB2-180 C*	*6.35*
925262	*AB2-180 E*	*2.72*
925271	*AB2-185 C OP*	*5.42*
925272	*AB2-185 E OP*	*2.32*
925381	*AC1-009 C*	*3.46*
925382	*AC1-009 E*	*5.64*
925651	*AC1-041 C*	*0.86*
925652	*AC1-041 E*	*1.41*
925731	*AC1-049 C*	*0.68*
925732	*AC1-049 E*	*1.13*
925741	*AC1-050 C*	*0.86*
925742	*AC1-050 E*	*1.4*
925761	*AC1-052 C*	*4.55*
925762	*AC1-052 E*	*1.82*
926131	*AC1-091 C*	*3.32*
926132	*AC1-091 E*	*5.44*
926141	*AC1-092 C*	*3.32*
926142	*AC1-092 E*	*5.44*

926151	*AC1-093 C*	*3.14*
926152	*AC1-093 E*	*5.17*
926161	*AC1-094 C*	*2.65*
926162	*AC1-094 E*	*4.38*
926171	*AC1-095 C*	*2.74*
926172	*AC1-095 E*	*2.08*
926721	*AC1-154 C*	*0.4*
926722	*AC1-154 E*	*0.67*
926911	*AC1-177*	*1.82*
927031	*AC1-190 C*	*15.56*
927032	*AC1-190 E*	*6.67*
927191	*AC1-213 C*	*1.59*
927192	*AC1-213 E*	*0.82*
927241	*AC1-220 C OP*	*5.44*
927242	*AC1-220 E OP*	*3.86*
927272	*AC1-224 E*	*0.77*
927311	*AC1-228 C*	*0.49*
927312	*AC1-228 E*	*0.84*
927321	*AC1-229 C*	*1.72*
927322	*AC1-229 E*	*2.81*

Appendix 7

(DP&L - DP&L) The AB2-135 TAP-CHURC_69 69 kV line (from bus 924820 to bus 232203 ckt 1) loads from 169.42% to 172.21% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 2.59 MW to the thermal violation.

```
CONTINGENCY 'DBL_4NC'                          /* RED LION-CEDAR CREEK
230;RED LION-CARTANZA 230
  OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
  OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
  END
```

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*1.64*
931162	*AC2-023 E*	*3.09*
932631	*AC2-185 C*	*2.24*
932632	*AC2-185 E*	*3.66*
932641	*AC2-186 C*	*0.49*
932642	*AC2-186 E*	*0.8*
932651	*AC2-187 C OP*	*1.42*
932652	*AC2-187 E OP*	*2.31*
932661	*AC2-188 C*	*0.99*
932662	*AC2-188 E*	*1.61*
932671	*AC2-189 C1 O*	*0.04*

932673	*AC2-189 C2 O*	*0.62*
932672	*AC2-189 E O*	*0.08*
932691	*AC2-191*	*1.52*
232900	*DEMECSMY*	*1.37*
232851	*DUP-SFR1*	*0.17*
232923	*MR1*	*1.32*
232924	*MR2*	*1.32*
232910	*NRG_G1*	*2.52*
232911	*NRG_G2*	*2.52*
904212	*V4-022 E*	*0.21*
232813	*VAUGHN*	*0.14*
901004	*W1-003 E*	*0.3*
901014	*W1-004 E*	*0.3*
901024	*W1-005 E*	*0.3*
901034	*W1-006 E*	*0.3*
901411	*W1-062*	*1.46*
907052	*X1-032 E*	*0.26*
907324	*X1-096 E*	*5.96*
915542	*Y3-058 E*	*0.6*
920582	*Z1-076 C*	*0.36*
920583	*Z1-076 E*	*0.58*
920592	*Z1-077 C*	*0.25*
920593	*Z1-077 E*	*0.41*
917082	*Z2-012 E*	*0.82*
920763	*Z2-076 E*	*0.15*
920773	*Z2-077 E*	*0.15*
921122	*AA1-059 C*	*0.28*
921123	*AA1-059 E*	*0.11*
921592	*AA1-140 C*	*0.58*
921593	*AA1-140 E*	*0.95*
921602	*AA1-141 C*	*0.38*
921603	*AA1-141 E*	*0.62*
921872	*AA2-069*	*41.16*
922213	*AA2-129 E*	*1.33*
922222	*AA2-130*	*0.13*
922752	*AB1-056 C OP*	*4.98*
922753	*AB1-056 E OP*	*14.19*
922762	*AB1-057 C*	*5.06*
922763	*AB1-057 E*	*14.42*
923282	*AB1-137 C*	*0.33*
923283	*AB1-137 E*	*0.14*
923902	*AB2-030 E*	*0.27*
923931	*AB2-033 C*	*0.47*
923932	*AB2-033 E*	*0.19*
924361	*AB2-084 C*	*0.25*

924362	*AB2-084 E*	*0.4*
924681	*AB2-120 C OP*	*2.53*
924682	*AB2-120 E OP*	*4.12*
924781	*AB2-130 C OP*	*2.66*
924782	*AB2-130 E OP*	*4.34*
924821	*AB2-135 C*	*22.27*
924822	*AB2-135 E*	*25.39*
925091	*AB2-166 C*	*0.14*
925092	*AB2-166 E*	*0.24*
925101	*AB2-167 C*	*0.35*
925102	*AB2-167 E*	*0.58*
925231	*AB2-177 C*	*0.17*
925232	*AB2-177 E*	*0.28*
925261	*AB2-180 C*	*0.9*
925262	*AB2-180 E*	*0.38*
925381	*AC1-009 C*	*0.5*
925382	*AC1-009 E*	*0.82*
925651	*AC1-041 C*	*0.13*
925652	*AC1-041 E*	*0.21*
925731	*AC1-049 C*	*0.12*
925732	*AC1-049 E*	*0.19*
925761	*AC1-052 C*	*0.66*
925762	*AC1-052 E*	*0.27*
926131	*AC1-091 C*	*1.11*
926132	*AC1-091 E*	*1.82*
926141	*AC1-092 C*	*1.11*
926142	*AC1-092 E*	*1.82*
926151	*AC1-093 C*	*1.05*
926152	*AC1-093 E*	*1.73*
926161	*AC1-094 C*	*0.89*
926162	*AC1-094 E*	*1.46*
926171	*AC1-095 C*	*0.92*
926172	*AC1-095 E*	*0.69*
926911	*AC1-177*	*0.26*
927191	*AC1-213 C*	*0.23*
927192	*AC1-213 E*	*0.12*
927321	*AC1-229 C*	*0.3*
927322	*AC1-229 E*	*0.49*

Secondary Point of Interconnection

Appendix 1

(DP&L - DP&L) The MILF_230-STEELE 230 kV line (from bus 232004 to bus 232000 ckt 1) loads from 186.08% to 187.06% (DC power flow) of its emergency rating (551 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 12.02 MW to the thermal violation.

CONTINGENCY 'DBL_4NC' /* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*11.13*
931162	*AC2-023 E*	*20.99*
932631	*AC2-185 C*	*10.11*
932632	*AC2-185 E*	*16.5*
932641	*AC2-186 C*	*2.28*
932642	*AC2-186 E*	*3.73*
932651	*AC2-187 C OP*	*4.98*
932652	*AC2-187 E OP*	*8.12*
932661	*AC2-188 C*	*4.57*
932662	*AC2-188 E*	*7.45*
932671	*AC2-189 C1 O*	*0.32*
932673	*AC2-189 C2 O*	*4.43*
932672	*AC2-189 E O*	*0.6*
932691	*AC2-191*	*11.84*
232900	*DEMECSMY*	*5.*
232616	*GEN FOOD*	*1.83*
232904	*IR4*	*44.03*
232923	*MR1*	*12.52*
232924	*MR2*	*12.52*
232922	*MR3*	*12.28*
232901	*NORTHST*	*5.42*
297077	*V2-028 E*	*1.28*
904212	*V4-022 E*	*1.52*
901004	*W1-003 E*	*2.22*
901014	*W1-004 E*	*2.22*
901024	*W1-005 E*	*2.22*
901034	*W1-006 E*	*2.22*
901411	*W1-062*	*5.31*
903511	*W3-032A*	*37.21*
907052	*X1-032 E*	*1.89*
907324	*X1-096 E*	*42.95*
910572	*X3-008 E*	*3.32*

910592	*X3-015 E*	*3.8*
913412	*Y1-080 E*	*0.68*
915542	*Y3-058 E*	*4.1*
920582	*Z1-076 C*	*2.63*
920583	*Z1-076 E*	*4.3*
920592	*Z1-077 C*	*1.88*
920593	*Z1-077 E*	*3.07*
917082	*Z2-012 E*	*6.09*
920763	*Z2-076 E*	*1.22*
920773	*Z2-077 E*	*1.22*
921122	*AA1-059 C*	*1.99*
921123	*AA1-059 E*	*0.79*
921142	*AA1-061 C*	*3.72*
921143	*AA1-061 E*	*1.83*
921592	*AA1-140 C*	*4.6*
921593	*AA1-140 E*	*7.51*
921602	*AA1-141 C*	*2.84*
921603	*AA1-141 E*	*4.63*
921872	*AA2-069*	*390.46*
922213	*AA2-129 E*	*9.83*
922222	*AA2-130*	*0.92*
922752	*AB1-056 C OP*	*41.89*
922753	*AB1-056 E OP*	*119.28*
922762	*AB1-057 C*	*42.54*
922763	*AB1-057 E*	*121.23*
923282	*AB1-137 C*	*2.63*
923283	*AB1-137 E*	*1.13*
923902	*AB2-030 E*	*1.96*
923931	*AB2-033 C*	*3.52*
923932	*AB2-033 E*	*1.39*
924361	*AB2-084 C*	*1.79*
924362	*AB2-084 E*	*2.93*
924681	*AB2-120 C OP*	*18.78*
924682	*AB2-120 E OP*	*30.64*
924781	*AB2-130 C OP*	*16.78*
924782	*AB2-130 E OP*	*27.37*
924831	*AB2-136 C OP*	*7.6*
924832	*AB2-136 E OP*	*8.06*
925091	*AB2-166 C*	*0.95*
925092	*AB2-166 E*	*1.66*
925101	*AB2-167 C*	*2.63*
925102	*AB2-167 E*	*4.31*
925151	*AB2-172 C OP*	*5.08*
925152	*AB2-172 E OP*	*8.29*
925231	*AB2-177 C*	*1.25*

925232	*AB2-177 E*	*2.04*
925261	*AB2-180 C*	*6.18*
925262	*AB2-180 E*	*2.65*
925381	*AC1-009 C*	*3.73*
925382	*AC1-009 E*	*6.09*
925651	*AC1-041 C*	*0.95*
925652	*AC1-041 E*	*1.55*
925731	*AC1-049 C*	*0.91*
925732	*AC1-049 E*	*1.51*
925741	*AC1-050 C*	*0.74*
925742	*AC1-050 E*	*1.21*
925761	*AC1-052 C*	*4.91*
925762	*AC1-052 E*	*1.96*
926131	*AC1-091 C*	*4.99*
926132	*AC1-091 E*	*8.18*
926141	*AC1-092 C*	*4.99*
926142	*AC1-092 E*	*8.18*
926151	*AC1-093 C*	*4.72*
926152	*AC1-093 E*	*7.78*
926161	*AC1-094 C*	*3.99*
926162	*AC1-094 E*	*6.59*
926171	*AC1-095 C*	*4.12*
926172	*AC1-095 E*	*3.13*
926911	*AC1-177*	*1.85*
927031	*AC1-190 C*	*9.6*
927032	*AC1-190 E*	*4.11*
927191	*AC1-213 C*	*1.65*
927192	*AC1-213 E*	*0.85*
927311	*AC1-228 C*	*0.29*
927312	*AC1-228 E*	*0.51*
927321	*AC1-229 C*	*2.39*
927322	*AC1-229 E*	*3.89*

Appendix 2

(DP&L - DP&L) The MIDLTNTP-MT PLSNT 138 kV line (from bus 232106 to bus 232104 ckt 1) loads from 117.14% to 118.48% (DC power flow) of its emergency rating (348 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 4.65 MW to the thermal violation.

```
CONTINGENCY 'DBL_4NC'                                   /* RED LION-CEDAR CREEK
230;RED LION-CARTANZA 230
  OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
  OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
  END
```

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*5.32*
931162	*AC2-023 E*	*10.04*
932631	*AC2-185 C*	*3.34*
932632	*AC2-185 E*	*5.45*
932641	*AC2-186 C*	*0.88*
932642	*AC2-186 E*	*1.44*
932651	*AC2-187 C OP*	*1.63*
932652	*AC2-187 E OP*	*2.66*
932661	*AC2-188 C*	*1.77*
932662	*AC2-188 E*	*2.88*
932671	*AC2-189 C1 O*	*0.14*
932673	*AC2-189 C2 O*	*1.89*
932672	*AC2-189 E O*	*0.26*
932691	*AC2-191*	*3.85*
232900	*DEMECSMY*	*1.79*
232851	*DUP-SFR1*	*0.34*
232902	*EASTMUNI*	*2.84*
232923	*MR1*	*3.37*
232924	*MR2*	*3.37*
232910	*NRG_G1*	*2.03*
232911	*NRG_G2*	*2.03*
292089	*T-011*	*0.14*
297076	*V2-028 C*	*0.08*
297077	*V2-028 E*	*0.75*
904212	*V4-022 E*	*0.61*
232813	*VAUGHN*	*0.13*
232919	*VN10*	*0.47*
901004	*W1-003 E*	*0.89*
901014	*W1-004 E*	*0.89*
901024	*W1-005 E*	*0.89*
901034	*W1-006 E*	*0.89*
901411	*W1-062*	*1.9*
907052	*X1-032 E*	*0.79*
907324	*X1-096 E*	*18.29*
910571	*X3-008 C*	*0.27*
910572	*X3-008 E*	*2.68*
910591	*X3-015 C*	*0.25*
910592	*X3-015 E*	*2.52*
910821	*X3-066 C*	*0.14*
910822	*X3-066 E*	*1.41*
913361	*Y1-079 C*	*0.2*
913362	*Y1-079 E*	*1.96*
913411	*Y1-080 C*	*0.04*
913412	*Y1-080 E*	*0.43*

915541	*Y3-058 C*	*0.19*
915542	*Y3-058 E*	*1.86*
920582	*Z1-076 C*	*1.05*
920583	*Z1-076 E*	*1.71*
920592	*Z1-077 C*	*0.75*
920593	*Z1-077 E*	*1.22*
917082	*Z2-012 E*	*2.45*
920763	*Z2-076 E*	*0.4*
920773	*Z2-077 E*	*0.4*
920812	*Z2-097 C*	*1.57*
920813	*Z2-097 E*	*0.65*
921122	*AA1-059 C*	*0.85*
921123	*AA1-059 E*	*0.33*
921142	*AA1-061 C*	*2.88*
921143	*AA1-061 E*	*1.42*
921442	*AA1-110 C*	*1.78*
921443	*AA1-110 E*	*0.89*
921592	*AA1-140 C*	*1.52*
921593	*AA1-140 E*	*2.47*
921602	*AA1-141 C*	*1.13*
921603	*AA1-141 E*	*1.84*
921872	*AA2-069*	*104.94*
922213	*AA2-129 E*	*3.94*
922222	*AA2-130*	*0.39*
922752	*AB1-056 C OP*	*12.81*
922753	*AB1-056 E OP*	*36.48*
922762	*AB1-057 C*	*13.01*
922763	*AB1-057 E*	*37.07*
923282	*AB1-137 C*	*0.84*
923283	*AB1-137 E*	*0.36*
923322	*AB1-141 C OP*	*5.3*
923323	*AB1-141 E OP*	*2.47*
923332	*AB1-142 C OP*	*5.3*
923333	*AB1-142 E OP*	*2.47*
923452	*AB1-162 C OP*	*2.4*
923453	*AB1-162 E OP*	*3.92*
923602	*AB1-176 C*	*1.29*
923603	*AB1-176 E*	*2.12*
923902	*AB2-030 E*	*0.79*
923921	*AB2-032 C*	*5.34*
923922	*AB2-032 E*	*2.51*
923931	*AB2-033 C*	*1.41*
923932	*AB2-033 E*	*0.56*
923951	*AB2-036 C*	*11.73*
923952	*AB2-036 E*	*19.19*

923961	*AB2-037 C*	*12.75*
923962	*AB2-037 E*	*20.82*
924191	*AB2-063 C*	*2.87*
924192	*AB2-063 E*	*4.69*
924361	*AB2-084 C*	*0.75*
924362	*AB2-084 E*	*1.22*
924681	*AB2-120 C OP*	*7.49*
924682	*AB2-120 E OP*	*12.23*
924781	*AB2-130 C OP*	*6.58*
924782	*AB2-130 E OP*	*10.74*
924801	*AB2-133 C OP*	*10.92*
924802	*AB2-133 E OP*	*13.86*
924821	*AB2-135 C*	*12.06*
924822	*AB2-135 E*	*13.76*
924831	*AB2-136 C OP*	*5.2*
924832	*AB2-136 E OP*	*5.51*
924881	*AB2-142 C*	*1.14*
924882	*AB2-142 E*	*1.85*
924971	*AB2-153 C*	*2.98*
924972	*AB2-153 E*	*4.87*
925091	*AB2-166 C*	*0.4*
925092	*AB2-166 E*	*0.7*
925101	*AB2-167 C*	*1.05*
925102	*AB2-167 E*	*1.72*
925151	*AB2-172 C OP*	*4.11*
925152	*AB2-172 E OP*	*6.71*
925231	*AB2-177 C*	*0.49*
925232	*AB2-177 E*	*0.81*
925251	*AB2-179 C OP*	*26.3*
925252	*AB2-179 E OP*	*8.67*
925261	*AB2-180 C*	*2.8*
925262	*AB2-180 E*	*1.2*
925271	*AB2-185 C OP*	*4.42*
925272	*AB2-185 E OP*	*1.9*
925381	*AC1-009 C*	*1.5*
925382	*AC1-009 E*	*2.45*
925651	*AC1-041 C*	*0.38*
925652	*AC1-041 E*	*0.61*
925731	*AC1-049 C*	*0.3*
925732	*AC1-049 E*	*0.5*
925741	*AC1-050 C*	*0.38*
925742	*AC1-050 E*	*0.62*
925761	*AC1-052 C*	*1.97*
925762	*AC1-052 E*	*0.79*
926131	*AC1-091 C*	*1.65*

926132	*AC1-091 E*	*2.7*
926141	*AC1-092 C*	*1.65*
926142	*AC1-092 E*	*2.7*
926151	*AC1-093 C*	*1.56*
926152	*AC1-093 E*	*2.57*
926161	*AC1-094 C*	*1.32*
926162	*AC1-094 E*	*2.18*
926171	*AC1-095 C*	*1.36*
926172	*AC1-095 E*	*1.03*
926721	*AC1-154 C*	*0.49*
926722	*AC1-154 E*	*0.82*
926911	*AC1-177*	*0.79*
927031	*AC1-190 C*	*7.53*
927032	*AC1-190 E*	*3.23*
927191	*AC1-213 C*	*0.7*
927192	*AC1-213 E*	*0.36*
927241	*AC1-220 C OP*	*5.86*
927242	*AC1-220 E OP*	*4.16*
927272	*AC1-224 E*	*0.63*
927311	*AC1-228 C*	*0.24*
927312	*AC1-228 E*	*0.41*
927321	*AC1-229 C*	*0.76*
927322	*AC1-229 E*	*1.24*

Appendix 3

(DP&L - DP&L) The TOWNSEND-MIDLTNTP 138 kV line (from bus 232107 to bus 232106 ckt 1) loads from 127.86% to 129.2% (DC power flow) of its emergency rating (348 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 4.65 MW to the thermal violation.

```
CONTINGENCY 'DBL_4NC'                                   /* RED LION-CEDAR CREEK
230;RED LION-CARTANZA 230
  OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
  OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
  END
```

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*5.32*
931162	*AC2-023 E*	*10.04*
932631	*AC2-185 C*	*3.34*
932632	*AC2-185 E*	*5.45*
932641	*AC2-186 C*	*0.88*
932642	*AC2-186 E*	*1.44*
932651	*AC2-187 C OP*	*1.63*
932652	*AC2-187 E OP*	*2.66*

932661	*AC2-188 C*	*1.77*
932662	*AC2-188 E*	*2.88*
932671	*AC2-189 C1 O*	*0.14*
932673	*AC2-189 C2 O*	*1.89*
932672	*AC2-189 E O*	*0.26*
932691	*AC2-191*	*3.85*
232900	*DEMECSMY*	*1.79*
232851	*DUP-SFR1*	*0.34*
232902	*EASTMUNI*	*2.84*
232923	*MR1*	*3.37*
232924	*MR2*	*3.37*
232910	*NRG_G1*	*2.03*
232911	*NRG_G2*	*2.03*
292089	*T-011*	*0.14*
297076	*V2-028 C*	*0.08*
297077	*V2-028 E*	*0.75*
904212	*V4-022 E*	*0.61*
232813	*VAUGHN*	*0.13*
232919	*VN10*	*0.47*
901004	*W1-003 E*	*0.89*
901014	*W1-004 E*	*0.89*
901024	*W1-005 E*	*0.89*
901034	*W1-006 E*	*0.89*
901411	*W1-062*	*1.9*
907052	*X1-032 E*	*0.79*
907324	*X1-096 E*	*18.29*
910571	*X3-008 C*	*0.27*
910572	*X3-008 E*	*2.68*
910591	*X3-015 C*	*0.25*
910592	*X3-015 E*	*2.52*
910821	*X3-066 C*	*0.14*
910822	*X3-066 E*	*1.41*
913361	*Y1-079 C*	*0.2*
913362	*Y1-079 E*	*1.96*
913411	*Y1-080 C*	*0.04*
913412	*Y1-080 E*	*0.43*
915541	*Y3-058 C*	*0.19*
915542	*Y3-058 E*	*1.86*
920582	*Z1-076 C*	*1.05*
920583	*Z1-076 E*	*1.71*
920592	*Z1-077 C*	*0.75*
920593	*Z1-077 E*	*1.22*
917082	*Z2-012 E*	*2.45*
920763	*Z2-076 E*	*0.4*
920773	*Z2-077 E*	*0.4*

920812	*Z2-097 C*	*1.57*
920813	*Z2-097 E*	*0.65*
921122	*AA1-059 C*	*0.85*
921123	*AA1-059 E*	*0.33*
921142	*AA1-061 C*	*2.88*
921143	*AA1-061 E*	*1.42*
921442	*AA1-110 C*	*1.78*
921443	*AA1-110 E*	*0.89*
921592	*AA1-140 C*	*1.52*
921593	*AA1-140 E*	*2.47*
921602	*AA1-141 C*	*1.13*
921603	*AA1-141 E*	*1.84*
921872	*AA2-069*	*104.94*
922213	*AA2-129 E*	*3.94*
922222	*AA2-130*	*0.39*
922752	*AB1-056 C OP*	*12.81*
922753	*AB1-056 E OP*	*36.48*
922762	*AB1-057 C*	*13.01*
922763	*AB1-057 E*	*37.07*
923282	*AB1-137 C*	*0.84*
923283	*AB1-137 E*	*0.36*
923322	*AB1-141 C OP*	*5.3*
923323	*AB1-141 E OP*	*2.47*
923332	*AB1-142 C OP*	*5.3*
923333	*AB1-142 E OP*	*2.47*
923452	*AB1-162 C OP*	*2.4*
923453	*AB1-162 E OP*	*3.92*
923602	*AB1-176 C*	*1.29*
923603	*AB1-176 E*	*2.12*
923902	*AB2-030 E*	*0.79*
923921	*AB2-032 C*	*5.34*
923922	*AB2-032 E*	*2.51*
923931	*AB2-033 C*	*1.41*
923932	*AB2-033 E*	*0.56*
923951	*AB2-036 C*	*11.73*
923952	*AB2-036 E*	*19.19*
923961	*AB2-037 C*	*12.75*
923962	*AB2-037 E*	*20.82*
924191	*AB2-063 C*	*2.87*
924192	*AB2-063 E*	*4.69*
924361	*AB2-084 C*	*0.75*
924362	*AB2-084 E*	*1.22*
924681	*AB2-120 C OP*	*7.49*
924682	*AB2-120 E OP*	*12.23*
924781	*AB2-130 C OP*	*6.58*

924782	*AB2-130 E OP*	*10.74*
924801	*AB2-133 C OP*	*10.92*
924802	*AB2-133 E OP*	*13.86*
924821	*AB2-135 C*	*12.06*
924822	*AB2-135 E*	*13.76*
924831	*AB2-136 C OP*	*5.2*
924832	*AB2-136 E OP*	*5.51*
924881	*AB2-142 C*	*1.14*
924882	*AB2-142 E*	*1.85*
924971	*AB2-153 C*	*2.98*
924972	*AB2-153 E*	*4.87*
925091	*AB2-166 C*	*0.4*
925092	*AB2-166 E*	*0.7*
925101	*AB2-167 C*	*1.05*
925102	*AB2-167 E*	*1.72*
925151	*AB2-172 C OP*	*4.11*
925152	*AB2-172 E OP*	*6.71*
925231	*AB2-177 C*	*0.49*
925232	*AB2-177 E*	*0.81*
925251	*AB2-179 C OP*	*26.3*
925252	*AB2-179 E OP*	*8.67*
925261	*AB2-180 C*	*2.8*
925262	*AB2-180 E*	*1.2*
925271	*AB2-185 C OP*	*4.42*
925272	*AB2-185 E OP*	*1.9*
925381	*AC1-009 C*	*1.5*
925382	*AC1-009 E*	*2.45*
925651	*AC1-041 C*	*0.38*
925652	*AC1-041 E*	*0.61*
925731	*AC1-049 C*	*0.3*
925732	*AC1-049 E*	*0.5*
925741	*AC1-050 C*	*0.38*
925742	*AC1-050 E*	*0.62*
925761	*AC1-052 C*	*1.97*
925762	*AC1-052 E*	*0.79*
926131	*AC1-091 C*	*1.65*
926132	*AC1-091 E*	*2.7*
926141	*AC1-092 C*	*1.65*
926142	*AC1-092 E*	*2.7*
926151	*AC1-093 C*	*1.56*
926152	*AC1-093 E*	*2.57*
926161	*AC1-094 C*	*1.32*
926162	*AC1-094 E*	*2.18*
926171	*AC1-095 C*	*1.36*
926172	*AC1-095 E*	*1.03*

926721	*AC1-154 C*	*0.49*
926722	*AC1-154 E*	*0.82*
926911	*AC1-177*	*0.79*
927031	*AC1-190 C*	*7.53*
927032	*AC1-190 E*	*3.23*
927191	*AC1-213 C*	*0.7*
927192	*AC1-213 E*	*0.36*
927241	*AC1-220 C OP*	*5.86*
927242	*AC1-220 E OP*	*4.16*
927272	*AC1-224 E*	*0.63*
927311	*AC1-228 C*	*0.24*
927312	*AC1-228 E*	*0.41*
927321	*AC1-229 C*	*0.76*
927322	*AC1-229 E*	*1.24*

Appendix 4

(DP&L - DP&L) The KENT-NMEREDTH 69 kV line (from bus 232215 to bus 232812 ckt 1) loads from 143.28% to 147.28% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 3.73 MW to the thermal violation.

CONTINGENCY 'DBL_4NC' /* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*1.64*
931162	*AC2-023 E*	*3.09*
932631	*AC2-185 C*	*2.24*
932632	*AC2-185 E*	*3.66*
932641	*AC2-186 C*	*0.71*
932642	*AC2-186 E*	*1.16*
932651	*AC2-187 C OP*	*0.99*
932652	*AC2-187 E OP*	*1.61*
932661	*AC2-188 C*	*1.42*
932662	*AC2-188 E*	*2.31*
932671	*AC2-189 C1 O*	*0.04*
932673	*AC2-189 C2 O*	*0.62*
932672	*AC2-189 E O*	*0.08*
932691	*AC2-191*	*1.52*
232900	*DEMECSMY*	*1.37*
232851	*DUP-SFR1*	*0.17*
232923	*MR1*	*1.32*

232924	*MR2*	*1.32*
232910	*NRG_G1*	*2.52*
232911	*NRG_G2*	*2.52*
297077	*V2-028 E*	*0.2*
904212	*V4-022 E*	*0.21*
232813	*VAUGHN*	*0.14*
901004	*W1-003 E*	*0.3*
901014	*W1-004 E*	*0.3*
901024	*W1-005 E*	*0.3*
901034	*W1-006 E*	*0.3*
901411	*W1-062*	*1.46*
907052	*X1-032 E*	*0.26*
907324	*X1-096 E*	*5.96*
913412	*Y1-080 E*	*0.11*
915542	*Y3-058 E*	*0.6*
920582	*Z1-076 C*	*0.36*
920583	*Z1-076 E*	*0.58*
920592	*Z1-077 C*	*0.25*
920593	*Z1-077 E*	*0.41*
917082	*Z2-012 E*	*0.82*
920763	*Z2-076 E*	*0.15*
920773	*Z2-077 E*	*0.15*
921122	*AA1-059 C*	*0.28*
921123	*AA1-059 E*	*0.11*
921592	*AA1-140 C*	*0.58*
921593	*AA1-140 E*	*0.95*
921602	*AA1-141 C*	*0.38*
921603	*AA1-141 E*	*0.62*
921872	*AA2-069*	*41.16*
922213	*AA2-129 E*	*1.33*
922222	*AA2-130*	*0.13*
922752	*AB1-056 C OP*	*4.98*
922753	*AB1-056 E OP*	*14.19*
922762	*AB1-057 C*	*5.06*
922763	*AB1-057 E*	*14.42*
923282	*AB1-137 C*	*0.33*
923283	*AB1-137 E*	*0.14*
923902	*AB2-030 E*	*0.27*
923931	*AB2-033 C*	*0.47*
923932	*AB2-033 E*	*0.19*
924361	*AB2-084 C*	*0.25*
924362	*AB2-084 E*	*0.4*
924681	*AB2-120 C OP*	*2.53*
924682	*AB2-120 E OP*	*4.12*
924781	*AB2-130 C OP*	*2.66*

924782	*AB2-130 E OP*	*4.34*
925091	*AB2-166 C*	*0.14*
925092	*AB2-166 E*	*0.24*
925101	*AB2-167 C*	*0.35*
925102	*AB2-167 E*	*0.58*
925231	*AB2-177 C*	*0.17*
925232	*AB2-177 E*	*0.28*
925261	*AB2-180 C*	*0.9*
925262	*AB2-180 E*	*0.38*
925381	*AC1-009 C*	*0.5*
925382	*AC1-009 E*	*0.82*
925651	*AC1-041 C*	*0.13*
925652	*AC1-041 E*	*0.21*
925731	*AC1-049 C*	*0.12*
925732	*AC1-049 E*	*0.19*
925741	*AC1-050 C*	*0.11*
925742	*AC1-050 E*	*0.18*
925761	*AC1-052 C*	*0.66*
925762	*AC1-052 E*	*0.27*
926131	*AC1-091 C*	*1.11*
926132	*AC1-091 E*	*1.82*
926141	*AC1-092 C*	*1.11*
926142	*AC1-092 E*	*1.82*
926151	*AC1-093 C*	*1.05*
926152	*AC1-093 E*	*1.73*
926161	*AC1-094 C*	*0.89*
926162	*AC1-094 E*	*1.46*
926171	*AC1-095 C*	*0.92*
926172	*AC1-095 E*	*0.69*
926911	*AC1-177*	*0.26*
927191	*AC1-213 C*	*0.23*
927192	*AC1-213 E*	*0.12*
927321	*AC1-229 C*	*0.3*
927322	*AC1-229 E*	*0.49*

Appendix 5

(DP&L - DP&L) The NMEREDTH-AB2-135 TAP 69 kV line (from bus 232812 to bus 924820 ckt 1) loads from 118.12% to 122.12% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 3.73 MW to the thermal violation.

CONTINGENCY 'DBL_4NC' /* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1

OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*1.64*
931162	*AC2-023 E*	*3.09*
932631	*AC2-185 C*	*2.24*
932632	*AC2-185 E*	*3.66*
932641	*AC2-186 C*	*0.71*
932642	*AC2-186 E*	*1.16*
932651	*AC2-187 C OP*	*0.99*
932652	*AC2-187 E OP*	*1.61*
932661	*AC2-188 C*	*1.42*
932662	*AC2-188 E*	*2.31*
932671	*AC2-189 C1 O*	*0.04*
932673	*AC2-189 C2 O*	*0.62*
932672	*AC2-189 E O*	*0.08*
932691	*AC2-191*	*1.52*
232900	*DEMECSMY*	*1.37*
232851	*DUP-SFR1*	*0.17*
232923	*MR1*	*1.32*
232924	*MR2*	*1.32*
232910	*NRG_G1*	*2.52*
232911	*NRG_G2*	*2.52*
297077	*V2-028 E*	*0.2*
904212	*V4-022 E*	*0.21*
232813	*VAUGHN*	*0.14*
901004	*W1-003 E*	*0.3*
901014	*W1-004 E*	*0.3*
901024	*W1-005 E*	*0.3*
901034	*W1-006 E*	*0.3*
901411	*W1-062*	*1.46*
907052	*X1-032 E*	*0.26*
907324	*X1-096 E*	*5.96*
913412	*Y1-080 E*	*0.11*
915542	*Y3-058 E*	*0.6*
920582	*Z1-076 C*	*0.36*
920583	*Z1-076 E*	*0.58*
920592	*Z1-077 C*	*0.25*
920593	*Z1-077 E*	*0.41*
917082	*Z2-012 E*	*0.82*
920763	*Z2-076 E*	*0.15*
920773	*Z2-077 E*	*0.15*
921122	*AA1-059 C*	*0.28*
921123	*AA1-059 E*	*0.11*
921592	*AA1-140 C*	*0.58*

921593	*AA1-140 E*	*0.95*
921602	*AA1-141 C*	*0.38*
921603	*AA1-141 E*	*0.62*
921872	*AA2-069*	*41.16*
922213	*AA2-129 E*	*1.33*
922222	*AA2-130*	*0.13*
922752	*AB1-056 C OP*	*4.98*
922753	*AB1-056 E OP*	*14.19*
922762	*AB1-057 C*	*5.06*
922763	*AB1-057 E*	*14.42*
923282	*AB1-137 C*	*0.33*
923283	*AB1-137 E*	*0.14*
923902	*AB2-030 E*	*0.27*
923931	*AB2-033 C*	*0.47*
923932	*AB2-033 E*	*0.19*
924361	*AB2-084 C*	*0.25*
924362	*AB2-084 E*	*0.4*
924681	*AB2-120 C OP*	*2.53*
924682	*AB2-120 E OP*	*4.12*
924781	*AB2-130 C OP*	*2.66*
924782	*AB2-130 E OP*	*4.34*
925091	*AB2-166 C*	*0.14*
925092	*AB2-166 E*	*0.24*
925101	*AB2-167 C*	*0.35*
925102	*AB2-167 E*	*0.58*
925231	*AB2-177 C*	*0.17*
925232	*AB2-177 E*	*0.28*
925261	*AB2-180 C*	*0.9*
925262	*AB2-180 E*	*0.38*
925381	*AC1-009 C*	*0.5*
925382	*AC1-009 E*	*0.82*
925651	*AC1-041 C*	*0.13*
925652	*AC1-041 E*	*0.21*
925731	*AC1-049 C*	*0.12*
925732	*AC1-049 E*	*0.19*
925741	*AC1-050 C*	*0.11*
925742	*AC1-050 E*	*0.18*
925761	*AC1-052 C*	*0.66*
925762	*AC1-052 E*	*0.27*
926131	*AC1-091 C*	*1.11*
926132	*AC1-091 E*	*1.82*
926141	*AC1-092 C*	*1.11*
926142	*AC1-092 E*	*1.82*
926151	*AC1-093 C*	*1.05*
926152	*AC1-093 E*	*1.73*

926161	*AC1-094 C*	*0.89*
926162	*AC1-094 E*	*1.46*
926171	*AC1-095 C*	*0.92*
926172	*AC1-095 E*	*0.69*
926911	*AC1-177*	*0.26*
927191	*AC1-213 C*	*0.23*
927192	*AC1-213 E*	*0.12*
927321	*AC1-229 C*	*0.3*
927322	*AC1-229 E*	*0.49*

Appendix 6

(DP&L - DP&L) The AB2-037 TAP-KEEN_230 230 kV line (from bus 923960 to bus 231003 ckt 2) loads from 101.38% to 101.92% (DC power flow) of its emergency rating (727 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 8.7 MW to the thermal violation.

CONTINGENCY 'DBL_4NC' /* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*12.*
931162	*AC2-023 E*	*22.65*
932631	*AC2-185 C*	*6.72*
932632	*AC2-185 E*	*10.96*
932641	*AC2-186 C*	*1.65*
932642	*AC2-186 E*	*2.7*
932651	*AC2-187 C OP*	*3.38*
932652	*AC2-187 E OP*	*5.52*
932661	*AC2-188 C*	*3.31*
932662	*AC2-188 E*	*5.39*
932671	*AC2-189 C1 O*	*0.32*
932673	*AC2-189 C2 O*	*4.37*
932672	*AC2-189 E O*	*0.59*
932691	*AC2-191*	*8.7*
232926	*CRISFLD1*	*0.74*
232923	*MR1*	*7.73*
232924	*MR2*	*7.73*
232912	*OH NUG1*	*3.35*
232913	*OH NUG2*	*3.3*
232914	*OH NUG3*	*3.35*
232915	*OH NUG4*	*3.35*
232916	*OH NUG5*	*3.35*

232917	*OH NUG6*	*3.33*
232918	*OH NUG7*	*3.32*
232921	*TASLEY2G*	*2.29*
297077	*V2-028 E*	*1.68*
904212	*V4-022 E*	*1.41*
232907	*VN8*	*11.43*
901003	*W1-003 C*	*0.21*
901004	*W1-003 E*	*2.07*
901013	*W1-004 C*	*0.21*
901014	*W1-004 E*	*2.07*
901023	*W1-005 C*	*0.21*
901024	*W1-005 E*	*2.07*
901033	*W1-006 C*	*< 0.01*
901034	*W1-006 E*	*2.07*
907052	*X1-032 E*	*1.82*
907323	*X1-096 C*	*1.45*
907324	*X1-096 E*	*42.34*
910572	*X3-008 E*	*5.51*
910592	*X3-015 E*	*5.42*
910822	*X3-066 E*	*1.31*
913362	*Y1-079 E*	*2.4*
913412	*Y1-080 E*	*0.94*
915542	*Y3-058 E*	*4.22*
920582	*Z1-076 C*	*2.42*
920583	*Z1-076 E*	*3.95*
920592	*Z1-077 C*	*1.73*
920593	*Z1-077 E*	*2.82*
916441	*Z1-100*	*0.31*
916451	*Z1-101*	*0.31*
916461	*Z1-102*	*0.31*
920602	*Z1-103*	*0.31*
917082	*Z2-012 E*	*5.64*
920763	*Z2-076 E*	*0.91*
920773	*Z2-077 E*	*0.91*
920812	*Z2-097 C*	*1.11*
920813	*Z2-097 E*	*0.46*
920952	*AA1-025*	*0.28*
920962	*AA1-026*	*0.28*
920972	*AA1-027*	*0.28*
920982	*AA1-028*	*0.28*
921122	*AA1-059 C*	*1.96*
921123	*AA1-059 E*	*0.77*
921142	*AA1-061 C*	*5.96*
921143	*AA1-061 E*	*2.94*
918831	*AA1-102*	*2.79*

921442	*AA1-110 C*	*1.25*
921443	*AA1-110 E*	*0.63*
921592	*AA1-140 C*	*3.45*
921593	*AA1-140 E*	*5.63*
921602	*AA1-141 C*	*2.59*
921603	*AA1-141 E*	*4.23*
921872	*AA2-069*	*240.92*
922213	*AA2-129 E*	*9.1*
922222	*AA2-130*	*0.91*
922752	*AB1-056 C OP*	*29.24*
922753	*AB1-056 E OP*	*83.27*
922762	*AB1-057 C*	*29.69*
922763	*AB1-057 E*	*84.63*
923282	*AB1-137 C*	*1.91*
923283	*AB1-137 E*	*0.82*
923322	*AB1-141 C OP*	*4.63*
923323	*AB1-141 E OP*	*2.16*
923332	*AB1-142 C OP*	*4.63*
923333	*AB1-142 E OP*	*2.16*
923452	*AB1-162 C OP*	*2.23*
923453	*AB1-162 E OP*	*3.64*
923602	*AB1-176 C*	*1.19*
923603	*AB1-176 E*	*1.97*
923902	*AB2-030 E*	*1.82*
923921	*AB2-032 C*	*4.66*
923922	*AB2-032 E*	*2.19*
923931	*AB2-033 C*	*3.26*
923932	*AB2-033 E*	*1.29*
923951	*AB2-036 C*	*15.26*
923952	*AB2-036 E*	*24.95*
923961	*AB2-037 C*	*42.83*
923962	*AB2-037 E*	*69.96*
924191	*AB2-063 C*	*2.67*
924192	*AB2-063 E*	*4.35*
924361	*AB2-084 C*	*1.73*
924362	*AB2-084 E*	*2.82*
924681	*AB2-120 C OP*	*17.29*
924682	*AB2-120 E OP*	*28.21*
924781	*AB2-130 C OP*	*14.58*
924782	*AB2-130 E OP*	*23.78*
924801	*AB2-133 C OP*	*7.71*
924802	*AB2-133 E OP*	*9.78*
924821	*AB2-135 C*	*10.07*
924822	*AB2-135 E*	*11.48*
924831	*AB2-136 C OP*	*11.11*

924832	*AB2-136 E OP*	*11.78*
924881	*AB2-142 C*	*2.24*
924882	*AB2-142 E*	*3.65*
924971	*AB2-153 C*	*2.61*
924972	*AB2-153 E*	*4.25*
925091	*AB2-166 C*	*0.91*
925092	*AB2-166 E*	*1.59*
925101	*AB2-167 C*	*2.41*
925102	*AB2-167 E*	*3.96*
925151	*AB2-172 C OP*	*8.44*
925152	*AB2-172 E OP*	*13.76*
925231	*AB2-177 C*	*1.14*
925232	*AB2-177 E*	*1.86*
925261	*AB2-180 C*	*6.35*
925262	*AB2-180 E*	*2.72*
925271	*AB2-185 C OP*	*5.42*
925272	*AB2-185 E OP*	*2.32*
925381	*AC1-009 C*	*3.46*
925382	*AC1-009 E*	*5.64*
925651	*AC1-041 C*	*0.86*
925652	*AC1-041 E*	*1.41*
925731	*AC1-049 C*	*0.68*
925732	*AC1-049 E*	*1.13*
925741	*AC1-050 C*	*0.86*
925742	*AC1-050 E*	*1.4*
925761	*AC1-052 C*	*4.55*
925762	*AC1-052 E*	*1.82*
926131	*AC1-091 C*	*3.32*
926132	*AC1-091 E*	*5.44*
926141	*AC1-092 C*	*3.32*
926142	*AC1-092 E*	*5.44*
926151	*AC1-093 C*	*3.14*
926152	*AC1-093 E*	*5.17*
926161	*AC1-094 C*	*2.65*
926162	*AC1-094 E*	*4.38*
926171	*AC1-095 C*	*2.74*
926172	*AC1-095 E*	*2.08*
926721	*AC1-154 C*	*0.4*
926722	*AC1-154 E*	*0.67*
926911	*AC1-177*	*1.82*
927031	*AC1-190 C*	*15.56*
927032	*AC1-190 E*	*6.67*
927191	*AC1-213 C*	*1.59*
927192	*AC1-213 E*	*0.82*
927241	*AC1-220 C OP*	*5.44*

927242	*AC1-220 E OP*	*3.86*
927272	*AC1-224 E*	*0.77*
927311	*AC1-228 C*	*0.49*
927312	*AC1-228 E*	*0.84*
927321	*AC1-229 C*	*1.72*
927322	*AC1-229 E*	*2.81*

Appendix 7

(DP&L - DP&L) The AB2-135 TAP-CHURC_69 69 kV line (from bus 924820 to bus 232203 ckt 1) loads from 168.71% to 172.71% (DC power flow) of its emergency rating (93 MVA) for the tower line contingency outage of 'DBL_4NC'. This project contributes approximately 3.73 MW to the thermal violation.

CONTINGENCY 'DBL_4NC' /* RED LION-CEDAR CREEK 230;RED LION-CARTANZA 230
OPEN LINE FROM BUS 231004 TO BUS 232002 CKT 1
OPEN LINE FROM BUS 231004 TO BUS 232003 CKT 1
END

Bus Number	*Bus Name*	*Full Contribution*
931161	*AC2-023 C*	*1.64*
931162	*AC2-023 E*	*3.09*
932631	*AC2-185 C*	*2.24*
932632	*AC2-185 E*	*3.66*
932641	*AC2-186 C*	*0.71*
932642	*AC2-186 E*	*1.16*
932651	*AC2-187 C OP*	*0.99*
932652	*AC2-187 E OP*	*1.61*
932661	*AC2-188 C*	*1.42*
932662	*AC2-188 E*	*2.31*
932671	*AC2-189 C1 O*	*0.04*
932673	*AC2-189 C2 O*	*0.62*
932672	*AC2-189 E O*	*0.08*
932691	*AC2-191*	*1.52*
232900	*DEMECSMY*	*1.37*
232851	*DUP-SFR1*	*0.17*
232923	*MR1*	*1.32*
232924	*MR2*	*1.32*
232910	*NRG_G1*	*2.52*
232911	*NRG_G2*	*2.52*
904212	*V4-022 E*	*0.21*
232813	*VAUGHN*	*0.14*
901004	*W1-003 E*	*0.3*
901014	*W1-004 E*	*0.3*
901024	*W1-005 E*	*0.3*

901034	*W1-006 E*	*0.3*
901411	*W1-062*	*1.46*
907052	*X1-032 E*	*0.26*
907324	*X1-096 E*	*5.96*
915542	*Y3-058 E*	*0.6*
920582	*Z1-076 C*	*0.36*
920583	*Z1-076 E*	*0.58*
920592	*Z1-077 C*	*0.25*
920593	*Z1-077 E*	*0.41*
917082	*Z2-012 E*	*0.82*
920763	*Z2-076 E*	*0.15*
920773	*Z2-077 E*	*0.15*
921122	*AA1-059 C*	*0.28*
921123	*AA1-059 E*	*0.11*
921592	*AA1-140 C*	*0.58*
921593	*AA1-140 E*	*0.95*
921602	*AA1-141 C*	*0.38*
921603	*AA1-141 E*	*0.62*
921872	*AA2-069*	*41.16*
922213	*AA2-129 E*	*1.33*
922222	*AA2-130*	*0.13*
922752	*AB1-056 C OP*	*4.98*
922753	*AB1-056 E OP*	*14.19*
922762	*AB1-057 C*	*5.06*
922763	*AB1-057 E*	*14.42*
923282	*AB1-137 C*	*0.33*
923283	*AB1-137 E*	*0.14*
923902	*AB2-030 E*	*0.27*
923931	*AB2-033 C*	*0.47*
923932	*AB2-033 E*	*0.19*
924361	*AB2-084 C*	*0.25*
924362	*AB2-084 E*	*0.4*
924681	*AB2-120 C OP*	*2.53*
924682	*AB2-120 E OP*	*4.12*
924781	*AB2-130 C OP*	*2.66*
924782	*AB2-130 E OP*	*4.34*
924821	*AB2-135 C*	*22.27*
924822	*AB2-135 E*	*25.39*
925091	*AB2-166 C*	*0.14*
925092	*AB2-166 E*	*0.24*
925101	*AB2-167 C*	*0.35*
925102	*AB2-167 E*	*0.58*
925231	*AB2-177 C*	*0.17*
925232	*AB2-177 E*	*0.28*
925261	*AB2-180 C*	*0.9*

925262	*AB2-180 E*	*0.38*
925381	*AC1-009 C*	*0.5*
925382	*AC1-009 E*	*0.82*
925651	*AC1-041 C*	*0.13*
925652	*AC1-041 E*	*0.21*
925731	*AC1-049 C*	*0.12*
925732	*AC1-049 E*	*0.19*
925761	*AC1-052 C*	*0.66*
925762	*AC1-052 E*	*0.27*
926131	*AC1-091 C*	*1.11*
926132	*AC1-091 E*	*1.82*
926141	*AC1-092 C*	*1.11*
926142	*AC1-092 E*	*1.82*
926151	*AC1-093 C*	*1.05*
926152	*AC1-093 E*	*1.73*
926161	*AC1-094 C*	*0.89*
926162	*AC1-094 E*	*1.46*
926171	*AC1-095 C*	*0.92*
926172	*AC1-095 E*	*0.69*
926911	*AC1-177*	*0.26*
927191	*AC1-213 C*	*0.23*
927192	*AC1-213 E*	*0.12*
927321	*AC1-229 C*	*0.3*
927322	*AC1-229 E*	*0.49*