



Limited Operation Impact Study For Generator Interconnection

GEN-2015-096

September 2016
Generator Interconnection



Revision History

Date	Author	Change Description
09/14/2016	SPP	Limited Operation Impact Study (LOIS) for Generator Interconnection Request GEN-2015-096 Report Revision 0 Issued

Executive Summary

<OMITTED TEXT> (Interconnection Customer) has requested a Limited Operation System Impact Study under the Southwest Power Pool Open Access Transmission Tariff (OATT) for 150 MW of wind generation to be interconnected with Energy Resource Interconnection Service (ERIS) into the integrated transmission system of Basin Electric Power Cooperative (BEPC)/ Western Area Power Administration (WAPA) in Hettinger and Stark Counties, North Dakota. GEN-2015-096 under GIA Section 5.9, has requested this Limited Operation Interconnection Study (LOIS) to determine the impacts of interconnecting to the transmission system before all required Network Upgrades identified in the DISIS-2015-002 (or most recent iteration) Impact Study can be placed into service. Additionally, Interconnection Customer has requested this LOIS analysis be conducted without accounting for the GEN-2015-091 generation.

This LOIS addresses the effects of interconnecting the generator to the rest of the transmission system for the system topology and conditions as expected on December 31, 2017. GEN-2015-096 is requesting the interconnection of seventy-five (75) GE 2.0MW wind turbines and associated facilities interconnecting at the planned Daglum 230kV substation which is tapping and tying into the Basin Electric Power Cooperative (BPEC) owned Belfield – Rhame 230kV transmission line in Stark County, North Dakota. For this LOIS, power flow and stability analysis was conducted. The LOIS assumes that only the higher queued projects listed within Table 1 of this study might go into service before the completion of all Network Upgrades identified within Table 2 of this report. If additional generation projects, listed within Table 3, with queue priority equal to or higher than the study project request rights to go into commercial operation before all Network Upgrades identified within Table 2 of this report are completed, this LOIS may need to be restudied to ensure that interconnection service remains for the customer’s request.

Power flow and stability analysis from this LOIS has determined that the GEN-2015-096 request can interconnect 150 MW of generation with Energy Resource Interconnection Service (ERIS) on 12/31/2017 prior to the completion of the required Network Upgrades, listed within

Table 2

Table 2 of this report, provided the Dickinson 230/115kV transformer is placed in service subsequent to that date. If the Dickinson 230/115/13kV transformer circuit #2 is not in-service by 1/2020, then GEN-2015-096 could be limited to a reduced amount of 105 MW with the Table 1 assumptions. If the Dickinson 230/115/13kV transformer circuit #2 is not in-service by 1/2025, then GEN-2015-096 could be limited to 0 MW with the Table 1 assumptions. Should any other projects, other than those listed within Table 1 of this report, come into service an additional study may be required to determine if any limited operation service is available. It should be noted that although this LOIS analyzed many of the most probable contingencies, it is not an all-inclusive list that can account for every operational situation. Additionally, the generator may not be able to inject any power onto the Transmission System due to constraints that fall below the threshold of mitigation for a Generator Interconnection request. Because of this, it is likely that the Customers may be required to reduce their generation output to **0 MW** under certain system conditions to allow system operators to maintain the reliability of the transmission network.

The power flow analysis for this LOIS observed constraints on Affected Systems and the Limited Operation amounts provided within this LOIS report are subject to Affected System Limited Operation Impact Study analysis and results. Should the Interconnection Customer elect to continue with LOIS, the Interconnection Customer will need to coordinate with the Affected System Parties for Affected System Limited Operation Impact Study or an equivalent study. Affected System constraints with 3% distribution impact factor are in the Appendix A (Affected System Thermal Constraints) and Appendix B (Affected System Voltage Constraints). Any additional Affected System constraints observed in the DISIS-2015-002 or latest restudy could be evaluated by the Affected System party for the Affected System Limited Operation Impact Study.

Transient stability analysis for this LOIS has determined that, without the previously assigned Daglum-Dickinson 230kV line in service, GEN-2015-096 request will be limited to a maximum of 112.5MW output for the prior outage of Daglum-Belfield 230kV line. No other transient stability issues were observed for the transmission system for the fifty-one (51) selected faults for the limited operation interconnection of GEN-2015-096 and the analysis shows that the generator will meet Low Voltage Ride-Through (LVRT) requirements of FERC Order #661A. As discussed above, this amount may be reduced further dependent upon system conditions at the time of the outage.

Nothing in this study should be construed as a guarantee of delivery or transmission service. If the customer wishes to sell power from the facility, a separate request for transmission service must be requested on Southwest Power Pool's OASIS by the Customer.

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Purpose

<OMITTED TEXT> (Interconnection Customer) has requested a Limited Operation System Impact Study (LOIS) under the Southwest Power Pool (SPP) Open Access Transmission Tariff (OATT) for interconnection requests into the integrated transmission system of Basin Electric Power Cooperative (BEPC)/Western Area Power Administration (WAPA).

The purpose of this study is to reevaluate the impacts of interconnecting GEN-2015-096 request with a total of 150 MW comprised of seventy-five (75) GE 2.0MW wind turbines and associated facilities interconnecting at the Daglum 230kV substation which is tapping and tying into the Basin Electric Power Cooperative (BPEC) owned Belfield – Rhame 230kV transmission line in Stark County, North Dakota. The Interconnection Customer has requested this amount to be studied with Energy Resource Interconnection Service (ERIS) to commence on or around December 2017. Additionally, Interconnection Customer has requested this LOIS analysis be conducted without accounting for the GEN-2015-091 generation.

Both power flow and transient stability analysis were conducted for this Limited Operation Interconnection Service. Limited Operation Studies are conducted under GIA Section 5.9.

The LOIS considers the Base Case as well as all Generating Facilities (and with respect to (b) below, any identified Network Upgrades associated with such higher queued interconnection) that, on the date the LOIS is commenced:

- a) are directly interconnected to the Transmission System;
- b) are interconnected to Affected Systems and may have an impact on the Interconnection Request;
- c) have a pending higher queued Interconnection Request to interconnect to the Transmission System listed in Table 1; or
- d) have no Queue Position but have executed an LGIA or requested that an unexecuted LGIA be filed with FERC.

Any changes to these assumptions, for example, one or more of the previously queued requests not included within this study execute an interconnection agreement and commencing commercial operation, may require a re-study of this LOIS at the expense of the Customer.

Nothing within this System Impact Study constitutes a request for transmission service or confers upon the Interconnection Customer any right to receive transmission service rights. Should the Customer require transmission service, those rights should be requested through SPP's Open Access Same-Time Information System (OASIS).

This LOIS study included prior queued generation interconnection requests. Those listed within Table 1 are the generation interconnection requests that are assumed to have rights to either full or partial interconnection service prior to the requested December 2017 in-service for this LOIS. Also listed in Table 1 are both the amount of MWs of interconnection service expected at the

effective time of this study and the total MWs requested of interconnection service, the fuel type, the point of interconnection (POI), and the current status of each particular prior queued request.

Table 1: Generation Requests Included within LOIS

Project	MW	Total MW	Fuel Source	POI	Status
G380	149.2	149.2	Wind	Rugby 115kV	IA Fully Executed/Commercial Operation
G408	11.88	11.88	Wind	Tap McHenry-Souris 115kV	IA Fully Executed/Commercial Operation
G502	50.6	50.6	Wind	Milton S Young Station 230kV	IA Fully Executed/Commercial Operation
G645	50	50	Coal	Ladish 115kV	IA Fully Executed/Commercial Operation
G723	7	7	Diesel	Heskett 115kV	IA Fully Executed/Commercial Operation
G752	150	150	Wind	Tap Bison-Hettinger 230kV	IA Fully Executed/Commercial Operation
G788	102.6	102.6	Coal	Ladish 115kV	IA Fully Executed/Commercial Operation
G830	99	99	Wind	GRE McHenry 115kV	IA Fully Executed/On Schedule for 2017
J003	19.5	19.5	Wind	Baker 115kV	IA Fully Executed/Commercial Operation
J249	180	180	Wind	MDU Tatanka 230kV	IA Fully Executed/Commercial Operation
J262	100	100	Wind	Jamestown 345kV	IA Fully Executed/On Schedule
J263	100	100	Wind	Jamestown 345kV	IA Fully Executed/On Schedule
J290	150	150	Wind	Rugby to Glenboro 230kV	IA Fully Executed/Commercial Operation
J316	150	150	Wind	Tap Tatanka-Ellendale 230kV	IA Pending
MPC01200	98.9	98.9	Wind	Maple River 230kV	IA Fully Executed/Commercial Operation for 54.9MW. IA Pending for remaining 44MW
MPC02100	99.3	99.3	Wind	Center – Mandan 230kV	On schedule for 2016
GEN-2005-008IS (GI-0508)	49.5	49.5	Wind	Hilken 230kV [Ecklund 230kV]	IA Fully Executed/Commercial Operation
GEN-2006-015IS (GI-0615)	49.5	49.5	Wind	Hilken 230kV [Ecklund 230kV]	IA Fully Executed/Commercial Operation
GEN-2007-015IS (GI-0715)	100	100	Wind	Hilken 230kV	IA Fully Executed/Commercial Operation
GEN-2007-027IS (GI-0727)	99	99	Wind	Bismarck-Garrison 230kV #1	IA Fully Executed/On Suspension
GEN-2009-026IS (GI-0926)	106.5	106.5	Wind	Dickinson-Heskett 230kV	IA Fully Executed/On Schedule
GEN-2010-007IS (GI-1007)	172.5	172.5	Wind	Antelope 345kV	IA Fully Executed/On Suspension
GEN-2012-006IS (GI-1206)	141	141	Gas	Williston-Charlie Creek 230kV	IA Fully Executed/On Schedule
GEN-2014-004IS (GI-1404)	384.2	384.2	Wind	Charlie Creek 345kV	IA Fully Executed/IA Pending
GEN-2014-006IS (GI-1406)	113.28	113.28	Gas	Williston 115kV	IA Fully Executed/On Schedule for 2016

Table 1: Generation Requests Included within LOIS

Project	MW	Total MW	Fuel Source	POI	Status
GEN-2014-010IS (GI-1410)	150	150	Wind	Neset 115kV	IA Fully Executed/On Schedule for 2016
GEN-2014-014IS (GI-1414)	149.73	149.73	Wind	Belfield-Rhame 230kV	IA Fully Executed/On Schedule for 2016
GEN-2015-046	300	300	Wind	Tande 345kV	Interconnection Facility Study in progress
GEN-2015-098	100	100	Wind	Mingusville 230kV	Interconnection Facility Study in progress
GEN-2015-096	150	150	Wind	Tap Belfield-Rhame 230kV	Interconnection Facility Study in progress

This LOIS was required because the Interconnection Customer is requesting interconnection prior to the completion of all of their required upgrades listed within the latest iteration of their Definitive Interconnection System Impact Study (DISIS).

Table 2 below lists the required upgrade projects for which these requests have cost responsibility. GEN-2015-096 was included within the DISIS-2015-002 that was studied in fall 2015 and posted April 29, 2016. The cluster has been restudied since the original posting. These reports can be located at the following Generation Interconnection Study URL:

http://sppoasis.spp.org/documents/swpp/transmission/GenStudies.cfm?YearType=2015_Impact_Studies

Table 2: Upgrade Projects not included but Required for Full Interconnection Service

Upgrade Project	Type	Description	Status	Study Assignment
Gentleman – Thedford – Holt County 345kV Circuit #1	New Line and transformers	Build approximately two hundred-seventeen (217) miles of new 345kV transmission line and install Thedford 345/115/13kV transformer	On Schedule by 1/2019	2012 ITP 10
Kummer Ridge – Roundup 345kV Circuit #1	New Line	Build approximately thirty-two (32) miles of new 345kV transmission line	NTC - Commitment Window	SPP 2016 ITPNT
Daglum – Dickinson 230kV Circuit #1	New Line	Build new approximately twenty-eight (28) miles of new 230kV circuit	Pending Facilities Study	DISIS-2015-002
Dickinson 230/115/13.8kV Transformer Circuit #2	Build	Install second Dickinson 230/115/13.8kV Transformer	Pending Facilities Study	DISIS-2015-002
Hanlon 69kV Reactive Power Support	Install Capacitor Bank(s)	Install approximately 10Mvars of Capacitor Bank	Pending Facilities Study	DISIS-2015-002

Table 2: Upgrade Projects not included but Required for Full Interconnection Service

Upgrade Project	Type	Description	Status	Study Assignment
MISO/MPC Affected System Study and/or Network Upgrade(s)		MISO and MPC are currently performing their affected System Impact review study	Affected System Impact Study	

Any changes to these assumptions, for example, one or more of the previously queued requests not included within this study execute an interconnection agreement and commencing commercial operation, may require a re-study of this LOIS at the expense of the Interconnection Customer.

The higher or equally queued projects that were not included in this study are listed in Table 3. While this list is not all-inclusive, it is a list of the most probable and affecting prior-queued requests that were not included within this LOIS, either because no request for an LOIS has been made or the request is on suspension, etc.

Table 3: Higher or Equally Queued GI Requests not included within LOIS

Project	MW	Total MW	Fuel Source	POI	Status
GEN-2015-091	101.2	101.2	Wind	Daglum 230kV	Interconnection Facility Study in progress

Nothing in this System Impact Study constitutes a request for transmission service or grants the Interconnection Customer any rights to transmission service.

Facilities

Generating Facility

The Interconnection Customer’s request to interconnect a total of 150 MW is comprised of seventy-five (75) GE 2.0MW wind turbines and associated facilities.

Interconnection Facilities

The POI for GEN-2015-096 Interconnection Customer is the Daglum 230kV substation in Stark County, North Dakota. *Figure 1* depicts the one-line diagram of the local transmission system including the POI as well as the power flow model representing the requests.

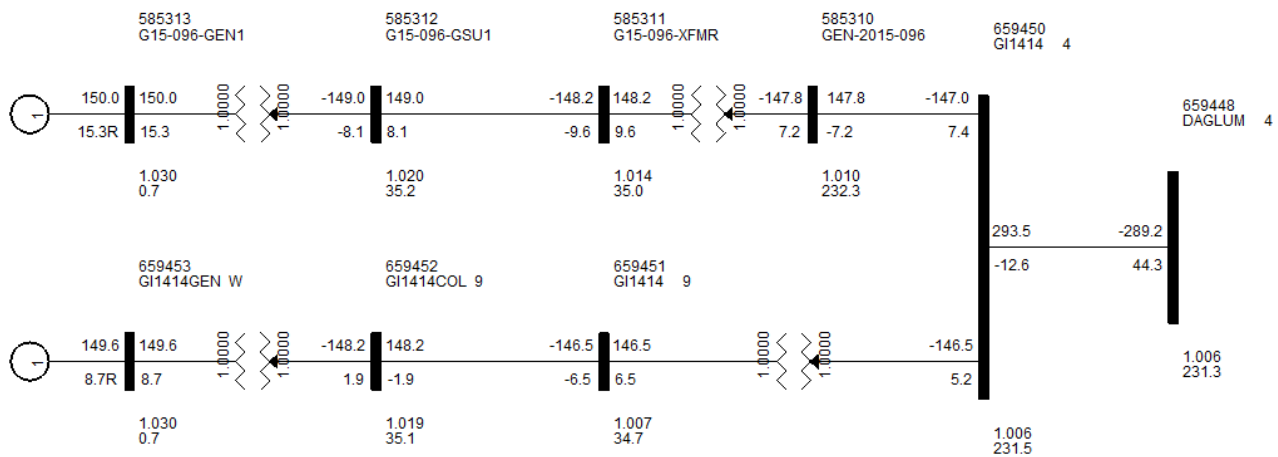


Figure 1: Proposed POI Configuration and Request Power Flow Model

Base Case Network Upgrades

The Network Upgrades included within the cases used for this LOIS study are those facilities that are a part of the SPP Transmission Expansion Plan, Balanced Portfolio, or Integrated System (IS) Integration Study projects that have in-service dates prior to the GEN-2015-096 requested in-service date of December 31, 2017. These facilities have an approved Notification to Construct (NTC), or are in construction stages and expected to be in-service at the effective time of this study. No other upgrades were included for this LOIS. If for some reason, construction on these projects is delayed or discontinued, a restudy may be needed to determine the interconnection service availability of the Customer.

Power Flow Analysis

Power flow analysis is used to determine if the transmission system can accommodate the injection from the request without violating thermal or voltage transmission planning criteria.

Model Preparation

Power flow analysis was performed using modified versions of the 2015 series of transmission service request study models including the 2016 Winter Peak (16WP), 2017 Spring (17G), and 2017 Summer Peak (17SP), 2020 Light (20L), and 2020 Summer (SP) and Winter (WP) peak seasonal models. To incorporate the Interconnection Customers' request, a re-dispatch of existing generation within SPP was performed with respect to the amount of the Customers' injection.

For Variable Energy Resources (VER) (solar/wind) in each power flow case, Energy Resource Interconnection Service (ERIS), is evaluated for the generating plants within a geographical area of the interconnection request(s) for the VERs dispatched at 100% nameplate of maximum generation. The VERs in the remote areas is dispatched at 20% nameplate of maximum generation. These projects are dispatched across the SPP footprint using load factor ratios.

Peaking units are not dispatched in the 2017 spring and 2020 light, or in the "High VER" summer and winter peaks. To study peaking units' impacts, the 2016 winter peak, 2017 summer peak, and 2020 summer and winter peaks, models are developed with peaking units dispatched at 100% of the nameplate rating and VERs dispatched at 20% of the nameplate rating. Each interconnection request is also modeled separately at 100% nameplate for certain analyses.

All generators (VER and peaking) that requested Network Resource Interconnection Service (NRIS) are dispatched in an additional analysis into the interconnecting Transmission Owner's (T.O.) area at 100% nameplate with Energy Resource Interconnection Service (ERIS) only requests at 80% nameplate. This method allows for identification of network constraints that are common between regional groupings to have affecting requests share the mitigating upgrade costs throughout the cluster.

For this LOIS, only the previous queued requests listed in Table 1 were assumed to be in-service at 100% dispatch.

Study Methodology and Criteria

Network constraints are found by using PSS/E AC Contingency Calculation (ACCC) analysis with PSS/E MUST First Contingency Incremental Transfer Capability (FCITC) analysis on the entire cluster grouping dispatched at the various levels previously mentioned.

For Energy Resource Interconnection Service (ERIS), thermal overloads are determined for system intact (n-0) (greater than 100% of Rate A - normal) and for contingency (n-1) (greater than 100% of Rate B – emergency) conditions.

The overloads are then screened to determine which of generator interconnection requests have at least

- 3% Distribution Factor (DF) for system intact conditions (n-0),
- 20% DF upon outage based conditions (n-1),
- or 3% DF on contingent elements that resulted in a non-converged solution.

Interconnection Requests that requested Network Resource Interconnection Service (NRIS) are also studied in a separate NRIS analysis to determine if any constraint measured greater than or equal to a 3% DF. If so, these constraints are also considered for transmission reinforcement under NRIS.

The contingency set includes all SPP control area branches and ties 69kV and above, first tier Non-SPP control area branches and ties 115 kV and above, any defined contingencies for these control areas, and generation unit outages for the SPP control areas with SPP reserve share program redispatch.

The monitor elements include all SPP control area branches, ties, and buses 69 kV and above, and all first tier Non-SPP control area branches and ties 69 kV and above. NERC Power Transfer Distribution Flowgates for SPP and first tier Non-SPP control area are monitored. Additional NERC Flowgates are monitored in second tier or greater Non-SPP control areas. Voltage monitoring was performed for SPP control area buses 69 kV and above.

Results

The LOIS ACCC analysis indicates that the Interconnection Customer can interconnect its generation into the BEPC/WAPA transmission system at a reduced rate before all required upgrades listed within the DISIS-2015-002 study or latest iteration can be placed into service. Should any other GI projects, other than those listed within Table 1 of this report, come into service, an additional study may be required to determine if any limited operation service is available.

ACCC results for the LOIS can be found in Table 4 through 7 below. Table 4 power flow analysis results assume system conditions as of December 31, 2017 without GEN-2015-091 generation. Under this assumption GEN-2015-096 could interconnect up to 150MW of Interconnection Service. Table 5 analysis results assume system conditions as of December 31, 2017 without GEN-2015-091 generation and if the installation and in-service of the Dickinson 230/115/13kV is after 1/2020, then GEN-2015-096 could be limited to 105MW of Limited Operation Interconnection Service. Table 6 analysis results assume system conditions as of December 31, 2017 without GEN-2015-091 generation and if the installation and in-service of the Dickinson 230/115/13kV is after 1/2025, then GEN-2015-096 could be limited to 0MW of Limited Operation Interconnection Service.

Table 7 **Error! Reference source not found.** has the overloads that are less than 20% TDF and are not for transmission reinforcement mitigation. Generator Interconnection Energy Resource Interconnection Service (ERIS) analysis doesn't mitigate with additional transmission reinforcement requirements for those issues in which the affecting GI request has less than a 20% OTDF, Table 7 is provided for informational purposes only so that the Interconnection Customer understands there

may be operational conditions when they may be required to reduce their output to maintain system reliability.

The power flow analysis for this LOIS observed constraints on Affected Systems and the Limited Operation amounts provided within this LOIS report are subject to Affected System Limited Operation Impact Study analysis and results. Should the Interconnection Customer elect to continue with LOIS, the Interconnection Customer will need to coordinate with the Affected System Parties for Affected System Limited Operation Impact Study or an equivalent study. Affected System constraints with 3% distribution impact factor are in the Appendix A (Affected System Thermal Constraints) and Appendix B (Affected System Voltage Constraints). Any additional Affected System constraints observed in the DISIS-2015-002 or latest restudy could be evaluated by the Affected System party for the Affected System Limited Operation Impact Study.

Curtailment and System Reliability

In no way does this study guarantee operation for all periods of time. It should be noted that although this study analyzed many of the most probable contingencies, it is not an all-inclusive list and cannot account for every operational situation. Because of this, it is likely that the Customer may be required to reduce their generation output to **0 MW** under certain system conditions to allow system operators to maintain the reliability of the transmission network.

Power Flow Analysis

Table 4: Interconnection Constraints for Transmission Reinforcement Mitigation of LOIS @ 150MW without GEN-2015-091

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Max MW Available	Contingency
				Currently no SPP Transmission Facilities observed in this LOIS.						

Table 5: Interconnection Constraints for Transmission Reinforcement Mitigation of LOIS @ 150MW without GEN-2015-091 and if Dickinson 230/115/13kV is not in-service by 1/2020

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Max MW Available	Contingency
20SP	16ALL	G15_096	'FROM->TO'	'DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1'	100	125	0.05717	101.4815	105	System Intact
20SP	16ALL	G15_096	'FROM->TO'	'DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1'	100	125	0.05717	100.3624	105	System Intact

Table 6: Interconnection Constraints for Transmission Reinforcement Mitigation of LOIS @ 150MW without GEN-2015-091 and if Dickinson 230/115/13kV is not in-service by 1/2025

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Max MW Available	Contingency
25SP	16ALL	G15_096	'FROM->TO'	'DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1'	100	125	0.05725	110.3767	0	System Intact
25SP	16ALL	G15_096	'FROM->TO'	'DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1'	100	125	0.05725	109.5503	0	System Intact

Table 7: Constraints not for Transmission Reinforcement Mitigation @ 150MW without GEN-2015-091

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
17SP	16ALL	G15_096	FROM->TO	BISMARCK - L3 HAWDON 230KV CKT 1	210	210	0.07066	99	FTTHOMPSON-LELANDOLDS-TLINE-REACTOR-CKT1
17SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.09294	100.872	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
17SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.11293	99.7	BOWMAN - RHAME 4 230.00 230KV CKT 1
17SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.09294	101.4231	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
17SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.11293	100.2991	BOWMAN - RHAME 4 230.00 230KV CKT 1
20SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.11117	103.5499	BOWMAN - RHAME 4 230.00 230KV CKT 1

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
20SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.11117	104.8404	BOWMAN - RHAME 4 230.00 230KV CKT 1
20SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.09187	107.1153	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
20SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.09187	105.9766	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
20WP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.09164	100.9852	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
20WP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.09164	101.2682	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
20WP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.05697	99.1	BASE CASE
25SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.09436	99.7	HEBRON 4 230.00 - MANDAN 4 230.00 230KV CKT 1
25SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.09436	100.3025	HEBRON 4 230.00 - MANDAN 4 230.00 230KV CKT 1
25SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.11124	113.3506	BOWMAN - RHAME 4 230.00 230KV CKT 1
25SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.11124	114.4852	BOWMAN - RHAME 4 230.00 230KV CKT 1
25SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.09194	115.8783	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
25SP	16ALL	G15_096	FROM->TO	DICKINSON (KW1A 100) 230/115/13.8KV TRANSFORMER CKT 1	100	125	0.09194	114.9631	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
20SP	16ALL	G15_096	FROM->TO	FARGO - SHEYNNE 230KV CKT 1	342	342	0.07851	109.7626	CENTER - JAMESTOWN 345KV CKT 1
20SP	16ALL	G15_096	FROM->TO	FARGO - SHEYNNE 230KV CKT 1	342	342	0.07837	130.7083	BUFFALO - JAMESTOWN 345KV CKT 1
25SP	16ALL	G15_096	FROM->TO	FARGO - SHEYNNE 230KV CKT 1	342	342	0.0784	113.863	CENTER - JAMESTOWN 345KV CKT 1
25SP	16ALL	G15_096	FROM->TO	FARGO - SHEYNNE 230KV CKT 1	342	342	0.06567	100.3624	BISON 3 345.00 - BUFFALO 345KV CKT 1
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - FT THOMPSON 230KV CKT 1	320	320	0.06028	99.8	GRANDPRAIRIE-FTTHOMPSON-TLINE-REACTORS-CKT1
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - FT THOMPSON 230KV CKT 1	320	320	0.06028	101.6698	GRANDPRAIRIE-HOLT-TLINE-REACTOR-CKT1
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - FT THOMPSON 230KV CKT 1	320	320	0.06028	99.8	FTTHOMPSON-GRANDPRAIRIE-TLINE-REACTOR-CKT1
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - FT THOMPSON 230KV CKT 1	320	320	0.06028	101.6698	GRPRAR1-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - FT THOMPSON 230KV CKT 1	320	320	0.06028	101.6746	GRPRAR1-LNX3345.00 - YANKTON 345KV CKT Z
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - FT THOMPSON 230KV CKT 1	320	320	0.06028	99.6	GRPRAR2-LNX3345.00 - YANKTON 345KV CKT Z
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - FT THOMPSON 230KV CKT 1	320	320	0.06028	101.3533	FTTHOM2-LNX3345.00 - GRPRAR2-LNX3345.00 345KV CKT 1
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - FT THOMPSON 230KV CKT 1	320	320	0.05954	106.0671	FT RANDAL - LAKE PLATT 230KV CKT 1
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - FT THOMPSON 230KV CKT 1	320	320	0.05954	107.9871	FT THOMPSON - LAKE PLATT 230KV CKT 1
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - FT THOMPSON 230KV CKT 1	320	320	0.05954	107.9871	FT THOMPSON - LAKE PLATT 230KV CKT 1
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - LAKE PLATT 230KV CKT 1	318.7	318.7	0.05882	104.0159	FT RANDAL - FT THOMPSON 230KV CKT 1
17SP	16ALL	G15_096	TO->FROM	FT RANDAL - LAKE PLATT 230KV CKT 1	318.7	318.7	0.05882	104.0159	FT RANDAL - FT THOMPSON 230KV CKT 1
17G	16ALL	G15_096	TO->FROM	G13_001IST 115.00 - SUMMIT 115KV CKT 1	120	121	0.02993	102.4838	G09_001IST 345.00 - WATERTOWN 345KV CKT 1

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
16WP	16ALL	G15_096	FROM->TO	G13_001IST 115.00 - WATERTOWN 115KV CKT 1	120	121	0.02981	100.647	G09_001IST 345.00 - WATERTOWN 345KV CKT 1
17G	16ALL	G15_096	FROM->TO	G13_001IST 115.00 - WATERTOWN 115KV CKT 1	120	121	0.02993	110.6833	G09_001IST 345.00 - GROTON 345KV CKT 1
17G	16ALL	G15_096	FROM->TO	G13_001IST 115.00 - WATERTOWN 115KV CKT 1	120	121	0.02993	115.5969	G09_001IST 345.00 - WATERTOWN 345KV CKT 1
17G	16ALL	G15_096	TO->FROM	GERALD GENTLEMAN STATION - OGALLALA 230KV CKT 1	320	320	0.043	102.3679	GERALD GENTLEMAN STATION - KEYSTONE 345KV CKT 1
17G	16ALL	G15_096	FROM->TO	GRANITE FALLS - MN VALLEY TAP 230KV CKT 1	240	259	0.05757	106.0613	GRANITE FALLS - MN VALLEY TAP 230KV CKT 1
17SP	16ALL	G15_096	FROM->TO	GRANITE FALLS - MN VALLEY TAP 230KV CKT 1	240	259	0.0578	115.9677	GRANITE FALLS - MN VALLEY TAP 230KV CKT 1
17SP	16ALL	G15_096	FROM->TO	GRANITE FALLS - MN VALLEY TAP 230KV CKT 1	240	259	0.0578	115.9677	GRANITE FALLS - MN VALLEY TAP 230KV CKT 1
16WP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04234	108.6865	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
16WP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04234	108.6682	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
16WP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04234	109.3395	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
17G	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04132	121.561	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
17G	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04132	122.2944	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
17G	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04132	121.5855	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
17SP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04616	118.045	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
17SP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04616	117.3897	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
17SP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04616	117.5672	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
20SP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04318	110.9761	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
20SP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04318	111.2219	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
20SP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04318	110.9668	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
20WP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.0403	100.9083	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
20WP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.0403	101.4121	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
20WP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.0403	100.9083	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
25SP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04337	112.6541	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
25SP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04337	112.0655	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
25SP	16ALL	G15_096	TO->FROM	OGALLALA - SIDNEY 230KV CKT 1	320	320	0.04337	112.0536	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
16WP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04843	103.6221	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
16WP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04843	102.9375	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
16WP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04843	102.9625	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
17G	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04725	115.5526	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
17G	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04725	114.8081	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
17G	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04725	114.8019	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
17SP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.05317	115.6606	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
17SP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.05317	116.325	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
17SP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.05317	115.8426	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
20SP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04971	109.6967	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
20SP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04971	109.6843	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
20SP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04971	110.0153	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
25SP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04994	110.9346	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
25SP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04994	111.5327	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
25SP	16ALL	G15_096	TO->FROM	SIDNEY - SIDNEY TRANSFORMER 230KV CKT 1	400	400	0.04994	110.9191	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
20SP	16ALL	G15_096	TO->FROM	SPLIT ROCK - WHITE 345KV CKT 1	717	717	0.12795	104.605	BROOKING COUNTY - LYON COUNTY 345KV CKT 1
25SP	16ALL	G15_096	TO->FROM	SPLIT ROCK - WHITE 345KV CKT 1	717	717	0.12875	104.0981	BROOKING COUNTY - LYON COUNTY 345KV CKT 1

Stability Analysis

Transient stability analysis is used to determine if the transmission system can maintain angular stability and ensure bus voltages stay within planning criteria bandwidth during and after a disturbance while considering the addition of a generator interconnection request.

Model Preparation

Transient stability analysis was performed using modified versions of the 2015 series of Model Development Working Group (MDWG) dynamic study models including the 2016 winter, 2017 and 2025 summer peak dynamic cases. The cases were adapted to resemble the power flow study cases with regards to prior queued generation requests and topology. Finally the prior queued and study generation was dispatched into the SPP footprint. Initial simulations are then carried out for a no-disturbance run of twenty (20) seconds to verify the numerical stability of the model.

Disturbances

The fifty-one (51) contingencies were identified for the Limited Operation scenario for use in this study. These faults are listed within Table 8. These contingencies included three-phase faults and single-phase line faults at locations defined by SPP. Single-phase line faults were simulated by applying fault impedance to the positive sequence network at the fault location to represent the effect of the negative and zero sequence networks on the positive sequence network. The fault impedance was computed to give a positive sequence voltage at the specified fault location of approximately 60% of pre-fault voltage. This method is in agreement with SPP current practice.

With exception to transformers, the typical sequence of events for a three-phase and single-phase fault is as follows:

1. apply fault at particular location
2. continue fault for five (5) cycles, clear the fault by tripping the faulted facility
3. after an additional twenty (20) cycles, re-close the previous facility back into the fault
4. continue fault for five (5) additional cycles
5. trip the faulted facility and remove the fault

Transformer faults are typically only performed for three-phase faults, unless otherwise noted. Additionally the sequence of events for a transformer is to 1) apply a three-phase fault for five (5) cycles and 2) clear the fault by tripping the affected transformer facility. Unless otherwise noted there will be no re-closing into a transformer fault.

Table 8: Contingencies Evaluated for Limited Operation

Contingency Number and Name		Description
1	FLT_01_TANDE3_JUDSON3_345kV_3PH	<p>3 phase fault on the Tande (659336) to Judson (659333) 345kV line, near Tande.</p> <p>a. Apply fault at the Tande 345kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
2	FLT_02_JUDSON3_PATENTGATE3_345kV_3PH	<p>3 phase fault on the Judson (659333) to Patentgate (659390) 345kV line, near Judson.</p> <p>a. Apply fault at the Judson 345kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
3	FLT_03_KUMMERRIDGE3_ROUNDUP3_345kV_3PH	<p>3 phase fault on the Kummer Ridge (659387) to Round Up (659384) 345kV line, near Kummer Ridge.</p> <p>a. Apply fault at the Kummer Ridge 345kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
4	FLT_04_CHARCK3_ROUNDUP3_345kV_3PH	<p>3 phase fault on the Charlie Creek (659183) to Round Up (659384) 345kV line, near Charlie Creek.</p> <p>a. Apply fault at the Charlie Creek 345kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
5	FLT_05_CHARCK3_ANTELOP3_345kV_3PH	<p>3 phase fault on the Charlie Creek (659183) to Antelope (659101) 345kV line, near Charlie Creek.</p> <p>a. Apply fault at the Charlie Creek 345kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
6	FLT_06_CHARCK3_BELFELD3_345kV_3PH	<p>3 phase fault on the Charlie Creek (659183) to Belfield (652424) 345kV line, near Charlie Creek.</p> <p>a. Apply fault at the Charlie Creek 345kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>

Contingency Number and Name		Description
7	FLT_07_DAGLUM4_BELFELD4_230kV_3PH	<p>3 phase fault on the Daglum (659448) to Belfield (652425) 230kV line, near Daglum.</p> <p>a. Apply fault at the Daglum 230kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
8	FLT_08_DAGLUM4_RHAME4_230kV_3PH	<p>3 phase fault on the Daglum (659448) to Rhame (659266) 230kV line, near Daglum.</p> <p>a. Apply fault at the Daglum 230kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
9	FLT_09_BELFELD4_DICKNSN4_230kV_3PH	<p>3 phase fault on the Belfield (652425) to Dickinson (652417) 230kV line, near Belfield.</p> <p>a. Apply fault at the Belfield 230kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
10	FLT_10_BELFELD4_MEDORA4_230kV_3PH	<p>3 phase fault on the Belfield (652425) to Medora (652413) 230kV line, near Belfield.</p> <p>a. Apply fault at the Belfield 230kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
11	FLT_11_BELFELD4_SHEART4_230kV_3PH	<p>3 phase fault on the Belfield (652425) to S Heart (659309) 230kV line, near Belfield.</p> <p>a. Apply fault at the Belfield 230kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
12	FLT_12_RHAME4_BOWMAN4_230kV_3PH	<p>3 phase fault on the Rhame (659266) to Bowman (661010) 230kV line, near Rhame.</p> <p>a. Apply fault at the Rhame 230kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>

Contingency Number and Name		Description
13	FLT_13_RHAME4_LTLMISS4_230kV_3PH	<p>3 phase fault on the Rhame (659266) to Little Missouri (659265) 230kV line, near Rhame.</p> <p>a. Apply fault at the Rhame 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
14	FLT_14_BAKER4_MICTYE4_230kV_3PH	<p>3 phase fault on the Baker (661004) to Miles City (652411) 230kV line, near Baker.</p> <p>a. Apply fault at the Baker 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
15	FLT_15_BOWMAN4_HETINGR4_230kV_3PH	<p>3 phase fault on the Bowman (661010) to Hettinger (661047) 230kV line, near Bowman.</p> <p>a. Apply fault at the Bowman 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
16	FLT_16_HEBRON4_MANDAN4_230kV_3PH	<p>3 phase fault on the Hebron (652468) to Mandan (661053) 230kV line, near Hebron.</p> <p>a. Apply fault at the Hebron 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
17	FLT_17_BEAVERHILL4_MEDORA4_230kV_3PH	<p>3 phase fault on the Beaver Hill (652616) to Medora (652413) 230kV line, near Beaver Hill.</p> <p>a. Apply fault at the Beaver Hill 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
18	FLT_18_BEAVERHILL4_DAWSONC4_230kV_3PH	<p>3 phase fault on the Beaver Hill (652616) to Dawson County (652403) 230kV line, near Beaver Hill.</p> <p>a. Apply fault at the Beaver Hill 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>

Contingency Number and Name		Description
19	FLT_19_DAWSONC4_MICTYE4_230kV_3PH	<p>3 phase fault on the Dawson County (652403) to Miles City (652411) 230kV line, near Dawson County.</p> <p>a. Apply fault at the Dawson County 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
20	FLT_20_DAWSONC4_COALHILL4_230kV_3PH	<p>3 phase fault on the Dawson County (652403) to Coal Hill (652111) 230kV line, near Dawson County.</p> <p>a. Apply fault at the Dawson County 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
21	FLT_21_COALHILL4_FTPECK4_230kV_3PH	<p>3 phase fault on the Coal Hill (652111) to Ft Peck (652405) 230kV line, near Coal Hill.</p> <p>a. Apply fault at the Coal Hill 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
22	FLT_22_DAWSONC4_LEWIS7_115kV_3PH	<p>3 phase fault on the Dawson County (652404) to Lewis (661056) 115kV line, near Dawson County.</p> <p>a. Apply fault at the Dawson County 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
23	FLT_23_DAWSONC4_FALLON7_115kV_3PH	<p>3 phase fault on the Dawson County (652404) to Fallon (652407) 115kV line, near Dawson County.</p> <p>a. Apply fault at the Dawson County 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
24	FLT_24_DAWSONC4_CIRCLE7_115kV_3PH	<p>3 phase fault on the Dawson County (652404) to Circle (652401) 115kV line, near Dawson County.</p> <p>a. Apply fault at the Dawson County 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>

Contingency Number and Name		Description
25	FLT_25_DAWSONC4_GLENDCT7_115kV_3PH	3 phase fault on the Dawson County (652404) to Glendive County (661032) 115kV line, near Dawson County. a. Apply fault at the Dawson County 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
26	FLT_26_TANDE3_TANDE4_345_230kV_3PH	3 phase fault on the Tande 345kV (659336) / 230kV (659337) / 13.8kV (659338) transformer, near Tande 345kV ckt 1. a. Apply fault at the Tande 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
27	FLT_27_PATENTGATE3_PATENTGATE7_345_115kV_3PH	3 phase fault on the Patentgate 345kV (659390) / 115kV (659391) / 13.8kV (659392) transformer, near Patentgate 345kV ckt 1. a. Apply fault at the Patentgate 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
28	FLT_28_JUDSON3_JUDSON4_345_230kV_3PH	3 phase fault on the Judson 345kV (659333) / 230kV (659334) / 13.8kV (659335) transformer, near Judson 345kV ckt 1. a. Apply fault at the Judson 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
29	FLT_29_CHARCK3_CHARCK4_345_230kV_3PH	3 phase fault on the Charlie Creek 345kV (659183) / 230kV (659302) / 13.8kV (659319) transformer, near Charlie Creek 345kV ckt 2. a. Apply fault at Charlie Creek 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
30	FLT_30_BELFELD3_BELFELD4_345_230kV_3PH	3 phase fault on the Belfield 345kV (652424) / 230kV (652425) / 13.8kV (652221) transformer, near Belfield 345kV ckt 1. a. Apply fault at the Belfield 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
31	FLT_31_RHAME4_RHAME7_230_115kV_3PH	3 phase fault on the Rhame 230kV (659266) / 115kV (659267) transformer, near Rhame 230kV ckt 1. a. Apply fault at the Rhame 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
32	FLT_32_BAKER4_BAKER7_230_115kV_3PH	3 phase fault on the Baker 230kV (661004) / 115kV (661005) / 13.8kV (661901) transformer, near Baker 230kV ckt 1. a. Apply fault at the Baker 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
33	FLT_33_BOWMAN4_BOWMAN7_230_115kV_3PH	3 phase fault on the Bowman 230kV (661010) / 115kV (659340) transformer, near Bowman 230kV ckt 1. a. Apply fault at the Bowman 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.

Contingency Number and Name		Description
34	FLT_34_DAWSONC4_DAWSONC7_230_115kV_3PH	<p>3 phase fault on the Dawson County 230kV (652403) / 115kV (652404) / 13.8kV (652211) transformer, near Dawson County 230kV ckt 1.</p> <p>a. Apply fault at the Dawson County 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.</p>
35	FLT_35_RHAME4PO_BOWMAN4PO_230kV_3PH	<p>Prior outage on the Belfield (652425) to Daglum (659448) 230kV line: 3 phase fault on the Rhame (659266) to Bowman (661010) 230kV line, near Rhame 230kV.</p> <p>a. Prior Outage Belfield to Daglum 230kV. b. Apply fault at the Rhame 230kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.</p>
36	FLT_36_PATENTGATE3PO_CHARCK3PO_345kV_3PH	<p>Prior outage on the Tande 345kV (659336) / 230kV (659337) / 13.8kV (659338) transformer ckt 1: 3 phase fault on the Patentgate (659390) to Charlie Creek (659183) 345kV line, near Patentgate 345kV.</p> <p>a. Prior Outage Tande 345/230/13.8kV transformer ckt1. b. Apply fault at the Patentgate 345kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.</p>
37	FLT_37_NESET4PO_TIOGA44PO_230kV_3PH	<p>Prior outage on the Tande (659336) to Judson (659333) 345kV line: 3 phase fault on the Neset (659138) to Tioga (661084) 230kV line, near Neset 230kV.</p> <p>a. Prior Outage Tande to Judson 345kV. b. Apply fault at the Neset 230kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.</p>
38	FLT_38_BELFELD4PO_MEDORA4PO_230kV_3PH	<p>Prior outage on the Belfield (652425) to Dickinson (652417) 230kV line: 3 phase fault on the Belfield (652425) to Medora (652413) 230kV line, near Belfield 230kV.</p> <p>a. Prior Outage Belfield to Dickinson 230kV. b. Apply fault at the Belfield 230kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.</p>

Contingency Number and Name		Description
39	FLT_39_BELFELD4PO_MEDORA4PO_230kV_3PH	<p>Prior outage on the Rhame (659266) to Daglum (659448) 230kV line: 3 phase fault on the Belfield (652425) to Medora (652413) 230kV line, near Belfield 230kV.</p> <ol style="list-style-type: none"> Prior Outage Rhame to Daglum 230kV. Apply fault at the Belfield 230kV bus. Clear fault after 5 cycles by tripping the faulted line. Wait 20 cycles, and then re-close the line in (c) back into the fault. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
40	FLT_40_DAWSONC4PO_COALHILL4PO_230kV_3PH	<p>Prior outage on the Dawson County (652403) to Miles City (652411) 230kV line: 3 phase fault on the Dawson County (652403) to Coal Hill (652111) 230kV line, near Dawson County 230kV.</p> <ol style="list-style-type: none"> Prior Outage Dawson County to Miles City 230kV. Apply fault at the Dawson County 230kV bus. Clear fault after 5 cycles by tripping the faulted line. Wait 20 cycles, and then re-close the line in (c) back into the fault. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
41	FLT_41_DAWSONC4PO_MICTYE4PO_230kV_3PH	<p>Prior outage on the Dawson County 230kV (652403) / 115kV (652404) / 13.8kV (652211) transformer ckt 1: 3 phase fault on the Dawson County (652403) to Miles City (652411) 230kV line, near Dawson County 230kV.</p> <ol style="list-style-type: none"> Prior Outage Dawson County 230/115/13.8kV transformer ckt1. Apply fault at the Dawson County 230kV bus. Clear fault after 5 cycles by tripping the faulted line. Wait 20 cycles, and then re-close the line in (c) back into the fault. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
42	FLT_42_JUDSON3PO_JUDSON4PO_345_230kV_3PH	<p>Prior outage on the Tande 345kV (659336) / 230kV (659337) / 13.8kV (659338) transformer ckt 1: 3 phase fault on the Judson 345kV (659333) / 230kV (659334) /13.8kV (659335) transformer ckt 1, near Judson 345kV.</p> <ol style="list-style-type: none"> Prior Outage Tande 345/230/13.8kV transformer ckt1. Apply fault at the Judson 345kV bus. Clear fault after 5 cycles by tripping the faulted transformer.
43	FLT_43_TANDE4SB_NESET4SB_230kV_1PH	<p>Single phase fault with stuck breaker on the Tande (659337) to Neset (659138) 230kV line, near Tande.</p> <ol style="list-style-type: none"> Apply fault at the Tande 230kV bus. Run 5 cycles, then open Neset end of the faulted line. Run 10 cycles, and then clear the fault and disconnect Tande (659337) 230kV line.

Contingency Number and Name		Description
44	FLT_44_PATENTGATE3SB_CHARCK3SB_345kV_1PH	<p>Single phase fault with stuck breaker on the Patentgate (659390) to Charlie Creek (659183) 345kV line, near Patentgate.</p> <p>a. Apply fault at the Patentgate 345kV bus. b. Run 5 cycles, then open Charlie Creek end of the faulted line. c. Run 10 cycles, and then clear the fault and disconnect Patentgate (659390) 345kV line.</p>
45	FLT_45_CHARCK3SB_ROUNDUP3SB_345kV_1PH	<p>Single phase fault with stuck breaker on the Charlie Creek (659183) to Round Up (659384) 345kV line, near Patentgate.</p> <p>a. Apply fault at the Charlie Creek 345kV bus. b. Run 5 cycles, then open Round Up end of the faulted line. c. Run 10 cycles, and then clear the fault and disconnect Charlie Creek (659183) 345kV line.</p>
46	FLT_46_BELFELD4SB_MEDORA4SB_230kV_1PH	<p>Single phase fault with stuck breaker on the Belfield (652425) to Medora (652413) 230kV line, near Belfield.</p> <p>a. Apply fault at the Belfield 230kV bus. b. Run 5 cycles, then open Medora end of the faulted line. c. Run 10 cycles, and then clear the fault and disconnect Belfield (652425) 230kV line.</p>
47	FLT_47_RHAME4SB_LTLMISS4SB_230kV_1PH	<p>Single phase fault with stuck breaker on the Rhame (659266) to Little Missouri (659265) 230kV line, near Rhame.</p> <p>a. Apply fault at the Rhame 230kV bus. b. Run 5 cycles, then open Little Missouri end of the faulted line. c. Run 10 cycles, and then clear the fault and disconnect Rhame (659266) 230kV line.</p>
48	FLT_48_MEDORA4SB_BEAVERHILL4SB_230kV_1PH	<p>Single phase fault with stuck breaker on the Medora (652413) to Beaver Hill (652616) 230kV line, near Medora.</p> <p>a. Apply fault at the Medora 230kV bus. b. Run 5 cycles, then open Beaver Hill end of the faulted line. c. Run 10 cycles, and then clear the fault and disconnect Medora (652413) 230kV line.</p>
49	FLT_49_DAWSONC4SB_BEAVERHILL4SB_230kV_1PH	<p>Single phase fault with stuck breaker on the Dawson County (652403) to Beaver Hill (652616) 230kV line, near Dawson County.</p> <p>a. Apply fault at the Dawson County 230kV bus. b. Run 5 cycles, then open Beaver Hill end of the faulted line. c. Run 10 cycles, and then clear the fault and disconnect Dawson County (652403) 230kV line.</p>
50	FLT_50_DAWSONC4SB_LEWIS7SB_115kV_1PH	<p>Single phase fault with stuck breaker on the Dawson County (652404) to Lewis (661056) 115kV line, near Dawson County.</p> <p>a. Apply fault at the Dawson County 115kV bus. b. Run 5 cycles, then open Lewis end of the faulted line. c. Run 10 cycles, and then clear the fault and disconnect Dawson County (652404) 115kV line.</p>

Contingency Number and Name		Description
51	FLT_51_SQBUTTE4SB_GRESTANTON4SB_230kV_1PH	<p>Single phase fault with stuck breaker on the Square Butte (657756) to Stanton (615901) 230kV line, near Square Butte.</p> <p>a. Apply fault at the Square Butte 230kV bus. b. Run 5 cycles, then open Stanton end of the faulted line. c. Run 10 cycles, and then clear the fault and disconnect Square Butte (657756) 230kV line.</p>

Results

Results of the stability analysis are summarized in Table 9. These results are valid for GEN-2015-096 interconnecting with a generation amount up to 112.5 MW. The analysis identified instability of FLT35, which is a prior outage of the Belfield-Daglum 230kV line. Further analysis identified that the output of GEN-2015-096 will need to be reduced to a maximum of 112.5MW when this outage occurs. This output amount may be reduced further dependent upon real time conditions.

Table 9: Fault Analysis Results for Limited Operation

Contingency Number and Name	2017SP	2016WP	2025SP	
1	FLT_01_TANDE3_JUDSON3_345kV_3PH	Stable	Stable	Stable
2	FLT_02_JUDSON3_PATENTGATE3_345kV_3PH	Stable	Stable	Stable
3	FLT_03_KUMMERRIDGE3_ROUNDUP3_345kV_3PH	Stable	Stable	Stable
4	FLT_04_CHARCK3_ROUNDUP3_345kV_3PH	Stable	Stable	Stable
5	FLT_05_CHARCK3_ANTELOP3_345kV_3PH	Stable	Stable	Stable
6	FLT_06_CHARCK3_BELFELD3_345kV_3PH	Stable	Stable	Stable
7	FLT_07_DAGLUM4_BELFELD4_230kV_3PH	Stable	Stable	Stable
8	FLT_08_DAGLUM4_RHAME4_230kV_3PH	Stable	Stable	Stable
9	FLT_09_BELFELD4_DICKNSN4_230kV_3PH	Stable	Stable	Stable
10	FLT_10_BELFELD4_MEDORA4_230kV_3PH	Stable	Stable	Stable
11	FLT_11_BELFELD4_SHEART4_230kV_3PH	Stable	Stable	Stable
12	FLT_12_RHAME4_BOWMAN4_230kV_3PH	Stable	Stable	Stable
13	FLT_13_RHAME4_LTLMISS4_230kV_3PH	Stable	Stable	Stable
14	FLT_14_BAKER4_MICTYE4_230kV_3PH	Stable	Stable	Stable
15	FLT_15_BOWMAN4_HETINGR4_230kV_3PH	Stable	Stable	Stable
16	FLT_16_HEBRON4_MANDAN4_230kV_3PH	Stable	Stable	Stable
17	FLT_17_BEAVERHILL4_MEDORA4_230kV_3PH	Stable	Stable	Stable
18	FLT_18_BEAVERHILL4_DAWSONC4_230kV_3PH	Stable	Stable	Stable
19	FLT_19_DAWSONC4_MICTYE4_230kV_3PH	Stable	Stable	Stable
20	FLT_20_DAWSONC4_COALHILL4_230kV_3PH	Stable	Stable	Stable
21	FLT_21_COALHILL4_FTPECK4_230kV_3PH	Stable	Stable	Stable
22	FLT_22_DAWSONC4_LEWIS7_115kV_3PH	Stable	Stable	Stable
23	FLT_23_DAWSONC4_FALLON7_115kV_3PH	Stable	Stable	Stable
24	FLT_24_DAWSONC4_CIRCLE7_115kV_3PH	Stable	Stable	Stable
25	FLT_25_DAWSONC4_GLENDCT7_115kV_3PH	Stable	Stable	Stable
26	FLT_26_TANDE3_TANDE4_345_230kV_3PH	Stable	Stable	Stable
27	FLT_27_PATENTGATE3_PATENTGATE7_345_115kV_3PH	Stable	Stable	Stable
28	FLT_28_JUDSON3_JUDSON4_345_230kV_3PH	Stable	Stable	Stable
29	FLT_29_CHARCK3_CHARCK4_345_230kV_3PH	Stable	Stable	Stable
30	FLT_30_BELFELD3_BELFELD4_345_230kV_3PH	Stable	Stable	Stable
31	FLT_31_RHAME4_RHAME7_230_115kV_3PH	Stable	Stable	Stable
32	FLT_32_BAKER4_BAKER7_230_115kV_3PH	Stable	Stable	Stable
33	FLT_33_BOWMAN4_BOWMAN7_230_115kV_3PH	Stable	Stable	Stable
34	FLT_34_DAWSONC4_DAWSONC7_230_115kV_3PH	Stable	Stable	Stable

Contingency Number and Name		2017SP	2016WP	2025SP
35	FLT_35_RHAME4PO_BOWMAN4PO_230kV_3PH	Unstable*	Unstable*	Unstable*
36	FLT_36_PATENTGATE3PO_CHARCK3PO_345kV_3PH	Stable	Stable	Stable
37	FLT_37_NESET4PO_TIOGA44PO_230kV_3PH	Stable	Stable	Stable
38	FLT_38_BELFELD4PO_MEDORA4PO_230kV_3PH	Stable	Stable	Stable
39	FLT_39_BELFELD4PO_MEDORA4PO_230kV_3PH	Stable	Stable	Stable
40	FLT_40_DAWSONC4PO_COALHILL4PO_230kV_3PH	Stable	Stable	Stable
41	FLT_41_DAWSONC4PO_MICTYE4PO_230kV_3PH	Stable	Stable	Stable
42	FLT_42_JUDSON3PO_JUDSON4PO_345_230kV_3PH	Stable	Stable	Stable
43	FLT_43_TANDE4SB_NESET4SB_230kV_1PH	Stable	Stable	Stable
44	FLT_44_PATENTGATE3SB_CHARCK3SB_345kV_1PH	Stable	Stable	Stable
45	FLT_45_CHARCK3SB_ROUNDUP3SB_345kV_1PH	Stable	Stable	Stable
46	FLT_46_BELFELD4SB_MEDORA4SB_230kV_1PH	Stable	Stable	Stable
47	FLT_47_RHAME4SB_LTLMISS4SB_230kV_1PH	Stable	Stable	Stable
48	FLT_48_MEDORA4SB_BEAVERHILL4SB_230kV_1PH	Stable	Stable	Stable
49	FLT_49_DAWSONC4SB_BEAVERHILL4SB_230kV_1PH	Stable	Stable	Stable
50	FLT_50_DAWSONC4SB_LEWIS7SB_115kV_1PH	Stable	Stable	Stable
51	FLT_51_SQBUTTE4SB_GRESTANTON4SB_230kV_1PH	Stable	Stable	Stable

*Fault 35 is unstable with GEN-2015-096 @ 150MW Interconnection Service. Fault 35 is stable with GEN-2015-096 @ 112.5 MW Interconnection Service.

FERC LVRT Compliance

FERC Order #661A places specific requirements on wind farms through its Low Voltage Ride Through (LVRT) provisions. For Interconnection Agreements signed after December 31, 2006, wind farms shall stay on line for faults at the POI that draw the voltage down at the POI to 0.0 pu.

Fault contingencies were developed to verify that wind farms remain on line when the POI voltage is drawn down to 0.0 pu. These contingencies are shown in Table 8.

Table 8: LVRT Contingencies

Contingency Number and Name		Description
1	FLT_07_DAGLUM4_BELFELD4_230kV_3PH	3 phase fault on the Daglum (659448) to Belfield (652425) 230kV line, near Daglum
2	FLT_08_DAGLUM4_RHAME4_230kV_3PH	3 phase fault on the Daglum (659448) to Rhame (659266) 230kV line, near Daglum

The required prior queued project wind farms remained online for the fault contingencies described in this section as well as the fault contingencies described in the Disturbances section of this report. GEN-2015-096 is found to be in compliance with FERC Order #661A.

Conclusion

<OMITTED TEXT> (Interconnection Customer) has requested a Limited Operation System Impact Study under the Southwest Power Pool Open Access Transmission Tariff (OATT) for a total of 150MW of wind generation to be interconnected with Energy Resource Interconnection Service (ERIS) into the Transmission System of Basin Electric Power Cooperative (BEPC)/Western Area Power Administration (WAPA) in Hettinger and Stark Counties, North Dakota. The point of interconnection will be the Daglum 230kV substation. GEN-2015-096 under GIA Section 5.9, have requested this Limited Operation Interconnection Study (LOIS) to determine the impacts of interconnecting to the transmission system before all required Network Upgrades identified in the DISIS-2015-002 (or most recent iteration) Impact Study can be placed into service. Additionally, Interconnection Customer has requested this LOIS analysis be conducted without accounting for the GEN-2015-091 generation.

Power flow analysis from this LOIS has determined that the GEN-2015-096 request can interconnect 150 MW of generation with Energy Resource Interconnection Service (ERIS) prior to the completion of the required Network Upgrades, listed within

Table 2

Table 2 of this report. The power flow interconnection service amount would be limited by the LOIS amount determined by the transient stability analysis as mentioned below. If the Dickinson 230/115/13kV transformer circuit #2 is not in-service by 1/2020, then GEN-2015-096 could be limited to a reduced amount of 105 MW with the Table 1 assumptions. If the Dickinson 230/115/13kV transformer circuit #2 is not in-service by 1/2025, then GEN-2015-096 could be limited to 0 MW with the Table 1 assumptions. Should any other projects, other than those listed within Table 1 of this report, come into service an additional study may be required to determine if any limited operation service is available. Refer to **Error! Reference source not found.** for the Limited Operation Interconnection Service available due to interconnection constraints.

The stability analysis identified instability for the prior outage of the Belfield-Daglum 230kV line. Further analysis identified that the output of GEN-2015-096 will need to be reduced to a maximum of 112.5MW when this outage occurs. This output amount may be reduced further dependent upon real-time conditions.

The power flow analysis for this LOIS observed constraints on Affected Systems and the Limited Operation amounts provided within this LOIS report are subject to Affected System Limited Operation Impact Study analysis and results. Should the Interconnection Customer elect to continue with LOIS, the Interconnection Customer will need to coordinate with the Affected System Parties for Affected System Limited Operation Impact Study or an equivalent study. Affected System constraints with 3% distribution impact factor are in the Appendix A (Affected System Thermal Constraints) and Appendix B (Affected System Voltage Constraints). Any additional Affected System constraints observed in the DISIS-2015-002 or latest restudy could be evaluated by the Affected System party for the Affected System Limited Operation Impact Study.

Transient stability analysis indicates that generation will trip offline for fault 51 listed in the contingencies within Table 8 with the addition of GEN-2015-096 generation. The stability analysis has determined that reduced total of 112.5MW of generation can interconnect prior to the completion of the Network Upgrades, listed within Table 2 of this report. Additionally, GEN-2015-096 was found to be in compliance with FERC Order #661A when studied as listed within this report.

Any changes to these assumptions, for example, one or more of the previously queued requests not included within this study execute an interconnection agreement and commencing commercial operation, may require a re-study of this LOIS at the expense of the Customer.

Nothing in this System Impact Study constitutes a request for transmission service or confers upon the Interconnection Customer any right to receive transmission service.

Appendices

A: Affected System Thermal Power Flow Analysis (Constraints for Potential Transmission Reinforcement)

See next page.

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	17SP	G15_096		Non-Converged Contingency			0.09395	-	CHISAGO COUNTY - FORBES 500KV CKT 1
16ALL	16WP	G15_096		Non-Converged Contingency			0.0378	-	ELLEDDALE - OAKES 230KV CKT 1
16ALL	17G	G15_096		Non-Converged Contingency			0.03845	-	ELLEDDALE - OAKES 230KV CKT 1
16ALL	17SP	G15_096		Non-Converged Contingency			0.03849	-	ELLEDDALE - OAKES 230KV CKT 1
16ALL	17SP	G15_096		Non-Converged Contingency			0.08823	-	FORBES - ROSEAU 500KV CKT 1
16ALL	17SP	G15_096		Non-Converged Contingency			0.08823	-	ROSEAU - ROSEAU 2 500.00 500KV CKT 1
16ALL	17SP	G15_096		Non-Converged Contingency			0.08823	-	ROSEAU - ROSEAU 2 500.00 500KV CKT 1
16ALL	17SP	G15_096	TO->FROM	AUDUBON - SHEYNNÉ 230KV CKT 1	280	280	0.04724	99.2	ALEXMRES3 345.00 - BISON 3 345.00 345KV CKT 1
0	17SP	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	102	102	0.0463	245.7789	CENTER - COYOTE 345KV CKT 1
0	20SP	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	102	102	0.04645	201.5824	CENTER - COYOTE 345KV CKT 1
0	25SP	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	102	102	0.0464	218.1782	CENTER - COYOTE 345KV CKT 1
0	16WP	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	120	123	0.04641	253.4313	CENTER - COYOTE 345KV CKT 1
0	20WP	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	120	123	0.04648	248.2932	CENTER - COYOTE 345KV CKT 1
16ALL	16WP	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	120	123	0.0465	262.703	CENTER - COYOTE 345KV CKT 1
16ALL	17G	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	102	102	0.04667	288.8038	CENTER - COYOTE 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	102	102	0.04637	258.6209	CENTER - COYOTE 345KV CKT 1
16ALL	20L	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	102	102	0.04642	168.7198	CENTER - COYOTE 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	102	102	0.04652	216.6312	CENTER - COYOTE 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	120	123	0.0466	257.7712	CENTER - COYOTE 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BEULAH - COYOTE 115KV CKT 1	102	102	0.04647	232.9564	CENTER - COYOTE 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.8393	BASE CASE
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10601	99.3	ANTELOP-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10601	99.4	BROADLAND - HURON 230KV CKT 1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10618	99	FTTHOM1-LNX3345.00 - LELAND2-LNX3345.00 345KV CKT 1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10666	101.261	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10226	99.2	G09_0011ST 345.00 - WATERTOWN 345KV CKT 1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10601	99.7	ANTELOP-LNX3345.00 - BRDLAND-LNX3345.00 345KV CKT 1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10601	99.4	BRDLAND-LNX3345.00 - HURON 345KV CKT Z
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10666	101.2778	LELANDOLDS-GROTON-TLINE-REACTORS-CKT1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10666	101.2684	GROTON - GROTON-LNX3 345.00 345KV CKT Z
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10601	99.4	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10601	99.4	ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10666	101.3999	GROTON-LNX3 345.00 - LELAND1-LNX3345.00 345KV CKT 1
16ALL	17G	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10725	100.3808	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	17G	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10725	100.3856	GROTON - GROTON-LNX3 345.00 345KV CKT Z
16ALL	17G	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10655	99.2	ANTELOP-LNX3345.00 - BRDLAND-LNX3345.00 345KV CKT 1
16ALL	17G	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10725	100.3955	LELANDOLDS-GROTON-TLINE-REACTORS-CKT1
16ALL	17G	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10725	100.634	GROTON-LNX3 345.00 - LELAND1-LNX3345.00 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08389	100.095	BELFIELD - DICKINSON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1079	108.9948	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10255	106.0049	FARGO - JAMES TOWN 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6121	GEN336252 1-NINEMILE POINT UNIT#5
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09526	99.9	GRANITE FALLS - MORRIS 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.7525	GEN338143 1-INDEPENDENCE UNIT #1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10311	102.1373	MAURINE - NUNDRWD-LNX3230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10055	103.3193	WATERTN-LNX3345.00 - WATERTOWN 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10807	106.1573	FT THOMPSON - FTTHOM1-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0816	104.8171	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10222	102.9918	GRANTE FALLS - MANDAN 4 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.1504	GEN636641 1-LOUISA UNIT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6412	WATFORD (WC KV1A) 230/115/13.2KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.5817	GEN344895 2-1LAB G2 20.000
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.2561	GEN336153 1-WATERFORD UNIT#3
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10151	102.6723	SULLEY BUTTE - SULLYBT-LNX3230.00 230KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.6	GEN659118 1-LARAMIE RIVER UNIT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.11212	104.3495	BISON - MAURINE 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	104.8416	GEN600000 1-SHERBURNECNTY G1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6242	GEN345671 2-1RUSH G2 18.000
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.5909	GEN337041 1-GERALD ANDRUS
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	101.4858	MERRCRT4 230.00 - WISHEK 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10807	109.1345	FTTHOMPSON-LELANDOLDS-TLINE-REACTORS-CKT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09473	100.1779	CHARLIE CREEK - KILDEER 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09749	101.4421	CALEDONIA - EGF IND 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.4857	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.0745	GEN652557 4-OAHE
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6562	GEN615052 1-CAMBRIDGE GENERATING STATION
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6081	GEN336831 1-BAXTER WILSON SES
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08873	100.1581	HEBRON 4 230.00 - MANDAN 4 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.3	RCDC EAST 4230.00 - RED CEDAR DC 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.5014	GEN629072 4-LANSING GENERATOR FOR UNITS NO4 EIA CODE 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEA (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.8	GEN659273 2-GROTON SYNC COND
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09763	101.7909	FALCONER - GRAND FORKS 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.106	GEN681542 6-JP MADGETT
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6056	GEN344894 1-1LAB G1 20.000
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.0745	GEN652558 6-OAHE
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09747	102.3149	STORLA - WESSINGTON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6041	GEN657988 1-ROFRGEN9 0.6900
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09756	101.7682	LETCHER - SIOUX FALLS 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09783	102.073	FT RANDAL - FT THOMPSON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09747	101.8029	FT THOMPSON - WESSINGTON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10807	108.8841	LELAND OLDS - LELAND2-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.7721	GEN681522 3-GENOA 3
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09763	101.878	CARPENTER - HURON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10151	102.6366	SULLYBUTTE-WHITLOCK-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10311	102.1373	NUNDRWOOD-MAURIN-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10162	107.3062	FTTHOM2-LNX3345.00 - GRPRAR2-LNX3345.00 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1079	106.4386	ANTELOP-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09741	101.6722	ELLENDALE - MERRCRT4 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09773	102.2708	HANLON - STORLA 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.1	GEN659018 1-G14_003IS_3 0.6900
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10162	104.563	GRPRAR1-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09576	100.0764	FARGO - MOOREHEAD 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09756	101.9065	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.3273	GEN344225 1-1CAL G1 25.000
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09747	101.6897	KELLY - MEADOWGROVE4230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09763	101.8286	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1009	102.4908	NUNDRWD - WAYSIDE 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10162	106.0441	FTTHOMPSON-GRANDPRAIRIE-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09756	101.9528	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.8	GEN672306 6-BOUNDARY DAM GENERATOR 6
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.8	GEN659294 1-WILTONCOL9
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10151	102.6366	SULLYBT-LNX3230.00 - WHITLCK 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09781	101.9283	FT RANDAL - LAKE PLATT 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09454	99.7	MOOREHEAD - MORRIS 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.5569	GARDENCK2MK7115.00 - WATFORD 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.9	GEN672311 2-POPLAR RIVER GENERATOR 2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10519	106.0508	FARGO - SHEYNE 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.8209	GEN657964 1-ASH2GEN9 0.5750
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10153	103.7725	GLENHAM - L3 HAWDON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.9	GEN672310 1-POPLAR RIVER GENERATOR 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.0796	GEN335831 1-RIVERBEND UNIT#1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09781	102.0195	FT THOMPSON - LAKE PLATT 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10162	104.0619	FT THOMPSON - FTTHOM2-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10162	104.563	GRANDPRAIRIE-HOLT-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6994	GEN337653 1-WHITE BLUFF UNIT #2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.5046	GEN300007 1-NEW MADRID UNIT 2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09756	101.9089	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.4624	FNCYBTAP-MK7115.00 - SCHAFFER -MK7115.00 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.7887	GEN629075 1-OTTUMWA GENERATOR FOR OTTUMWA UNIT NO 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.5524	GEN501801 1-DOLET HILLS UNIT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09749	101.5907	EGF IND - GRAND FORKS 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.974	GEN337911 1-ARKANSAS NUCLEAR ONE UNIT #2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10055	103.307	WATERTOWN-WHITE-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6241	GEN345670 1-1RUSH G1 18.000
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1011	104.274	BISMARCK - JAMES TOWN 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.8054	GEN600004 2-PRAIRIE ISLAND G2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09612	100.0769	CHARLIE CREEK (CCR KV2A) 345/115/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	105.9399	GEN600002 3-SHERBURNE CNTY G3
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10026	104.4537	GARRISON - JAMES TOWN 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.5611	GEN300003 1-THOMAS HILL UNIT 3
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	105.1735	GEN600001 2-SHERBURNE CNTY G2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.0745	GEN652556 2-OAHE
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1079	108.9954	BROADLAND - HURON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.5636	GEN501813 1-RODEMACHER UNIT 3
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09744	101.5176	SIDNEY - STEGALL 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10238	105.8532	FARGO - JAMES TOWN 230KV CKT 2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1079	108.9976	BRDLAND-LNX3345.00 - HURON 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09733	101.4788	LEEDS - PLEASANT LK7115.00 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6966	GEN337652 1-WHITE BLUFF UNIT #1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10311	102.1286	NUNDRWD - NUNDRWD-LNX3230.00 230KV CKT Z

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.7359	GRAND FORKS - PRAIRIE 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.2	GEN 10572 2-J290 MK10 0.6900
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.0058	GEN629074 1-ARNOLD LOWSIDE OF GSU XFMR
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10109	104.5597	BISMARCK - WEBER 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10862	108.087	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.6	GEN620115 4-HRDLKGEN 0.6000
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09174	100.0508	LELAND OLDS - STANTON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.7939	GEN337910 1-ARKANSAS NUCLEAR ONE UNIT #1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.1711	GEN620172 1-JAMES TOWN PEAKER
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6056	GEN344896 3-1LAB G3 20.000
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1079	109.1216	ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6072	GEN344897 4-1LAB G4 20.000
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10151	102.7722	GLENHAM - WHITLOCK 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.5063	GEN300006 1-NEW MADRID UNIT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.7234	GEN600067 9-HIGH BRIDGE
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.11212	104.5632	BISON - HETINGER 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10192	101.6262	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.0744	GEN652414 4-FT PECK
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.7634	GEN338146 1-INDEPENDENCE UNIT #2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	101.6589	HESKETT - WISHEK 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6057	GEN336251 1-NINEMILE POINT UNIT#4
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.0744	GEN652415 5-FT PECK
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10162	104.558	GRPRAR1-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10162	105.8473	GRPRAR2-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10492	101.6198	BOWMAN - RHAME 4 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09775	102.3525	GRAND FORKS (GK KV1A) 230/115/12.47KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.1394	GEN652410 3-FT PECK
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.9	GEN672321 1-SHAND GENERATOR 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10222	102.4681	BISMARCK - GRANTE FALLS 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.5703	GEN336821 1-GRAND GULF UNIT
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.8099	GEN600003 1-PRAIRIE ISLAND G1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10109	104.4741	JAMES TOWN - WEBER 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10162	106.0441	GRANDPRAIRIE-FTTHOMPSON-TLINE-REACTORS-CKT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.076	GEN652559 1-OAHE
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09746	101.5918	APPLEDORN 4 230.00 - WATERTOWN 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.1242	GEN659158 2-PIONEER G213.800
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09755	101.5711	J316 SUB 230.00 - TATANKA 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10153	103.0254	BISMARCK - L3 HAWDON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10807	109.348	FTTHOMPSON-LELANDOLDS-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	103.1352	GEN600006 1-AS KING
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.7116	GEN620315 1-BIG STONE GEN
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10151	102.494	OAHE - SULLEY BUTTE 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09733	101.4998	PLEASANT LK7115.00 - RUGBY 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09767	102.422	FT THOMPSON - LETCHER 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.1242	GEN659159 3-PIONEER G313.800
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09755	102.6045	ELLENDALE - J316 SUB 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09763	101.8721	HURON - WATERTOWN 230KV CKT 2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6817	GEN615021 1-GRE-ER 14G 16.000
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	104.3203	GEN600005 1-MONTICELLO
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10592	106.0578	FT THOMPSON - FTTHOM1-LNX3345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4023	GEN344894 1-1LAB G1 20.000
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0978	102.1964	WATERTN-LNX3345.00 - WATERTOWN 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.5166	GEN681522 3-GENOA 3
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09568	101.2719	CARPENTER - HURON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.9	GEN659163 5-BLACK WDCK
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09932	101.7389	OAHE - SULLEY BUTTE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.1852	GEN336464 1-MICHOU UNIT #3
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09579	101.4624	ELLENLDMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10628	107.7044	LELANDOLDS-GROTON-TLINE-REACTORS-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2541	GEN620315 1-BIG STONE GEN
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.3339	GEN620324 3-HOOT LAKE 3 GEN
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10957	102.9019	BISON - MAURINE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09971	103.4743	GRPRAR2-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.3	RCDC EAST 4230.00 - RED CEDAR DC 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10628	107.6965	GROTON - GROTON-LNX3 345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10628	107.8736	GROTON-LNX3 345.00 - LELAND1-LNX3345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10592	106.2304	FTTHOM1-LNX3345.00 - LELAND2-LNX3345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0936	99.9	GRANITE FALLS - MORRIS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09932	101.9115	SULLYBT-LNX3230.00 - WHITLOCK 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2221	GEN600070 9-RIVER SIDE

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	104.7848	GEN600001 2-SHERBURNE CNTY G2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09516	101.4194	GRAND FORKS - PRAIRIE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09933	102.7213	GLENHAM - L3 HAWDON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09916	104.0801	BISMARCK - JAMES TOWN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09564	101.286	APPLEDORN 4 230.00 - WATERTOWN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.2	GEN 10572 2-J290_MK10 0.6900
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	100.5211	BASE CASE
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09971	103.6119	FTTHOM2-LNX3345.00 - GRPRAR2-LNX3345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09915	103.9924	JAMES TOWN - WEBER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10628	107.6948	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.1965	GEN600066 8-HIGH BRIDGE
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.4	GEN620115 4-HRDLKGEN 0.6000
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.1965	GEN600065 7-HIGH BRIDGE
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.1	GEN659018 1-G14_003IS 3 0.6900
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2001	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09915	104.0793	BISMARCK - WEBER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09933	102.5005	BISMARCK - L3 HAWDON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09971	104.0656	GRPRAR1-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09602	101.527	J316_SUB 230.00 - TATANKA 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09845	104.1807	GARRISON - JAMES TOWN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10095	101.4096	MAURINE - NUNDRWD-LNX3230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10053	105.3563	FARGO - JAMES TOWN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.9	GEN672306 6-BOUNDARY DAM GENERATOR 6
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10103	105.9444	G09_001IST 345.00 - WATERTOWN 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4088	GEN615021 1-GRE-ER 14G 16.000
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09274	99.5	MOOREHEAD - MORRIS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2983	GEN300003 1-THOMAS HILL UNIT 3
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09971	104.0914	GRPRAR1-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09971	103.437	FT THOMPSON - FTTHOM2-LNX3345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10103	105.3915	G09_001IST 345.00 - GROTON 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	102.5797	GEN600004 2-PRAIRIE ISLAND G2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.1849	GEN336801 1-BAXTER WILSON UNIT #1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0959	101.9431	GRAND FORKS (GK KV1A) 230/115/12.47KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09557	101.6595	STORLA - WESSINGTON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09932	101.9075	SULLEY BUTTE - SULLYBT-LNX3230.00 230KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.3574	GEN615052 1-CAMBRIDGE GENERATING STATION
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2719	GEN33888 1-1PLUM PT U1 23.000
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09564	101.2254	APPLEDORN 4 230.00 - GRANITE FALLS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09859	101.5415	NUNDRWD - WAYSIDE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4415	GEN336831 1-BAXTER WILSON SES
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09972	102.2657	GRANTE FALLS - MANDAN 4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.7546	GEN629074 1-ARNOLD LOWSIDE OF GSU XFMR
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	104.3427	GEN600005 1-MONTICELLO
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.8253	GEN337911 1-ARKANSAS NUCLEAR ONE UNIT #2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0961	103.7566	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.181	GEN335614 1-WILLOW GLENN UNIT#4
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09549	101.1115	PLEASANT LK7115.00 - RUGBY 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09556	101.3686	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.9	GEN652414 4-FT PECK
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.9	GEN659162 4-RED WLCK
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	106.3539	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.4	GEN659118 1-LARAMIE RIVER UNIT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.3102	GEN501801 1-DOLET HILLS UNIT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4032	GEN344897 4-LAB G4 20.000
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.5208	GEN337653 1-WHITE BLUFF UNIT #2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	106.3539	BROADLAND - HURON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	106.3055	ANTELOP-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2002	GEN334440 1-SABINE UNIT 4
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09602	102.4944	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.3152	GEN501813 1-RODEMACHER UNIT 3
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10037	105.2165	FARGO - JAMES TOWN 230KV CKT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2306	GEN336191 1-LITTLE GYPSY UNIT#3
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09586	101.3712	FT THOMPSON - LAKE PLATT 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09565	101.4098	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0978	102.3407	WATERTN-LNX3345.00 - WHITE 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10592	106.1073	FTTHOMPSON-LELANDOLDS-TLINE-REACTORS-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09394	99.8	FARGO - MOOREHEAD 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10095	101.4119	NUNDRWD - NUNDRWD-LNX3230.00 230KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.5657	GEN338146 1-INDEPENDENCE UNIT #2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.1448	GEN635024 4-WALTER SCOTT UNIT 4

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.314	GEN657988 1-ROFRGEN9 0.6900
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2362	GEN335206 1-NELSON UNIT 6
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08099	105.3503	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	104.4803	GEN600000 1-SHERBURNECNTY G1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.7	GEN659294 1-WILTONCOL9
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09586	101.2935	FT RANDAL - LAKE PLATT 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4023	GEN344896 3-1LAB G3 20.000
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09566	101.2394	EGF IND - GRAND FORKS 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10652	103.6377	MERRCRT4 230.00 - WISHEK 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10095	101.4096	NUNDERWOOD-MAURIN-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09577	101.4193	FALCONER - GRAND FORKS 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.5021	GEN337652 1-WHITE BLUFF UNIT #1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09464	100.3262	JAMES TOWN - PICKERT 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09565	101.4014	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	102.4777	GEN336821 1-GRAND GULF UNIT
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	106.3914	ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	106.6402	ANTELOP-LNX3345.00 - BRDLAND-LNX3345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09994	101.3516	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4169	GEN345670 1-1RUSH G1 18.000
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09932	102.0019	GLENHAM - WHITLOK 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10276	101.3434	BOWMAN - RHAME 4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09972	101.7198	BISMARK - GRANTE FALLS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09971	103.4352	FTTHOMPSON-GRANDPRAIRIE-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09685	102.4417	GR ISLD-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0956	101.295	KELLY - MEADOWGROVE4230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.9	GEN672311 2-POPLAR RIVER GENERATOR 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08262	99.8	BELFIELD - DICKINSON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10339	105.9414	FARGO - SHEYNE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.1751	GEN501812 1-RODEMACHER UNIT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	102.5834	GEN600003 1-PRAIRIE ISLAND G1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09566	101.0886	CALEDONIA - EGF IND 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4929	GEN336252 1-NINEMILE POINT UNIT#5
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09971	104.0653	GRANDPRAIRIE-HOLT-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.9	GEN672310 1-POPLAR RIVER GENERATOR 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09899	101.4727	HESKETT - MANDAN 4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2176	GEN600017 C-LS POWER CT
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.7	GEN659273 2-GROTON SYNC COND
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.5787	GEN657964 1-ASH2GEN9 0.5750
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09574	101.7157	FT THOMPSON - LETCHER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09568	101.2238	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09565	101.4183	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	105.4308	GEN600002 3-SHERBURNE CNTY G3
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.227	GEN300007 1-NEW MADRID UNIT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2312	GEN600007 7-RIVERSIDE GEN 7
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10592	106.1341	FTTHOMPSON-LELANDOLDS-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.222	GEN600071 10-RIVER SIDE
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0978	102.1906	WATERTOWN-WHITE-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4316	GEN337041 1-GERALD ANDRUS
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09557	101.2179	FT THOMPSON - WESSINGTON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.9	GEN652415 5-FT PECK
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.9	GEN672321 1-SHAND GENERATOR 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	102.2109	GEN344225 1-1CAL G1 25.000
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	102.1279	GEN336153 1-WATERFORD UNIT#3
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0977	103.275	ELLENLDMVP3 345.00 (1) 345/230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4754	GEN600067 9-HIGH BRIDGE
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09568	101.2536	HURON - WATERTOWN 230KV CKT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09971	103.4352	GRANDPRAIRIE-FTTHOMPSON-TLINE-REACTORS-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10652	103.8188	HESKETT - WISHEK 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09588	101.3831	FT RANDAL - FT THOMPSON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.9383	GEN335831 1-RIVERBEND UNIT#1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.942	GEN636641 1-LOUISA UNIT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09932	101.9112	SULLYBUTTE-WHITLOCK-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08979	99.6	LELAND OLDS - STANTON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2284	GEN300006 1-NEW MADRID UNIT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2156	GEN629072 4-LANSING GENERATOR FOR UNITS NO4 EIA CODE 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	106.3541	BRDLAND-LNX3345.00 - HURON 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4516	GEN336251 1-NINEMILE POINT UNIT#4
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0977	103.2861	BSSOUTH3 345.00 - ELLENLDMVP3 345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4023	GEN344895 2-1LAB G2 20.000
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.5981	GEN629075 1-OTTUMWA GENERATOR FOR OTTUMWA UNIT NO 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.556	GEN338143 1-INDEPENDENCE UNIT #1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.6291	GEN337910 1-ARKANSAS NUCLEAR ONE UNIT #1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09566	101.2233	LETCHER - SIOUX FALLS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10957	103.3991	BISON - HETINGER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4199	GEN345671 2-1RUSH G2 18.000
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	102.8041	GEN600006 1-AS KING
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.8219	GEN681542 6-JP MADGETT
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09685	102.4	GR ISLD-LNX3345.00 - GRAND ISLAND 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10592	106.0487	LELAND OLDS - LELAND2-LNX3345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0958	101.6663	HANLON - STORLA 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.8426	GEN629075 1-OTTUMWA GENERATOR FOR OTTUMWA UNIT NO 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0999	109.2797	BISMARCK - GRANTE FALLS 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.7013	GEN336251 1-NINEMILE POINT UNIT#4
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.8811	GEN600003 1-PRAIRIE ISLAND G1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09919	108.825	HESKETT - MANDAN 4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	107.7644	BASE CASE
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0995	109.375	SULLYBT-LNX3230.00 - WHITLCK 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	110.148	GEN600006 1-AS KING
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5939	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	101.3488	GEN615015 1-GRE-SPRITWDG13.200
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09577	108.5397	FT THOMPSON - WESSINGTON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.2285	GEN659018 1-G14_003IS 3 0.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09791	110.2797	BSSOUTH3 345.00 - ELLENDLMVP3 345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	111.7049	GEN600000 1-SHERBURNECNTY G1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09581	108.6033	KELLY - MEADOWGROVE4230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	112.9409	GEN600002 3-SHERBURNE CNTY G3
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09608	108.707	FT RANDAL - FT THOMPSON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10585	113.5741	ANTELOP-LNX3345.00 - BRDLAND-LNX3345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10649	114.9692	GROTON-LNX3 345.00 - LELAND1-LNX3345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08996	107.1223	LELAND OLDS - STANTON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	107.0608	GEN652414 4-FT PECK
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09993	111.1326	GRANDPRAIRIE-HOLT-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.8989	GEN659273 2-GROTON SYNC COND
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	104.8859	GEN657745 1-MPC02100GEN90.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10353	113.1094	FARGO - SHEYNE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09801	109.5799	WATERTN-LNX3345.00 - WATERTOWN 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09485	107.442	JAMES TOWN - PICKERT 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0995	109.4261	SULLEY BUTTE - SULLYBT-LNX3230.00 230KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	101.2989	GEN659107 2-ANTELOPE VALLEY UNIT2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10585	113.6241	ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.7294	GEN615021 1-GRE-ER 14G 16.000
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5434	GEN501801 1-DOLET HILLS UNIT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5548	GEN590010 1-ERCOT EQUIVALENCE
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.6429	GEN344896 3-1LAB G3 20.000
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.8212	GEN657964 1-ASH2GEN9 0.5750
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.0153	GEN659366 3-WILTON 3 W0.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.6681	GEN337041 1-GERALD ANDRUS
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5532	GEN501813 1-RODEMACHER UNIT 3
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09585	108.7349	SIDNEY - SIDNEY1-LNX3345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09595	109.0528	FT THOMPSON - LETCHER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10112	108.7139	NUNDRWD - NUNDRWD-LNX3230.00 230KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10297	108.7489	BOWMAN - RHAME 4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5244	GEN620315 1-BIG STONE GEN
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	101.2989	GEN659103 1-ANTELOPE VALLEY UNIT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.0032	GEN652459 3-GARRISON
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.3089	GEN 10572 2-J290_MK10 0.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.9717	GEN620172 1-JAMES TOWN PEAKER
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.171	GEN335831 1-RIVERBEND UNIT#1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09936	111.3118	JAMES TOWN - WEBER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.9748	GEN563342 1-G15098 3 0.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09584	108.5946	APPLEDORN 4 230.00 - WATERTOWN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09599	108.7926	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09993	111.2952	GRPRAR1-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.6312	GEN615052 1-CAMBRIDGE GENERATING STATION
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10649	114.767	GROTON - GROTON-LNX3 345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.8989	GEN659294 1-WILTONCOL9
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09622	109.9509	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.4947	RCDC EAST 4230.00 - RED CEDAR DC 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5786	GEN590011 2-ERCOT EQUIVALENCE
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10112	108.766	MAURINE - NUNDRWD-LNX3230.00 230KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.7762	GEN681522 3-GENOA 3
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09586	108.535	LETCHER - SIOUX FALLS 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09617	109.3231	GRAND FORKS (GK KV1A) 230/115/12.47KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09876	108.9257	NUNDRWD - WAYSIDE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09937	111.4065	BISMARCK - JAMES TOWN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.6034	GEN659403 1-INDSUNFLWR W0.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09993	110.7577	FTTHOM2-LNX3345.00 - GRPRAR2-LNX3345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.6428	GEN344894 1-1LAB G1 20.000
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09936	111.4032	BISMARCK - WEBER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.872	GEN338146 1-INDEPENDENCE UNIT #2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10612	113.0324	LELAND OLDS - LELAND2-LNX3345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5543	GEN300007 1-NEW MADRID UNIT 2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09601	109.0231	HANLON - STORLA 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09606	108.6852	FT THOMPSON - LAKE PLATT 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.428	GEN344225 1-1CAL G1 25.000
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.6915	GEN336821 1-GRAND GULF UNIT
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09952	109.9954	BISMARCK - L3 HAWDON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.6817	GEN336831 1-BAXTER WILSON SES
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.0032	GEN652458 2-GARRISON
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10612	113.1816	FTTHOMPSON-LELANDOLDS-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09622	108.8648	J316 SUB 230.00 - TATANKA 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10585	113.5809	BRDLAND-LNX3345.00 - HURON 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0995	109.2525	OAHE - SULLEY BUTTE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.0239	GEN629074 1-ARNOLD LOWSIDE OF GSU XFMR
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.1862	GEN563302 1-G15096_3 0.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	102.3186	GEN615010 1-STANTON4
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09706	109.7608	GR ISLD-LNX3345.00 - GRAND ISLAND 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10673	111.3592	MERRCRT4 230.00 - WISHEK 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09294	106.8258	MOOREHEAD - MORRIS 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.8032	GEN337652 1-WHITE BLUFF UNIT #1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10612	113.0551	FT THOMPSON - FTTHOM1-LNX3345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09801	109.8375	WATERTN-LNX3345.00 - WHITE 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0995	109.5261	GLENHAM - WHITLOK 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09952	110.3331	GLENHAM - L3 HAWDON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.0016	GEN659010 4-G07_027IS 2_0.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.2033	GEN636641 1-LOUISA UNIT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.7549	GEN337653 1-WHITE BLUFF UNIT #2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09584	108.4006	CALEDONIA - EGF IND 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10015	108.6924	DAGLUM 4230.00 - RHAME 4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.7931	GEN 10648 1-G830_GEN 0.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09577	109.0167	STORLA - WESSINGTON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09993	110.6974	FTTHOMPSON-GRANDPRAIRIE-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.0376	GEN337911 1-ARKANSAS NUCLEAR ONE UNIT #2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09585	108.7365	SIDNEY-KEYSTONE-TLINE-REACTORS-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09588	108.5737	HURON - WATERTOWN 230KV CKT 2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.4776	GEN336191 1-LITTLE GYPSY UNIT#3
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.4751	GEN335206 1-NELSON UNIT 6
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.6743	GEN620115 4-HRDLKGEN 0.6000
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.6579	GEN345670 1-1RUSH G1 18.000
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	101.367	GEN659125 1-COVEY
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	104.9807	GEN659407 1-ANTELPILLSW0.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10124	112.2159	G09_0011ST 345.00 - GROTON 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09993	110.5851	GRPRAR2-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10649	114.7416	LELANDOLDS-GROTON-TLINE-REACTORS-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09588	108.5926	CARPENTER - HURON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10585	113.5804	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10977	110.5614	BISON - HETINGER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10124	112.8274	G09_0011ST 345.00 - WATERTOWN 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09866	111.4758	GARRISON - JAMES TOWN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10612	113.2992	FTTHOM1-LNX3345.00 - LELAND2-LNX3345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10072	112.7152	FARGO - JAMES TOWN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09608	108.8091	FALCONER - GRAND FORKS 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09414	107.0412	FARGO - MOOREHEAD 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10673	111.3503	HESKETT - WISHEK 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	99.6	GEN657749 1-YOUNG 1 GENERATOR
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.7813	GEN652461 5-GARRISON
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09791	110.3773	ELLENLDMV3 345.00 (1) 345/230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5595	GEN657988 1-ROFRGEN9 0.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09585	108.758	KEYSTONE - SIDNEY1-LNX3345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	102.6154	GEN562872 1-G15046_3 0.6900

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09706	109.8089	GR ISLD-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09993	111.1332	GRPRAR1-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	104.5494	GEN659110 1-LELAND OLDS UNIT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10112	108.766	NUNDERWOOD-MAURIN-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09588	108.5405	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.22	GEN659453 1-GH1414GEN WO.6900
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0995	109.3767	SULLYBUTTE-WHITLOCK-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10585	113.5806	BROADLAND - HURON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.0032	GEN652457 1-GARRISON
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	107.0608	GEN652415 5-FT PECK
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.6428	GEN344895 2-1LAB G2 20.000
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0999	109.9294	GRANTE FALLS - MANDAN 4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09993	110.5316	FT THOMPSON - FTTHOM2-LNX3345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5644	GEN338388 1-1PLUM PT U1 23.000
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.7813	GEN652460 4-GARRISON
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10612	113.1128	FTTHOMPSON-LELANDOLDS-TLINE-REACTORS-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	111.7646	GEN600001 2-SHERBURNE CNTY G2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	101.7573	GEN659111 2-LELAND OLDS UNIT2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09606	108.5991	FT RANDAL - LAKE PLATT 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	111.5	GEN600005 1-MONTICELLO
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.5301	GEN659118 1-LARAMIE RIVER UNIT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.7444	GEN600067 9-HIGH BRIDGE
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.0815	GEN659141 1-K10215A
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.6437	GEN344897 4-1LAB G4 20.000
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.0679	GEN681542 6-JP MADGETT
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0963	110.9966	ELENLDMLVP4 230.00 - OAKES 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08116	114.0222	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10977	110.2539	BISON - MAURINE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09576	108.6932	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09584	108.5633	EGF IND - GRAND FORKS 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09538	108.6367	GRAND FORKS - PRAIRIE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10056	112.5676	FARGO - JAMES TOWN 230KV CKT 2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.6454	GEN300003 1-THOMAS HILL UNIT 3
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.8772	GEN600004 2-PRAIRIE ISLAND G2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09993	110.517	GRANDPRAIRIE-FTTHOMPSON-TLINE-REACTORS-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10649	114.7651	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09801	109.567	WATERTOWN-WHITE-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.7428	GEN336252 1-NINEMILE POINT UNIT#5
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.8603	GEN337910 1-ARKANSAS NUCLEAR ONE UNIT #1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.8606	GEN338143 1-INDEPENDENCE UNIT #1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.6608	GEN345671 2-1RUSH G2 18.000
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5559	GEN300006 1-NEW MADRID UNIT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0828	107.0362	BELFIELD - DICKINSON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10585	113.5021	ANTELOP-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.3421	GEN336153 1-WATERFORD UNIT#3
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10187	100	GLENBORO SOUTH - J290 SUB 230.00 230KV CKT 1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10601	99.4	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10666	101.2778	P12:345:UMZB:# 109 #: LOS GRT IN ND. LOS GRT
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.09522	99.4	MAPLE RIVER - PILSBRY4 230.00 230KV CKT 1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10114	100.7236	FORMAN - HANKINSON 230KV CKT 1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10601	99.4	P12:345:UMZB:# 102 #: AVS BD IN ND. AVS BRD LR
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10601	99.4	P12:345:UMZB:# 103 #: BD IN SD. LOSS OF LINE
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.09638	99.4	HANKINSON - WAHPETON 230KV CKT 1
16ALL	16WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10914	110.3548	CNTSHNT3 345.00 - PRAIRIE3 345.00 345KV CKT 1
16ALL	17G	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10725	100.3955	P12:345:UMZB:# 109 #: LOS GRT IN ND. LOS GRT
16ALL	17G	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1019	100	FORMAN - HANKINSON 230KV CKT 1
16ALL	17G	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1099	107.2471	CNTSHNT3 345.00 - PRAIRIE3 345.00 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09831	103.0302	PRAIRIE - RAMSEY 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09544	100.0879	SQUARE BUTTE - STANTON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09653	100.1515	CSLTNET7 115.00 - MAPLE RIVER TAP NORTH 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.6984	BIG STONE 230/24.0KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09711	101.505	BIG STONE (230/115) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10151	102.7122	P12:230:UMZB:# 114 #: SB IN SD. SB-WK-GH
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0816	104.8171	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10519	106.0508	FARGO - SHEYNE 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09454	99.6	P12:230:UMZW:# 156 #: MDOE IN MN. LINE FAULT CAUSES LOSS OF MH 230KV BUS
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0955	100.1051	LAKEFIELD 3 - LKFLDXL3 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09712	101.5417	LUND - RUNNING 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09619	99.2	ELM CREEK - MONTICELLO 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100	ANSON (ANS 1) 115/13.8/13.8KV TRANSFORMER CKT 2

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09938	105.4275	CHISAGO COUNTY - CHISAGO COUNTY 500KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1079	108.9948	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09865	102.0245	BALTA - HARVEY 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09114	100.5044	MONTICELLO - WAITE PARK 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09746	101.5918	APPLEDORN 4 230.00 - WATERTOWN 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10055	103.307	P12:345:UMZW:# 1747 #: WT2 IN SD. WT2-WHT LINE FAULT
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09743	101.5287	CROOKSTON - FALCONER 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10375	105.3731	GLENBORO SOUTH - J290_SUB 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09747	101.8029	FT THOMPSON - WESSINGTON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.8	PRAIRIE ISLAND 345/20.0KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100.2042	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0963	99.8	ELM CREEK - PARKERS LAKE 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09744	101.9756	BROOKING COUNTY - LYON COUNTY 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10807	109.1345	P12:345:UMZB:# 108 #: LOS FT IN ND. LOS FT
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10301	108.3885	FORMAN - HANKINSON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09697	99.4	P12:230:UMZB:# 112 #: NU IN SD. NU-RCDC & DRY CREEK XFMR
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.4	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09783	102.073	FT RANDAL - FT THOMPSON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09441	99.7	FRONTER4 230.00 - MAPLE RIVER 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0964	100.0825	AS KING - EAU CLAIRE 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09865	102.1261	HARVEY - UNDERWOOD 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09824	102.2184	PRAIRIE3 345.00 (P2) 345/230/13.8KV TRANSFORMER CKT 2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09717	100.3941	JAMES PK 115/41.6KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09681	99.8	MAPLE R3 345.00 (345/230) 345/230/13.8KV TRANSFORMER CKT 2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.11112	115.4221	CENTER - CNTSHTN3 345.00 345KV CKT 21
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09526	99.9	GRANITE FALLS - MORRIS 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100	AS KING 345/20.0KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09527	99.7	AUDUBON - HUBBARD 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09781	102.0195	FT THOMPSON - LAKE PLATT 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09648	99.8	MAPLE RIVER - WINGER 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09653	99.7	BUFFALO - CS1TNET7 115.00 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09643	100.3666	GRE-WINGRIV4230.00 - INMANN 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1079	109.1216	P12:345:UMZB:# 102 #: AVS BD IN ND. AVS BRD LR
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09763	101.8721	HURON - WATERTOWN 230KV CKT 2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09664	100.2912	ALEXANDRIA - GRE-HUDSON 7115.00 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.7701	JAMES DTN - JAMES TAP 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09859	103.7804	BALTA - RAMSEY 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.4104	LIVERNE4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10375	102.8843	J290_SUB 230.00 - RUGBY 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09763	101.7909	FALCONER - GRAND FORKS 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09767	102.422	FT THOMPSON - LETCHER 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	99.8	PRAIRIE ISLAND 345/20.0KV TRANSFORMER CKT 2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09712	101.7746	MORANVILLE - ROSEAU 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09763	101.8286	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09712	101.7662	RICHER - ROSEAU 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09776	102.6581	P12:230:UMZB:# 116 #: ST IN SD. WSG-ST-VH
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09733	101.5104	P12:115:UMZW:# 168 #: PLL IN ND. FAULT ON LE-PLL-RG 115 KV
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10151	102.7122	P12:230:UMZB:# 117 #: WK IN SD. SB-WK-GH
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0816	101.8724	CENTER - MPC02100TAP4230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.5412	SIBLEY 4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09697	99.4	P13:230:UMZW:# 2218 #: FP IN MT. LOSS OF TRANSFORMER (AT2).
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09681	99.8	MAPLE R3 345.00 (345/230) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 4
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 5
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09653	100.318	MAPLE RIVER TAP NORTH - SHEYNE 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09749	101.5282	P12:115:UMZW:# 185 #: EGI IN ND.
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09712	101.587	LUND - MORANVILLE 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09908	99.7	DRAYTON - LETELIER 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	100	ANSON - SPLIT ROCK 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09174	100.0508	LELAND OLDS - STANTON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.1441	BARNES 4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.7501	BARNES 4 230.00 - SIBLEY 4 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	101.7359	GRAND FORKS - PRAIRIE 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0988	101.9397	BALTA - MCHENRY 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09441	100.1976	FRONTER4 230.00 - WAHPETON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10187	105.3508	PRAIRIE - WINGER 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	102.3879	LIVERNE4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09697	100.9602	JAMESTOWN (345/115) 345/115/41.6KV TRANSFORMER CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09653	99.4	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09814	102.0153	COAL CREEK - MCHENRY 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09697	100.9711	JAMESTOWN (345/115) 345/115/41.6KV TRANSFORMER CKT 2
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09454	99.6	P12:230:UMZW:# 158 #: MH IN ND.
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1079	109.1173	P12:345:UMZB:# 103 #: BD IN SD. LOSS OF LINE
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09707	99.7	ALEXMRES3 345.00 () 345/115/34.5KV TRANSFORMER CKT 9
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09664	100.3133	DOUGLAS CO - GRE-HUDSON 7115.00 115KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09816	106.2754	HANKINSON - WAHPETON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09462	99	AUDUBON - SHEYNE 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09865	102.3124	COAL CREEK - UNDERWOOD 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09675	101.9335	COAL CREEK - UNDERWOOD 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.8	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09528	101.3546	P12:230:UMZW:# 733 #: FT IN SD. FT-BG2 LINE FAULT
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09469	99.4	BUFFALO - CSLTNET7 115.00 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.8	ANSON - SPLIT ROCK 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09675	101.7367	HARVEY - UNDERWOOD 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09516	101.4194	GRAND FORKS - PRAIRIE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09528	101.281	LUND - RUNNING 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09517	99.3	ALEXMRES3 345.00 () 345/115/34.5KV TRANSFORMER CKT 9
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08099	102.2849	CENTER - MPC02100TAP4230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.6	PRAIRIE ISLAND 345/20.0KV TRANSFORMER CKT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09568	101.2536	HURON - WATERTOWN 230KV CKT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09482	99.9	DOUGLAS CO - GRE-HUDSON 7115.00 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	100.7745	SHEYNE SVC - SHEYNE 115KV CKT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09674	103.7588	BALTA - RAMSEY 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	106.3539	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0936	99.9	GRANITE FALLS - MORRIS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09582	101.9089	P12:230:UMZB:# 116 #: ST IN SD. WSG-ST-VH
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.4717	BARNES 4 230.00 - SIBLEY 4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09597	102.4241	BROOKING COUNTY - LYON COUNTY 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09645	102.6181	PRAIRIE - RAMSEY 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.8	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 5
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09463	99.8	AS KING - EAU CLAIRE 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09549	101.1194	P12:115:UMZW:# 168 #: PLL IN ND. FAULT ON LE-PLL-RG 115 KV
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09932	101.9401	P12:230:UMZB:# 117 #: WK IN SD. SB-WK-GH
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09564	101.286	APPLEDORN 4 230.00 - WATERTOWN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.8	AS KING 345/20.0KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.5	P13:230:UMZW:# 2218 #: FP IN MT. LOSS OF TRANSFORMER (AT2).
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09654	104.5093	FORMAN - OAKES 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0969	101.5473	BALTA - MCHENRY 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09514	99.3	P12:230:UMZB:# 112 #: NU IN SD. NU-RCDC & DRY CREEK XFMR
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09556	101.3686	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09488	99.3	MAPLE R3 345.00 (345/230) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09528	101.4568	MORANVILLE - ROSEAU 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1016	105.5696	GLENBORO SOUTH - J290 SUB 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09482	99.9	ALEXANDRIA - GRE-HUDSON 7115.00 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.9	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09675	101.6397	BALTA - HARVEY 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	106.3912	P12:345:UMZB:# 103 #: BD IN SD. LOSS OF LINE
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09274	99.5	P12:230:UMZW:# 156 #: MDOE IN MN. LINE FAULT CAUSES LOSS OF MH 230KV BUS
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09462	104.8123	HANKINSON - WAHPETON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09187	99.6	FRONTERA 230.00 - WAHPETON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09574	101.7157	FT THOMPSON - LETCHER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.8	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09352	99.4	AUDUBON - HUBBARD 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09469	99.8	CSLTNET7 115.00 - MAPLE RIVER TAP NORTH 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10339	105.9414	FARGO - SHEYNE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.8	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.2612	SIBLEY 4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09528	101.3163	LUND - MORANVILLE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09485	99.4	MAPLE RIVER - WINGER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0977	103.2861	BSSOUTH3 345.00 - ELLENDLMVP3 345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09992	104.8561	PRAIRIE - WINGER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09488	99.3	MAPLE R3 345.00 (345/230) 345/230/13.8KV TRANSFORMER CKT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.8	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 4
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	102.2657	LUVERNE4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.8	ANSON (ANS 1) 115/13.8/13.8KV TRANSFORMER CKT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09564	101.2254	APPLEDORN 4 230.00 - GRANITE FALLS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09566	101.1677	P12:115:UMZW:# 185 #: EGI IN ND.
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09523	101.331	BIG STONE (230/115) 230/115/13.8KV TRANSFORMER CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEA (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09514	100.6825	JAMESTOWN (345/115) 345/115/41.6KV TRANSFORMER CKT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.432	JAMES DTN - JAMES TAP 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09577	101.4193	FALCONER - GRAND FORKS 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09449	99.6	ELM CREEK - PARKERS LAKE 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09625	101.6759	COAL CREEK - MCHENRY 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09733	104.7031	CHISAGO COUNTY - FORBES 500KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09708	99.9	DRAYTON - LETELLIER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	103.5928	MAPLE RIVER - PILSBRY4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09733	104.5788	CHISAGO COUNTY - CHISAGO COUNTY 500KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10592	106.1073	P12:345:UMZB:# 108 #: LOS FT IN ND. LOS FT
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	103.3624	SHERBURNE CO 345/24.0KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09588	101.3831	FT RANDAL - FT THOMPSON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09559	101.1703	CROOKSTON - FALCONER 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09469	100	MAPLE RIVER TAP NORTH - SHEYNE 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09469	99	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09187	99	FRONTER4 230.00 - MAPLE RIVER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.1016	102.1693	J290_SUB 230.00 - RUGBY 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09557	101.2179	FT THOMPSON - WESSINGTON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08979	99.6	LELAND OLDS - STANTON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09274	99.5	P12:230:UMZW:# 158 #: MH IN ND.
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09312	99.8	SQUARE BUTTE - STANTON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09568	101.2238	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	101.6581	BARNES 4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0961	103.7566	ELLENDLMP4 230.00 - OAKES 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09586	101.3712	FT THOMPSON - LAKE PLATT 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	99.6	PRAIRIE ISLAND 345/20.0KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09528	101.4917	RICHER - ROSEAU 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08099	105.3503	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09514	100.6548	JAMESTOWN (345/115) 345/115/41.6KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10883	115.1688	CNTSHNT3 345.00 - PRAIRIE3 345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09932	101.9401	P12:230:UMZB:# 114 #: SB IN SD. SB-WK-GH
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10565	106.3914	P12:345:UMZB:# 102 #: AVS BD IN ND. AVS BRD LR
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09637	101.8245	PRAIRIE3 345.00 (P2) 345/230/13.8KV TRANSFORMER CKT 2
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0978	102.1906	P12:345:UMZW:# 1747 #: WT2 IN SD. WT2-WHT LINE FAULT
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	102.2643	LUVERNE4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10628	107.7044	P12:345:UMZB:# 109 #: LOS GRT IN ND. LOS GRT
16ALL	20SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0973	103.8535	FORMAN - HANKINSON 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10022	106.4532	RIEL - ROSEAU 500KV CKT 1
16ALL	20WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10663	108.3322	CNTSHNT3 345.00 - PRAIRIE3 345.00 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10022	106.4446	ROSEAU - ROSEAU 2 500.00 500KV CKT 1
16ALL	20WP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	717	717	0.10022	106.4446	ROSEAU - ROSEAU 2 500.00 500KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09459	106.0961	ELM CREEK - MONTICELLO 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09294	106.7234	P12:230:UMZW:# 158 #: MH IN ND.
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	110.6929	SHERBURNE CO 345/24.0KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	109.1712	BALTA - HARVEY 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.2913	BARNES 4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08996	107.1223	LELAND OLDS - STANTON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0995	109.4545	P12:230:UMZB:# 114 #: SB IN SD. SB-WK-GH
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09578	108.4653	CROOKSTON - FALCONER 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09584	108.4758	P12:115:UMZW:# 185 #: EGI IN ND.
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.7487	CLAY BOSWELL 230/20.9KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09603	109.2693	P12:230:UMZB:# 116 #: ST IN SD. WSG-ST-VH
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08498	100.913	CENTER - COYOTE 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09502	107.2	DOUGLAS CO - GRE-HUDSON 7115.00 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.741	LUVERNE4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09588	108.5737	HURON - WATERTOWN 230KV CKT 2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09509	106.4707	MAPLE R3 345.00 (345/230) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09469	106.8605	ELM CREEK - PARKERS LAKE 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.9214	BARNES 4 230.00 - SIBLEY 4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09371	106.6395	AUDUBON - HUBBARD 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09513	106.4911	MAPLE RIVER - WINGER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.9641	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10612	113.1128	P12:345:UMZB:# 108 #: LOS FT IN ND. LOS FT
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.211	G830 SUB 115.00 - GRE-MCHENRY7115.00 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09617	109.8645	BROOKING COUNTY - LYON COUNTY 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09791	110.2797	BSSOUTH3 345.00 - ELLENDLMP3 345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09698	105.6407	MAPLE RIVER - SHEYNE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0931	105.5114	CENTER (C1) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	107.9898	JAMESTOWN (345/115) 345/115/41.6KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	109.287	HARVEY - UNDERWOOD 230KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09606	108.6852	FT THOMPSON - LAKE PLATT 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09673	111.7752	FORMAN - OAKES 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09534	107.8011	JAMES PK - JAMES TAP 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.6352	P13:230:UMZW:# 2218 #: FP IN MT. LOSS OF TRANSFORMER (AT2).
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10585	113.6241	P12:345:UMZB:# 102 #: AVS BD IN ND. AVS BRD LR
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10649	114.7416	P12:345:UMZB:# 109 #: LOS GRT IN ND. LOS GRT
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0975	111.3244	FORMAN - HANKINSON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.7764	PRAIRIE ISLAND 345/20.0KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09306	105.6653	AUDUBON - SHEYNE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	107.0043	AS KING 345/20.0KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09645	109.2197	COAL CREEK - MCHENRY 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.026	RGBYWND4 230.00 - RUGBY 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09489	107.1694	MAPLE RIVER TAP NORTH - SHEYNE 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.7782	JAMES DTN - JAMES TAP 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	109.4978	COAL CREEK - UNDERWOOD 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.5398	SIBLEY 4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09958	112.061	PRAIRIE - WINGER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09584	108.5946	APPLEDORN 4 230.00 - WATERTOWN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0931	105.5114	CENTER (C2) 345/230/13.8KV TRANSFORMER CKT 2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09549	108.8357	P12:230:UMZW:# 733 #: FT IN SD. FT-BG2 LINE FAULT
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10183	110.2711	J290_SUB 230.00 - RUGBY 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10585	113.5804	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08254	103.0079	ALEXMRES3 345.00 - WAITE PARK 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09712	109.087	BALTA - MCHENRY 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09482	107.0471	AS KING - EAU CLAIRE 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.9687	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 5
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09595	109.0528	FT THOMPSON - LETCHER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.196	J290_SUB 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09608	108.707	FT RANDAL - FT THOMPSON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	100.9512	LADISH 115/13.2KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	104.6884	MPC02100TAP4230.00 - MPC2100WIND4230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	109.7591	LUVERNE4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09538	108.6367	GRAND FORKS - PRAIRIE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.9947	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09657	109.2284	PRAIRIE3 345.00 (P2) 345/230/13.8KV TRANSFORMER CKT 2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09576	108.6932	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10913	123.3574	CNTSHNT3 345.00 - PRAIRIE3 345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	103.2334	BISONMP4 230.00 - SQUARE BUTTE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09577	108.5397	FT THOMPSON - WESSINGTON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.7783	PRAIRIE ISLAND 345/20.0KV TRANSFORMER CKT 2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08116	103.7353	CENTER - SQUARE BUTTE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	111.3461	MAPLE RIVER - PILSBRY4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0995	109.4545	P12:230:UMZB:# 117 #: WK IN SD. SB-WK-GH
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09489	106.9857	CSLTNET7 115.00 - MAPLE RIVER TAP NORTH 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09502	107.1	ALEXANDRIA - GRE-HUDSON 7115.00 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09547	108.7453	MORANVILLE - ROSEAU 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09534	106.4662	P12:230:UMZB:# 112 #: NU IN SD. NU-RCDC & DRY CREEK XFMR
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10353	113.1094	FARGO - SHEYNE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10183	113.4106	GLENBORO SOUTH - J290_SUB 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.9947	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.0963	110.9966	ELLENLMPV4 230.00 - OAKES 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.0094	RGBYWND4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09482	112.2058	HANKINSON - WAHPETON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	99.9	CENTER 230/22.0KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09206	106.8872	FRONTER4 230.00 - WAHPETON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09294	106.7234	P12:230:UMZB:# 156 #: MDOE IN MN. LINE FAULT CAUSES LOSS OF MH 230KV BUS
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09608	108.8091	FALCONER - GRAND FORKS 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09666	110.0872	PRAIRIE - RAMSEY 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09543	108.6822	BIG STONE (230/115) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	106.9687	BISONMP4 230.00 230/34.5KV TRANSFORMER CKT 4
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09696	110.8466	BALTA - RAMSEY 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09489	106.5604	BUFFALO - CSLTNET7 115.00 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	104.6869	MPC2100WIND4230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09801	109.567	P12:345:UMZB:# 1747 #: WT2 IN SD. WT2-WHT LINE FAULT
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.8093	SQUARE BUTTE 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09537	106.5239	ALEXMRES3 345.00 (I) 345/115/34.5KV TRANSFORMER CKT 9
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	108.0087	JAMESTOWN (345/115) 345/115/41.6KV TRANSFORMER CKT 2
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09329	108.6221	SQUARE BUTTE - STANTON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.10585	113.6235	P12:345:UMZB:# 103 #: BD IN SD. LOSS OF LINE
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09509	106.4562	MAPLE R3 345.00 (345/230) 345/230/13.8KV TRANSFORMER CKT 2

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08116	114.0222	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.08116	110.9024	CENTER - MPC02100TAP4230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09489	106.1715	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09588	108.5405	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09206	106.1152	FRONTER4 230.00 - MAPLE RIVER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	BUFFALO - JAMESTOWN 345KV CKT 1	705	705	0.09533	105.2082	G830 SUB 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1	187	223	0.03108	110.3328	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1	187	223	0.03108	115.6918	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1	187	223	0.03128	106.8764	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1	187	223	0.03128	111.1895	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	20SP	G15_096	FROM->TO	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1	187	223	0.03103	118.0196	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	20SP	G15_096	FROM->TO	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1	187	223	0.03103	113.1038	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	20WP	G15_096	FROM->TO	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1	187	223	0.03037	108.8794	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	20WP	G15_096	FROM->TO	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1	187	223	0.03037	114.5282	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	25SP	G15_096	FROM->TO	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1	187	223	0.03107	124.4323	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	25SP	G15_096	FROM->TO	BUFFALO (BUFFALO3) 345/115/41.6KV TRANSFORMER CKT 1	187	223	0.03107	118.3408	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	16WP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	351	0.0472	134.6315	ELLENDALE - MERRCRT4 230.00 230KV CKT 1
16ALL	17G	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03181	99.4	LELANDOLDS - GROTON-TLINE-REACTORS-CKT1
16ALL	17G	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.047	137.6832	ELLENDALE - MERRCRT4 230.00 230KV CKT 1
16ALL	17G	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03181	99.4	GROTON - GROTON-LNX3 345.00 345KV CKT Z
16ALL	17G	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03181	99.4	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	17G	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03181	99.6	GROTON-LNX3 345.00 - LELAND1-LNX3345.00 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03013	99.1	FT THOMPSON - FTTHOM1-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03247	103.0933	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.0309	102.7767	BRDLAND-LNX3345.00 - HURON 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03013	101.9597	LELAND OLDS - LELAND2-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.0309	102.9291	ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.0309	100.1197	ANTELOP-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.0309	102.7739	BROADLAND - HURON 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.0309	102.7731	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.04794	143.6378	ELLENDALE - MERRCRT4 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03013	102.2394	FTTHOMPSON-LELANDOLDS-TLINE-REACTORS-CKT1
16ALL	17G	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.02953	99.2	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	17G	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03144	100.6468	CENTER - JAMESTOWN 345KV CKT 1
16ALL	17G	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03181	99.4	P12:345:UMZB:# 109 #: LOS GRT IN ND. LOS GRT
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.0309	102.9291	P12:345:UMZB:# 102 #: AVS BD IN ND. AVS BRD LR
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.0309	102.7731	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03013	102.2394	P12:345:UMZB:# 108 #: LOS FT IN ND. LOS FT
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.03166	99.2	CENTER - SQUARE BUTTE 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - J316_SUB 230.00 230KV CKT 1	319	343	0.0309	102.9252	P12:345:UMZB:# 103 #: BD IN SD. LOSS OF LINE
16ALL	16WP	G15_096	TO->FROM	ELLENDALE - MERRCRT4 230.00 230KV CKT 1	319	398	0.04643	114.1047	ELLENDALE - J316_SUB 230.00 230KV CKT 1
16ALL	17G	G15_096	TO->FROM	ELLENDALE - MERRCRT4 230.00 230KV CKT 1	319	383	0.04622	118.7325	ELLENDALE - J316_SUB 230.00 230KV CKT 1
16ALL	17SP	G15_096	TO->FROM	ELLENDALE - MERRCRT4 230.00 230KV CKT 1	319	383	0.04715	124.0095	ELLENDALE - J316_SUB 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03759	104.3062	BISMARCK - HILKEN 4 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04016	108.085	GLENHAM - L3 HAWDON 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03982	108.1709	GRANDPRAIRIE-FTTHOMPSON-TLINE-REACTORS-CKT1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03666	105.1776	G13_0011ST 115.00 - SUMMIT 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04166	108.5831	BISMARCK - GRANTEE FALLS 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03982	108.7453	GRPRARI-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	103.9233	GEN659407 1-ANTELPHILLSW0.6900
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	107.3738	GEN600003 1-PRAIRIE ISLAND G1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03982	108.745	GRANDPRAIRIE-HOLT-TLINE-REACTOR-CKT1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04015	107.387	GLENHAM - WHITLOK 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.7025	GEN563342 1-G15098_3 0.6900
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.8258	GEN652460 4-GARRISON
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04465	101.9731	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	101.4974	GEN659103 1-ANTELOPE VALLEY UNIT1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.0057	GEN659141 1-K10215A
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03839	107.8489	CARPENTER - HURON 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04116	110.1267	ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03852	110.2225	ABERDEEN SIEBRECHT - GROTON 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03585	102.9368	ELLENDALE - MERRCRT4 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03527	102.0398	J316_SUB 230.00 - TATANKA 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03856	107.5237	BRISTOL - GROTON 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.8311	GEN652461 5-GARRISON
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	103.7695	GEN659110 1-LELAND OLDS UNIT1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	99.4	GEN661015 1-COYOTE
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04116	110.0919	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04147	109.7224	FTTHOMPSON-LELANDOLDS-TLINE-REACTORS-CKT1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03991	109.9384	BISMARCK - JAMES TOWN 230KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	107.371	GEN600004 2-PRAIRIE ISLAND G2
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.0053	GEN659453 1-G11414GEN W0.6900
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03962	109.354	JAMES TOWN - VALLEY CITY 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03547	103.6875	MBPP1 - SUMMIT 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	107.513	GEN600006 1-AS KING
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03982	109.2721	GR ISLD-LNX3345.00 - GRAND ISLAND 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03982	108.7785	GRPRAR1-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04493	117.5078	ABERDEEN JCT - ABERDEEN SIEBRECHT 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03839	107.6888	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04559	115.0208	G09_0011ST 345.00 - GROTON 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03766	99.3	FORMAN - FORMAN OTP 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	108.893	GEN600002 3-SHERBURNE CNTY G3
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03982	109.289	GR ISLD-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04327	107.9273	BISON - HETINGER 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03913	107.4558	WATERTN-LNX3345.00 - WATERTOWN 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.4726	GEN659366 3-WILTON 3 W0.6900
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04147	109.7844	FTTHOMPSON-LELANDOLDS-TLINE-REACTOR-CKT1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03982	108.1784	FT THOMPSON - FTTHOM2-LNX3345.00 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04147	109.899	FTTHOM1-LNX3345.00 - LELAND2-LNX3345.00 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.8265	GEN 10648 1-G830_GEN 0.6900
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03856	107.2299	BRISTOL - SUMMIT 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	116.9034	BASE CASE
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03899	108.8733	GARRISON - JAMES TOWN 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	101.4539	GEN657749 1-YOUNG 1 GENERATOR
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	100.9493	GEN659125 1-COVEY
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	108.4547	GEN600001 2-SHERBURNE CNTY G2
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.8185	GEN652458 2-GARRISON
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04116	109.9993	ANTELOP-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03527	99.1	ELLENDALE - J316_SUB 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03906	107.7953	ABERDEEN SIEBRECHT - REDFIELD 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03991	110.0924	BISMARCK - WEBER 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04493	125.7483	ELLENDALE (ELLENDL TR1) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03821	107.3382	HANLON - STORLA 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.2671	GEN657745 1-MPC02100GEN90.6900
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03991	109.86	JAMES TOWN - WEBER 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.801	GEN660001 2-ABERDEEN SIEBRECHT
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03913	107.4515	WATERTOWN-WHITE-TLINE-REACTOR-CKT1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03547	103.6625	FORMAN - MBPP1 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	103.9764	GEN563302 1-G15096_3 0.6900
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04147	109.667	FT THOMPSON - FTTHOM1-LNX3345.00 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03913	107.6308	WATERTN-LNX3345.00 - WHITE 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	101.4974	GEN659107 2-ANTELOPE VALLEY UNIT2
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03839	107.7501	HURON - WATERTOWN 230KV CKT 2
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	103.074	GEN615010 1-STANTON4
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03962	105.0755	ELLIOTT7 115.00 - FORMAN 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.0227	GEN659403 1-NDSunFLWR W0.6900
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04116	110.0924	BRDLAND-LNX3345.00 - HURON 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04116	110.0921	BROADLAND - HURON 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03982	108.2662	FTTHOM2-LNX3345.00 - GRPRAR2-LNX3345.00 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03982	108.125	GRPRAR2-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03982	108.1796	FTTHOMPSON-GRANDPRAIRIE-TLINE-REACTOR-CKT1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04493	122.3575	ABERDEEN JCT - ELLENDALE 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03995	110.1306	GROTON - GROTON-LNX3 345.00 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04166	109.2716	GRANTE FALLS - MANDAN 4 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	108.0388	GEN600005 1-MONTICELLO
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.8185	GEN652457 1-GARRISON
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	108.3759	GEN600000 1-SHERBURNECNTY G1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04016	107.5888	BISMARCK - L3 HAWDON 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03891	108.0071	FARGO - JAMES TOWN 230KV CKT 2
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03723	104.6915	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	101.6365	GEN659111 2-LELAND OLDS UNIT2
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	101.9913	GEN562872 1-G15046_3 0.6900
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04116	110.5255	ANTELOP-LNX3345.00 - BRDLAND-LNX3345.00 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03995	110.4452	GROTON-LNX3 345.00 - LELAND1-LNX3345.00 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.8185	GEN652459 3-GARRISON
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03995	110.1027	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	115.4059	GEN620315 1-BIG STONE GEN
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04559	115.854	G09_0011ST 345.00 - WATERTOWN 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03894	108.0598	FARGO - JAMES TOWN 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03666	104.7453	G13_0011ST 115.00 - WATERTOWN 115KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04147	109.6482	LELAND OLDS - LELAND2-LNX3345.00 345KV CKT Z
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03995	110.1383	LELANDOLDS-GROTON-TLINE-REACTORS-CKT1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.4675	GEN659010 4-G07_027IS 2 0.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03594	102.1643	J316_SUB 230.00 - TATANKA 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	110.4666	LELANDOLDS-GROTON-TLINE-REACTORS-CKT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04053	108.9347	GRPRAR1-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04025	108.8803	JAMES TOWN - VALLEY CITY 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03909	107.7077	HURON - WATERTOWN 230KV CKT 2
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04053	108.4894	FTTHOM2-LNX3345.00 - GRPRAR2-LNX3345.00 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	101.4204	GEN659103 1-ANTELOPE VALLEY UNIT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04507	124.0074	ABERDEEN JCT - ELLENDALE 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04392	108.3283	BISON - MAURINE 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	101.4204	GEN659107 2-ANTELOPE VALLEY UNIT2
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	100	GEN661015 1-COYOTE
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	105.0168	GEN652459 3-GARRISON
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04053	108.3054	FT THOMPSON - FTTHOM2-LNX3345.00 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04058	109.8909	JAMES TOWN - WEBER 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03835	100	FORMAN - FORMAN OTP 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04538	102.1759	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	99.1	GEN657748 1-YOUNG 2 GENERATOR
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.6726	GEN659010 4-G07_027IS 2 0.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04178	110.6219	BROADLAND - HURON 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	110.8826	GROTON-LNX3 345.00 - LELAND1-LNX3345.00 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	108.5674	GEN600001 2-SHERBURNE CNTY G2
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	115.2824	GEN620315 1-BIG STONE GEN
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0423	108.8129	BISMARCK - GRANTE FALLS 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04074	108.5308	SULLYBT-LNX3230.00 - WHITLOK 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0463	115.9177	G09_0011ST 345.00 - GROTON 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	105.0168	GEN652457 1-GARRISON
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	105.0392	GEN 10648 1-G830_GEN 0.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04053	108.9346	GRANDPRAIRIE-HOLT-TLINE-REACTOR-CKT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03617	103.2272	FORMAN - MBPP1 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03826	104.3525	BISMARCK - HILKEN 4 230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03866	105.3054	BLAIR - WATERTOWN 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04053	109.3932	GR ISLD-LNX3345.00 - GRAND ISLAND 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	109.949	BISMARCK - JAMES TOWN 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0398	107.7527	WATERTOWN-WHITE-TLINE-REACTOR-CKT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	103.8575	GEN659110 1-LELAND OLDS UNIT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03962	110.3309	ABERDEEN SIEBRECHT - GROTON 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04053	108.9633	GRPRAR1-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	105.0289	GEN652460 4-GARRISON
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.2883	GEN659141 1-K10215A
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04207	110.8659	FTTHOM1-LNX3345.00 - LELAND2-LNX3345.00 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04058	109.9158	BISMARCK - WEBER 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04178	110.4424	ANTELOP-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.1434	GEN563302 1-G15096 3 0.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	107.5804	GEN600004 2-PRAIRIE ISLAND G2
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04178	111.1783	ANTELOP-LNX3345.00 - BRDLAND-LNX3345.00 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04507	121.8081	ABERDEEN JCT - ABERDEEN SIEBRECHT 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04053	109.3613	GR ISLD-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03979	107.726	FARGO - SHEYNE 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	110.4586	GROTON - GROTON-LNX3 345.00 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0423	109.2524	GRANTE FALLS - MANDAN 4 230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	110.4317	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	105.0293	GEN652461 5-GARRISON
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04074	108.4126	OAHE - SULLY BUTTE 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03909	107.661	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.437	GEN657745 1-MPC02100GEN90.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0398	107.9007	WATERTN-LNX3345.00 - WHITE 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04075	108.687	BISMARCK - L3 HAWDON 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04207	110.6117	LELAND OLDS - LELAND2-LNX3345.00 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04392	108.4843	BISON - HETINGER 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	103.2588	GEN615010 1-STANTON4
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03961	108.4074	FARGO - JAMES TOWN 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	107.6702	GEN600006 1-AS KING
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04178	110.674	ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03965	109.0905	GARRISON - JAMES TOWN 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	108.444	GEN600000 1-SHERBURNECNTY G1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03975	107.9917	ABERDEEN SIEBRECHT - REDFIELD 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	101.5156	GEN659111 2-LELAND OLDS UNIT2

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEA (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	101.0361	GEN659125 1-COVEY
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.8849	GEN563342 1-G15098 3 0.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03617	103.2398	MBPP1 - SUMMIT 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	107.5827	GEN600003 1-PRAIRIE ISLAND G1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.6753	GEN659366 3-WILTON 3 W0.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03732	104.6296	G13_0011ST 115.00 - WATERTOWN 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	102.0673	GEN657749 1-YOUNG 1 GENERATOR
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	108.9788	GEN600002 3-SHERBURNE CNTY G3
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	105.0168	GEN652458 2-GARRISON
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04207	110.6186	FT THOMPSON - FTTHOM1-LNX3345.00 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.2232	GEN659403 1-NDSUNFLWR W0.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.1708	GEN659453 1-G11414GEN W0.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03957	108.3524	FARGO - JAMES TOWN 230KV CKT 2
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03924	107.521	BRISTOL - GROTON 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	117.0809	BASE CASE
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0398	107.7522	WATERTN-LNX3345.00 - WATERTOWN 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03594	99.5	ELLENDALE - J316 SUB 230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04053	108.3064	FTTHOMPSON-GRANDPRAIRIE-TLINE-REACTOR-CKT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04053	108.3115	GRANDPRAIRIE-FTTHOMPSON-TLINE-REACTORS-CKT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04074	108.5308	SULLYBUTTE-WHITLOCK-TLINE-REACTOR-CKT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04075	109.2026	GLENHAM - L3 HAWDON 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04207	110.6842	FTTHOMPSON-LELANDOLDS-TLINE-REACTORS-CKT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03975	107.7034	REDFIELD - WEST PARK B TAP 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04074	108.6322	GLENHAM - WHITLCK 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04074	108.5627	SULLEY BUTTE - SULLYBT-LNX3230.00 230KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	108.1843	GEN600005 1-MONTICELLO
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04178	110.6226	BRDLAND-LNX3345.00 - HURON 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04207	110.7568	FTTHOMPSON-LELANDOLDS-TLINE-REACTOR-CKT1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03786	104.7581	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04507	125.8489	ELLENDALE (ELLEND TR1) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04178	110.6216	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03732	105.0298	G13_0011ST 115.00 - SUMMIT 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03652	103.0932	ELLENDALE - MERRCRT4 230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	102.1489	GEN562872 1-G15046 3 0.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03909	107.7648	CARPENTER - HURON 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.071	GEN659407 1-ANTELPHILLSW0.6900
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04053	108.3596	GRPRAR-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0463	116.8815	G09_0011ST 345.00 - WATERTOWN 345KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03912	114.1891	CARPENTER - HURON 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04085	114.2982	SULLYBUTTE-WHITLOCK-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	110.0492	GEN659403 1-NDSUNFLWR W0.6900
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	109.7789	GEN659407 1-ANTELPHILLSW0.6900
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	106.5328	GEN659107 2-ANTELOPE VALLEY UNIT2
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03977	114.6161	ABERDEEN SIEBRECHT - REDFIELD 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	106.1167	GEN661015 1-COYOTE
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03826	110.4538	BISMARCK - HILKEN 4 230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	115.9879	GRPRAR1-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03912	114.126	HURON - WATERTOWN 230KV CKT 2
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03892	114.0077	HANLON - STORLA 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	106.8765	GEN659111 2-LELAND OLDS UNIT2
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03652	108.9514	ELLENDALE - MERRCRT4 230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	114.9785	GEN600001 2-SHERBURNE CNTY G2
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03977	113.7614	REDFIELD - WEST PARK B TAP 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04065	116.075	BISMARCK - JAMES TOWN 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04085	114.1583	OAHE - SULLEY BUTTE 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	106.5328	GEN659103 1-ANTELOPE VALLEY UNIT1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	109.9864	GEN659141 1-K10215A
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04085	114.2982	SULLYBT-LNX3230.00 - WHITLCK 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04036	115.2702	JAMES TOWN - VALLEY CITY 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03963	114.7736	FARGO - JAMES TOWN 230KV CKT 2
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03928	113.9481	BRISTOL - SUMMIT 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	102.9829	GEN615002 2-COAL CREEK
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	105.267	GEN657748 1-YOUNG 2 GENERATOR
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04086	114.7223	BISMARCK - L3 HAWDON 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	109.902	GEN563302 1-G15096 3 0.6900
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04065	116.2338	JAMES TOWN - WEBER 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	114.7814	GEN600000 1-SHERBURNECNTY G1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	109.9334	GEN659453 1-G11414GEN W0.6900
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03593	105.2782	ELLENDALE - J316 SUB 230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	122.1542	GEN620315 1-BIG STONE GEN

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03614	109.2858	MBPPI - SUMMIT 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04222	116.4734	FT THOMPSON - FTTHOM1-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03986	113.9897	WATERTN-LNX3345.00 - WATERTOWN 345KV CKT Z
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03734	110.252	G13_0011ST 115.00 - WATERTOWN 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	110.5101	GEN659366 3-WILTON 3 W0.6900
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	109.4777	GEN659110 1-LELAND OLDS UNIT1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	115.9879	GRANDPRAIRIE-HOLT-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	110.5019	GEN659010 4-G07_027IS_2 0.6900
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	103.1405	GEN615001 1-COAL CREEK
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03928	114.1422	BRISTOL - GROTON 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	114.4427	GEN600005 1-MONTICELLO
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04085	114.3423	SULLEY BUTTE - SULLYBT-LNX3230.00 230KV CKT Z
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04231	114.819	BISMARCK - GRANTE FALLS 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03883	114.2408	GROTON (GROTON KU2A) 345/115/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	110.3035	GEN657745 1-MPC02100GEN90.6900
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04401	115.3632	BISON - HETINGER 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04543	108.8651	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03734	110.6482	G13_0011ST 115.00 - SUMMIT 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	123.7136	BASE CASE
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03791	110.6047	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04568	123.1962	ABERDEEN JCT - ABERDEEN SIEBRECHT 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04568	129.808	ABERDEEN JCT - ELLENDALE 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04231	115.5327	GRANTE FALLS - MANDAN 4 230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03986	113.9841	WATERTOWN-WHITE-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03967	114.8408	FARGO - JAMES TOWN 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03593	108.0366	J316_SUB 230.00 - TATANKA 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	116.8748	FTTHOMPSON-GRANDPRAIRIE-TLINE-REACTOR-CKT1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03881	113.9919	FT THOMPSON - LETCHER 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	115.9828	GRPRAR1-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	110.6022	GEN660001 2-ABERDEEN SIEBRECHT
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0419	116.3047	ANTELOP-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	115.4441	GEN600002 3-SHERBURNE CNTY G3
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04086	115.369	GLENHAM - L3 HAWDON 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03614	109.2706	FORMAN - MBPPI 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	116.7019	GRPRAR2-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	109.0489	GEN615010 1-STANTON4
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	106.588	GEN659125 1-COVEY
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	107.6941	GEN562872 1-G15046 3 0.6900
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04068	115.9024	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	115.7309	FT THOMPSON - FTTHOM2-LNX3345.00 345KV CKT Z
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03839	106.5423	FORMAN - FORMAN OTP 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04085	114.4462	GLENHAM - WHITLOK 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	108.163	GEN657749 1-YOUNG 1 GENERATOR
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04401	115.1941	BISON - MAURINE 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04065	116.3344	BISMARCK - WEBER 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04568	132.0016	ELLENDALE (ELLENL TR1) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	116.8748	GRANDPRAIRIE-FTTHOMPSON-TLINE-REACTORS-CKT1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03974	115.3121	GARRISON - JAMES TOWN 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03927	115.4474	ABERDEEN SIEBRECHT - GROTON 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03912	114.0733	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03985	114.1748	FARGO - SHEYNE 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03745	103.9927	BIG STONE (230/115) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03906	107.7953	ABERDEEN SIEBRECHT - REDFIELD 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	103.8534	LANGDON - LANGWIN7 115.00 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03596	102.9426	HENNING - INMANN 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04465	104.5865	CENTER - MPC02100TAP4230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	114.7696	BIG STONE 230/24.0KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03913	107.4515	P12:345:UMZW:# 1747 #: WT2 IN SD. WT2-WHT LINE FAULT
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03995	110.1383	P12:345:UMZB:# 109 #: LOS GRT IN ND. LOS GRT
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03723	104.6915	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03185	107.2578	BROWNS VALLEY - HANKINSON 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	102.5711	MAPLE RIVER - PILSBRY4 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04465	101.9731	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04676	119.0879	CENTER - JAMESTOWN 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03769	105.0654	BIG STONE - HIGHWAY 12 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	105.1449	FORMAN OTP - GWINNER 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03959	108.0737	J290_SUB 230.00 - RUGBY 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.043	117.5777	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03959	109.5942	GLENBORO SOUTH - J290 SUB 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04493	122.1448	P12:115:UMZZ:# 232 #: AB IN SD. ABERDEEN A TAP BETWEEN ELLENDALE AND ABERDEEN-SIEBRECHT.

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.5832	G830_SUB 115.00 - GRE-MCHENRY7115.00 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.7396	BARNES 4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	105.3927	BARNES 4 230.00 - SIBLEY 4 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	102.0917	RGBYWN4 230.00 - RUGBY 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	103.8886	BARNES 4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03596	102.2786	FERGSFL4 230.00 - GRE-SILVRLK4230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.7749	J290_SUB 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04116	110.0919	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03769	105.2197	HIGHWAY 12 - ORTONVILLE 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	102.5817	MPC2100WIND4230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03997	112.4262	CNTSHNT3 345.00 - PRAIRIE3 345.00 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03839	107.6888	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	102.5853	MPC02100TAP4230.00 - MPC2100WIND4230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03842	107.3888	CENTER - COYOTE 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04147	109.7224	P12:345:UMZB:# 108 #: LOS FT IN ND. LOS FT
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.9899	LUVERNE4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	109.9823	FRONTER4 230.00 - MAPLE RIVER 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03775	107.7275	ALEXMRES3 345.00 () 345/115/34.5KV TRANSFORMER CKT 9
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	107.8995	SHERBURNE CO 345/24.0KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03825	108.2551	BALTA - RAMSEY 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	102.0806	RGBYWN4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.5808	G830_SUB 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03596	102.5722	GRE-SILVRLK4230.00 - HENNING 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.9713	LUVERNE4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	105.7911	HOOT LAKE 115/13.8KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03639	104.3329	GRE-WINGRIV4230.00 - INMANN 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03796	109.4313	BISON 3 345.00 - MAPLE R3 345.00 345KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.0009	J262_J263 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.0009	J262_J263 115.00 115/34.5KV TRANSFORMER CKT 2
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	107.1145	WILTON (WILTON) 115/69/41.6KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	102.2187	BISONMPP4 230.00 - SQUARE BUTTE 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	107.6698	FRONTER4 230.00 - WAHPETON 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03839	107.7501	HURON - WATERTOWN 230KV CKT 2
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03468	100.3434	FERGSFL4 230.00 - WAHPETON 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04116	110.1267	P12:345:UMZB:# 102 #: AVS BD IN ND. AVS BRD LR
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04116	110.1262	P12:345:UMZB:# 103 #: BD IN SD. LOSS OF LINE
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03766	99.3	FORMAN - FORMAN OTP 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04465	111.8037	CENTER - SQUARE BUTTE 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	106.1534	FORMAN 115KV SWITCHED SHUNT
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	101.853	J262_J263 115.00 - JAMESTOWN 115KV CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	104.4255	LANGWIN7 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0378	106.2455	2544-FORMAN
16ALL	16WP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03873	107.369	PRAIRIE - WINGER 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04507	123.9148	P12:115:UMZZ:# 232 #: AB IN SD. ABERDEEN A TAP BETWEEN ELLENDALE AND ABERDEEN-SIEBRECHT.
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03909	107.7077	HURON - WATERTOWN 230KV CKT 2
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03656	102.8245	HENNING - INMANN 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	106.4068	2544-FORMAN
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03975	107.9917	ABERDEEN SIEBRECHT - REDFIELD 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.0398	107.7527	P12:345:UMZW:# 1747 #: WT2 IN SD. WT2-WHT LINE FAULT
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.8163	G830_SUB 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04747	120.6435	CENTER - JAMESTOWN 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	102.1362	J262_J263 115.00 - JAMESTOWN 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.818	G830_SUB 115.00 - GRE-MCHENRY7115.00 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03254	105.761	BROWNS VALLEY - HANKINSON 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04059	110.4666	P12:345:UMZB:# 109 #: LOS GRT IN ND. LOS GRT
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	105.1787	BARNES 4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03909	107.661	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04538	111.0521	CENTER - SQUARE BUTTE 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03526	100.2755	FERGSFL4 230.00 - WAHPETON 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.9694	J290_SUB 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04207	110.6842	P12:345:UMZB:# 108 #: LOS FT IN ND. LOS FT
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04064	111.907	CNTSHNT3 345.00 - PRAIRIE3 345.00 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03834	105.3945	HIGHWAY 12 - ORTONVILLE 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.2975	J262_J263 115.00 115/34.5KV TRANSFORMER CKT 2
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04369	117.6815	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03908	107.6008	CENTER - COYOTE 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.0602	MAPLE RIVER - PILSBRY4 230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03891	108.3661	BALTA - RAMSEY 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04538	104.7359	CENTER - MPC02100TAP4230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	102.2642	RGBYWN4 230.00 - RUGBY 230KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03976	107.7148	P12:115:UMZZ:# 234 #: HU IN SD. HURON TAP IS A TAP (HU-HUT-WPK & HUT-RDF).
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04074	108.5862	P12:230:UMZB:# 114 #: SB IN SD. SB-WK-GH
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	105.3059	LIVERNE4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	104.2975	J262 J263 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04178	110.6675	P12:345:UMZB:# 103 #: BD IN SD. LOSS OF LINE
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03883	107.7516	PRAIRIE - RAMSEY 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04178	110.674	P12:345:UMZB:# 102 #: AVS BD IN ND. AVS BRD LR
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03656	102.2926	FERGSFL4 230.00 - GRE-SILVRLK4230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	102.7684	MPC02100TAP4230.00 - MPC2100WIND4230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04074	108.5862	P12:230:UMZB:# 117 #: WK IN SD. SB-WK-GH
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03656	102.5354	GRE-SILVRLK4230.00 - HENNING 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04121	109.463	FRONTER4 230.00 - MAPLE RIVER 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03866	105.3054	BLAIR - WATERTOWN 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	105.5492	FORMAN OTP - GWINNER 115KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04178	110.6216	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03254	107.1098	BIG STONE - BROWNS VALLEY 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04026	109.6138	GLENBORO SOUTH - J290 SUB 230.00 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03845	102.7228	BISONMPP4 230.00 - SQUARE BUTTE 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04026	107.7271	J290 SUB 230.00 - RUGBY 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03786	104.7581	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03701	104.2145	GRE-WINGRIV4230.00 - INMANN 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04121	107.9925	FRONTER4 230.00 - WAHPETON 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03939	108.1403	PRAIRIE - WINGER 230KV CKT 1
16ALL	17G	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03861	109.1104	BISON 3 345.00 - MAPLE R3 345.00 345KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04071	118.1659	CENTER - CNTSHTN3 345.00 345KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03866	115.2807	BISON 3 345.00 - MAPLE R3 345.00 345KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	111.413	BARNES 4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	111.2009	LIVERNE4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04033	114.9777	GLENBORO SOUTH - J290 SUB 230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03912	114.126	HURON - WATERTOWN 230KV CKT 2
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	109.6437	BISONMPP4 230.00 - SQUARE BUTTE 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	104.8999	CENTER 230/22.0KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03985	114.1748	FARGO - SHEYNE 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03977	113.776	P12:115:UMZZ:# 234 #: HU IN SD. HURON TAP IS A TAP (HU-HUT-WPK & HUT-RDF).
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04568	129.5025	P12:115:UMZZ:# 232 #: AB IN SD. ABERDEEN A TAP BETWEEN ELLENDALE AND ABERDEEN-SIEBRECHT.
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03892	114.2467	P12:230:UMZB:# 116 #: ST IN SD. WSG-ST-VH
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03244	112.6689	BIG STONE - BROWNS VALLEY 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04543	117.3405	CENTER - SQUARE BUTTE 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04085	114.3774	P12:230:UMZB:# 114 #: SB IN SD. SB-WK-GH
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03945	114.4856	PRAIRIE - WINGER 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03881	113.9919	FT THOMPSON - LETCHER 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03886	114.8781	CHISAGO COUNTY - CHISAGO COUNTY 500KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03661	108.1481	GRE-SILVRLK4230.00 - HENNING 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	108.8633	STANTON 230/18.0KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03896	114.3218	BALTA - RAMSEY 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03913	113.6841	CENTER - COYOTE 345KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	121.2305	BIG STONE 230/24.0KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03977	114.6161	ABERDEEN SIEBRECHT - REDFIELD 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03888	113.7437	PRAIRIE - RAMSEY 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	111.487	FORMAN OTP - GWINNER 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	107.9433	RGBYWND4 230.00 - RUGBY 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03986	113.9841	P12:345:UMZW:# 1747 #: WT2 IN SD. WT2-WHT LINE FAULT
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03826	112.0017	FERGSFL7 115.00 - HOOT LAKE 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03661	107.8867	FERGSFL4 230.00 - GRE-SILVRLK4230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04085	114.3774	P12:230:UMZB:# 117 #: WK IN SD. SB-WK-GH
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04134	113.9523	FRONTER4 230.00 - WAHPETON 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03871	113.3831	BROOKING COUNTY - LYON COUNTY 345KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04134	115.3218	FRONTER4 230.00 - MAPLE RIVER 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03838	111.2652	HIGHWAY 12 - ORTONVILLE 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03244	111.3135	BROWNS VALLEY - HANKINSON 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03791	110.6047	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	111.2248	LIVERNE4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	108.5053	MPC02100TAP4230.00 - MPC2100WIND4230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	108.5034	MPC2100WIND4230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03531	105.2154	FERGSFL4 230.00 - WAHPETON 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03838	111.1133	BIG STONE - HIGHWAY 12 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	107.9335	RGBYWND4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03814	109.7178	BIG STONE (230/115) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	110.0958	J262 J263 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	99.7	COYOTE 345/24.0KV TRANSFORMER CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.04543	108.8651	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03826	112.0086	FERGSFL4 230.00 (230/115) 230/115/13.2KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03661	108.4331	HENNING - INMANN 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03839	103.8183	FORMAN (230/115) 230/115/41.6KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03706	109.9962	GRE-WINGRIV4230.00 - INMANN 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03839	106.5423	FORMAN - FORMAN OTP 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	107.8172	J262 J263 115.00 - JAMESTOWN 115KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03912	114.0733	CARPENTER - WATERTOWN 230KV CKT 1
16ALL	17SP	G15_096	FROM->TO	ELLENDALE - OAKES 230KV CKT 1	319	351	0.03849	110.0958	J262 J263 115.00 115/34.5KV TRANSFORMER CKT 2
16ALL	20L	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03446	100.4746	BASE CASE
16ALL	20L	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.06004	137.6756	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03617	105.7864	ELLENDALE - ELLENDLMVP4 230.00 230KV CKT Z
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	105.7578	GEN659403 1-NDSUNFLWR W0.6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.3332	GEN652457 1-GARRISON
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03816	111.7928	G09_0011ST 345.00 - WATERTOWN 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.5874	GEN672321 1-SHAND GENERATOR 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0378	109.7289	FTTHOMPSON-GRANDPRAIRIE-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.3332	GEN652458 2-GARRISON
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03931	109.6298	SULLYBUTTE-WHITLOCK-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.5607	GEN672306 6-BOUNDARY DAM GENERATOR 6
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.5643	GEN672310 1-POPLAR RIVER GENERATOR 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0378	109.73	GRANDPRAIRIE-FTTHOMPSON-TLINE-REACTORS-CKT1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.0928	GEN659366 3-WILTON 3 W0.6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04078	112.6754	FTTHOMPSON-LELANDOLDS-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.3478	GEN652460 4-GARRISON
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03554	106.6493	BISMARCK - WASHBURN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03554	106.5936	LELAND OLDS - WASHBURN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04278	115.7916	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	99.6	GEN615001 1-COAL CREEK
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04147	113.5735	ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03736	109.0183	JAMES TOWN - VALLEY CITY 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	105.7416	GEN563302 1-G15096_3 0.6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.0968	GEN659010 4-G07_027IS_2 0.6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0378	110.1741	GRANDPRAIRIE-HOLT-TLINE-REACTOR-CKT1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04242	109.9128	BISON - MAURINE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.3883	GEN563342 1-G15098_3 0.6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	105.4052	GEN659110 1-LELAND OLDS UNIT1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04078	112.5987	LELAND OLDS - LELAND2-LNX3345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03931	110.3586	BISMARCK - L3 HAWDON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	105.7439	GEN659407 1-ANTELOPEVALLEY 6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04078	112.6491	FTTHOMPSON-LELANDOLDS-TLINE-REACTORS-CKT1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03948	109.4574	BISMARCK - GRANITE FALLS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03731	109.5153	FARGO - JAMES TOWN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03931	109.6267	SULLY BUTTE - SULLYBT-LNX3230.00 230KV CKT Z
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04147	113.8165	ANTELOPE-LNX3345.00 - BRDLAND-LNX3345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.3478	GEN652461 5-GARRISON
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04151	104.3531	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	103.3223	GEN657749 1-YOUNG 1 GENERATOR
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03629	106.8867	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03617	106.4049	ABERDEEN JCT - ELLENDALE 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03789	110.2839	JAMES TOWN - WEBER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	112.6528	GEN620315 1-BIG STONE GEN
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03816	111.3963	G09_0011ST 345.00 - GROTON 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03466	104.8124	SPLIT ROCK - WHITE 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	105.7683	GEN659453 1-G1414GEN W0.6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0378	109.8884	FTTHOM2-LNX3345.00 - GRPRAR2-LNX3345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0378	110.1743	GRPRAR1-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03931	109.3984	OAHE - SULLY BUTTE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.4704	GEN 10648 1-G830_GEN 0.6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04147	113.5396	BROADLAND - HURON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04278	115.802	LELANDOLDS-GROTON-TLINE-REACTORS-CKT1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	103.8988	GEN562872 1-G15046_3 0.6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	103.0424	GEN659107 2-ANTELOPE VALLEY UNIT2
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03948	110.1824	GRANITE FALLS - MANDAN 4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	101.1874	GEN657748 1-YOUNG 2 GENERATOR
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.06373	164.07	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03789	110.3318	BISMARCK - WEBER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.3332	GEN652459 3-GARRISON
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04147	113.4924	ANTELOPE-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03931	110.6904	GLENHAM - L3 HAWDON 230KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03729	109.47	FARGO - JAMES TOWN 230KV CKT 2
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04147	113.5396	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0378	110.1983	GRPRAR1-LNX3345.00 - HOLT_CO3 345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.5642	GEN672311 2-POPLAR RIVER GENERATOR 2
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0378	109.7654	GRPRAR2-LNX3345.00 - YANKTON 345KV CKT 2
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04078	112.7572	FTTHOM1-LNX3345.00 - LELAND2-LNX3345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03617	105.785	ELLENDALE (ELLENDL TR1) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03714	109.3422	GARRISON - JAMES TOWN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	99.5	GEN615002 2-COAL CREEK
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	103.3319	GEN659111 2-LELAND OLDS UNIT2
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04278	115.7956	GROTON - GROTON-LNX3 345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.6193	GEN659018 1-G14_003IS_3 0.6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	105.8869	GEN657745 1-MPC02100GEN90.6900
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04078	112.6029	FT THOMPSON - FTTHOM1-LNX3345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0378	109.7314	FT THOMPSON - FTTHOM2-LNX3345.00 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	102.4562	GEN661015 1-COYOTE
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	105.8011	GEN659141 1-K10215A
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0363	105.5503	BISMARCK - HILKEN 4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03931	109.7602	GLENHAM - WHITLOK 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03789	110.3467	BISMARCK - JAMES TOWN 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04278	115.9665	GROTON-LNX3 345.00 - LELAND1-LNX3345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03632	105.6697	BIG STONE - BLAIR 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	115.9349	BASE CASE
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03931	109.63	SULLYBT-LNX3230.00 - WHITLOK 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	104.7094	GEN615010 1-STANTON4
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03752	109.2759	WATERLN-LNX3345.00 - WHITE 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04147	113.5398	BRDLAND-LNX3345.00 - HURON 345KV CKT Z
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	103.0424	GEN659103 1-ANTELOPE VALLEY UNIT1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04242	110.3528	BISON - HETINGER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	102.935	GEN659125 1-COVEY
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03554	99	ELLENDALE (ELLENDL TR1) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.06263	152.3467	ELLENDLMVP4 230.00 - MERRCR74 230.00 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.5	GEN659407 1-ANTEPHILLSW0.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN672306 6-BOUNDARY DAM GENERATOR 6
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100.1769	GEN 10572 2-J290_MK10 0.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	105.5504	GEN620315 1-BIG STONE GEN
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.7	GEN659366 3-WILTON 3 W0.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04202	107.0846	GROTON - GROTON-LNX3 345.00 345KV CKT Z
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.4	GEN659403 1-NDSUNFLWR W0.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN652459 3-GARRISON
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.5	GEN659453 1-G11414GEN W0.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03554	99.8	ABERDEEN JCT - ELLENDALE 115KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04076	105.3887	BROADLAND - HURON 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04008	104.489	FTTHOM1-LNX3345.00 - LELAND2-LNX3345.00 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	102.5154	FARGO - JAMES TOWN 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03671	102.4852	JAMES TOWN - VALLEY CITY 115KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.4	GEN659110 1-LELAND OLDS UNIT1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03867	102.319	GLENHAM - WHITLOK 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03554	99	ELLENDALE - ELLENDLMVP4 230.00 230KV CKT Z
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN652460 4-GARRISON
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04008	104.4087	FT THOMPSON - FTTHOM1-LNX3345.00 345KV CKT Z
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100.1802	GEN659018 1-G14_003IS_3 0.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04176	102.6752	BISON - HETINGER 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04008	104.4115	FTTHOMPSON-LELANDOLDS-TLINE-REACTORS-CKT1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04202	107.0888	LELANDOLDS-GROTON-TLINE-REACTORS-CKT1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03649	102.4857	GARRISON - JAMES TOWN 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03664	102.4798	FARGO - JAMES TOWN 230KV CKT 2
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04076	105.3886	BRDLAND-LNX3345.00 - HURON 345KV CKT Z
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04076	105.5956	ANTELOP-LNX3345.00 - BRDLAND-LNX3345.00 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN652458 2-GARRISON
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04076	105.3886	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04008	104.4456	FTTHOMPSON-LELANDOLDS-TLINE-REACTOR-CKT1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.5	GEN657745 1-MPC02100GEN90.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03712	102.5867	GRPRAR1-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03868	102.5342	BISMARCK - L3 HAWDON 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN672311 2-POPLAR RIVER GENERATOR 2
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04202	107.2081	GROTON-LNX3 345.00 - LELAND1-LNX3345.00 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0375	103.9316	G09_0011ST 345.00 - GROTON 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04076	105.5951	ANTELOP-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03723	103.5613	BISMARCK - JAMES TOWN 230KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0375	104.2398	G09_0011ST 345.00 - WATERTOWN 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03723	103.5187	JAMES TOWN - WEBER 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04202	107.0813	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.5	GEN563302 1-G15096_3 0.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03712	102.5866	GRANDPRAIRIE-HOLT-TLINE-REACTOR-CKT1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04076	105.4121	ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03571	99	BISMARCK - HILKEN 4 230.00 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN 10648 1-G830_GEN 0.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03889	103.4186	GRANTE FALLS - MANDAN 4 230.00 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN672310 1-POPLAR RIVER GENERATOR 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03868	103.1126	GLENHAM - L3 HAWDON 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03889	102.8003	BISMARCK - GRANTE FALLS 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN672321 1-SHAND GENERATOR 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04008	104.3921	LELAND OLDS - LELAND2-LNX3345.00 345KV CKT Z
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN652461 5-GARRISON
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN563342 1-G15098_3 0.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.5	GEN659141 1-K10215A
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.7	GEN659010 4-G07_0271S_2 0.6900
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	GEN652457 1-GARRISON
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	108.778	BASE CASE
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03569	99.2	BIG STONE - BLAIR 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03712	102.6044	GRPRAR1-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03723	103.5348	BISMARCK - WEBER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03639	108.498	BISMARCK - HILKEN 4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03563	109.5321	BISMARCK - WASHBURN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04088	115.2634	FT THOMPSON - FTTHOM1-LNX3345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.5444	GEN659403 1-NDSunFLWR W0.6900
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	102.3694	GEN657748 1-YOUNG 2 GENERATOR
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	105.843	GEN657749 1-YOUNG 1 GENERATOR
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03939	113.9538	GLENHAM - L3 HAWDON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0379	112.9001	GRANDPRAIRIE-HOLT-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.1353	GEN652461 5-GARRISON
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.553	GEN659141 1-K10215A
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0379	112.4497	FT THOMPSON - FTTHOM2-LNX3345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03737	112.3719	FARGO - JAMES TOWN 230KV CKT 2
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03939	112.9387	GLENHAM - WHITLOK 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	101.4288	GEN615001 1-COAL CREEK
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.1812	GEN563342 1-G15098_3 0.6900
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.6589	GEN657745 1-MPC02100GEN90.6900
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.4446	GEN672321 1-SHAND GENERATOR 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.4423	GEN659018 1-G14_0031S_3 0.6900
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03956	113.6373	GRANTE FALLS - MANDAN 4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0379	112.9006	GRPRAR1-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03939	112.7952	SULLY BUTTE - SULLYBT-LNX3230.00 230KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04156	116.4248	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03798	113.2948	BISMARCK - WEBER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.4941	GEN563302 1-G15096_3 0.6900
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.1248	GEN659110 1-LELAND OLDS UNIT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03627	108.6476	ELLENDALE - ELLENDLMVP4 230.00 230KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.451	GEN672310 1-POPLAR RIVER GENERATOR 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03474	107.7145	SPLIT ROCK - WHITE 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0374	112.4204	FARGO - JAMES TOWN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04088	115.2464	LELAND OLDS - LELAND2-LNX3345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.06388	169.032	ELLENDLMVP4 230.00 - MERRCR14 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0364	108.5473	BIG STONE - BLAIR 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	105.9713	GEN659111 2-LELAND OLDS UNIT2
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03563	109.4754	LELAND OLDS - WASHBURN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	105.5279	GEN659125 1-COVEY
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03798	113.2445	JAMES TOWN - WEBER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03627	108.6486	ELLENDALE (ELLENDL TR1) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.451	GEN672311 2-POPLAR RIVER GENERATOR 2
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.1353	GEN652460 4-GARRISON
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.2546	GEN 10648 1-G830_GEN 0.6900
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04088	115.3764	FTTHOMPSON-LELANDOLDS-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04252	112.9497	BISON - MAURINE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04156	116.3899	ANTELOP-LNX3345.00 - BRDLAND-LNX3345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03438	99.9	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04289	118.5255	LELAND OLDS - LELAND1-LNX3345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.8895	GEN659010 4-G07_0271S_2 0.6900
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.1209	GEN652457 1-GARRISON

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEA (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	105.6	GEN659103 1-ANTELOPE VALLEY UNIT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03798	113.3104	BISMARCK - JAMES TOWN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	119.0285	BASE CASE
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03939	113.495	BISMARCK - L3 HAWDON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04156	116.4642	ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	101.3198	GEN615002 2-COAL CREEK
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04156	116.4253	BRDLAND-LNX3345.00 - HURON 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0379	112.6652	FTTHOMPSON-GRANDPRAIRIE-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04088	115.3158	FTTHOMPSON-LELANDOLDS-TLINE-REACTORS-CKT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03939	112.7569	SULLYBT-LNX3230.00 - WHITLOK 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04161	106.2093	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.5222	GEN659453 1-G11414GEN W0.6900
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03638	109.7625	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04252	113.146	BISON - HETINGER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03723	112.2308	GARRISON - JAMES TOWN 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.4072	GEN672306 6-BOUNDARY DAM GENERATOR 6
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0379	112.4395	GRANDPRAIRIE-FTTHOMPSON-TLINE-REACTORS-CKT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	104.5507	GEN661015 1-COYOTE
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0379	113.0316	GRPRAR1-LNX3345.00 - HOLT.CO3 345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.1209	GEN652458 2-GARRISON
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03745	111.9977	JAMES TOWN - VALLEY CITY 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.4831	GEN659407 1-ANTELOPEVALLEY-BOARDLAND-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04088	115.479	FTTHOM1-LNX3345.00 - LELAND2-LNX3345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.8938	GEN659366 3-WILTON 3 W0.6900
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04289	118.715	GROTON-LNX3 345.00 - LELAND1-LNX3345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04289	118.53	GROTON - GROTON-LNX3 345.00 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	106.5675	GEN562872 1-G15046 3 0.6900
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03627	109.1698	ABERDEEN JCT - ELLENDALE 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04289	118.4961	LELANDOLDS-GROTON-TLINE-REACTORS-CKT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0379	112.501	GRPRAR2-LNX3345.00 - YANKTON 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.1209	GEN652459 3-GARRISON
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04156	116.425	BROADLAND - HURON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04156	116.3447	ANTELOPE-LNX3345.00 - ANTELOPE VALLEY 345KV CKT Z
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03939	112.5526	OAHE - SULLY BUTTE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	107.3501	GEN615010 1-STANTON4
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0379	112.6587	FTTHOM2-LNX3345.00 - GRPRAR2-LNX3345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03956	112.7727	BISMARCK - GRANTE FALLS 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	105.6	GEN659107 2-ANTELOPE VALLEY UNIT2
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03939	112.7598	SULLYBUTTE-WHITLOCK-TLINE-REACTOR-CKT1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03826	113.9163	G09_0011ST 345.00 - GROTON 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	115.671	GEN620315 1-BIG STONE GEN
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03826	114.3647	G09_0011ST 345.00 - WATERTOWN 345KV CKT 1
16ALL	20L	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03642	100.3376	ROSEAU - ROSEAUM 2 500.00 500KV CKT 1
16ALL	20L	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03642	100.339	ROSEAU - ROSEAUM 2 500.00 500KV CKT 1
16ALL	20L	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03642	100.4445	FORBES - ROSEAU 500KV CKT 1
16ALL	20L	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03923	100.2757	BUFFALO - JAMESTOWN 345KV CKT 1
16ALL	20L	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03642	100.4337	RIEL - ROSEAU 500KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	105.9638	J262_J263 115.00 115/34.5KV TRANSFORMER CKT 2
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04163	122.2898	BUFFALO - JAMESTOWN 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.3975	G830 SUB 115.00 - GRE-MCHENRY7115.00 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03767	112.387	CHISAGO COUNTY - CHISAGO COUNTY 500KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04006	116.8678	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03616	106.3544	BROOKING COUNTY - LYON COUNTY 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03617	106.1081	P12-115:UMZZ:# 232 #: AB IN SD. ABERDEEN A TAP BETWEEN ELLENDALE AND ABERDEEN-SIEBRECHT.
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.6883	LUVERNE4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04147	113.5732	P12-345:UMZB:# 103 #: BD IN SD. LOSS OF LINE
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	104.815	STANTON 230/18.0KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	104.7482	RGBYWNDA 230.00 - RUGBY 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03618	106.6257	FERGSFL4 230.00 - GRE-SILVRLK4230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03811	112.2245	CNTSHINT3 345.00 - PRAIRIE3 345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04147	113.5735	P12-345:UMZB:# 102 #: AVS BD IN ND. AVS BRD LR
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03931	109.6808	P12-230:UMZB:# 114 #: SB IN SD. SB-WK-GH
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04278	115.802	P12-345:UMZB:# 109 #: LOS GRT IN ND. LOS GRT
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04147	113.5396	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03554	106.6792	P12-230:UMZW:# 170 #: WB IN ND. 230 LINE FAULT (TAP)
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03435	102.0549	FORMAN - HANKINSON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	101.6627	CENTER 230/22.0KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	105.9638	J262_J263 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.4203	J290 SUB 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03803	110.5477	GLENBORO SOUTH - J290 SUB 230.00 230KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03466	104.8124	SPLIT ROCK - WHITE 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03632	105.6697	BIG STONE - BLAIR 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03629	106.8867	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04151	111.8276	CENTER - SQUARE BUTTE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03649	106.6354	BIG STONE (230/115) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	104.2101	J262_J263 115.00 - JAMESTOWN 115KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03689	102.5097	HANKINSON - WAHPETON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	100.2424	COYOTE 345/24.0KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03767	112.5743	CHISAGO COUNTY - FORBES 500KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03931	109.6808	P12:230:UMZB:# 117 #: WK IN SD. SB-WK-GH
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.3961	G830_SUB 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04151	106.5338	CENTER - MPC02100TAP4230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03554	106.6792	P12:230:UMZB:# 171 #: WB IN ND.
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04207	117.7631	CENTER - JAMESTOWN 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03667	109.2569	BISON 3 345.00 - MAPLE R3 345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	104.8929	RGBYWND4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03595	106.3569	FERGSFL4 230.00 - WAHPETON 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	104.9778	MPC2100WIND4230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03317	100.4731	BROOKING COUNTY - BSSOUTH3 345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	104.9788	MPC02100TAP4230.00 - MPC2100WIND4230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03787	109.1998	FRONTER4 230.00 - MAPLE RIVER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	105.8427	BISONMPP4 230.00 - SQUARE BUTTE 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	112.0839	BIG STONE 230/24.0KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04078	112.6491	P12:345:UMZB:# 108 #: LOS FT IN ND. LOS FT
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.6861	LUVERNE4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03714	109.1973	PRAIRIE - WINGER 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03824	110.6037	ALEXMRES3 345.00 - BISON 3 345.00 345KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03683	109.1903	BALTA - RAMSEY 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03657	106.2913	MAPLE RIVER - PILSBRY4 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04151	104.3531	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04202	107.0888	P12:345:UMZB:# 109 #: LOS GRT IN ND. LOS GRT
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04008	104.4115	P12:345:UMZB:# 108 #: LOS FT IN ND. LOS FT
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03737	102.8104	J290_SUB 230.00 - RUGBY 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.6	J262_J263 115.00 115/34.5KV TRANSFORMER CKT 2
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.6	LANGDON - LANGWIN7 115.00 115KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03619	102.3623	BALTA - RAMSEY 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03797	109.591	ROSEAU - ROSEAU 2 500.00 500KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03534	99.9	FERGSFL4 230.00 - WAHPETON 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.3	BARNES 4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03746	105.6701	CNTSHNT3 345.00 - PRAIRIE3 345.00 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04076	105.3886	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04076	105.4118	P12:345:UMZB:# 103 #: BD IN SD. LOSS OF LINE
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04132	109.5261	CENTER - JAMESTOWN 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03569	99.2	BIG STONE - BLAIR 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03935	108.9005	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03797	109.5964	RIEL - ROSEAU 500KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	LUVERNE4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	G830_SUB 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	J290_SUB 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04082	104.6639	CENTER - SQUARE BUTTE 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03867	102.2386	P12:230:UMZB:# 117 #: WK IN SD. SB-WK-GH
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03867	102.2386	P12:230:UMZB:# 114 #: SB IN SD. SB-WK-GH
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04082	99.1	CENTER - MPC02100TAP4230.00 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03554	99.7	P12:115:UMZZ:# 232 #: AB IN SD. ABERDEEN A TAP BETWEEN ELLENDALE AND ABERDEEN-SIEBRECHT.
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03701	102.6862	CHISAGO COUNTY - FORBES 500KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03797	109.591	ROSEAU - ROSEAU 2 500.00 500KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03701	102.6375	CHISAGO COUNTY - CHISAGO COUNTY 500KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03737	104.5044	GLENBORO SOUTH - J290_SUB 230.00 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03758	103.1077	ALEXMRES3 345.00 - BISON 3 345.00 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	100	G830_SUB 115.00 - GRE-MCHENRY7115.00 115KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04088	113.2581	BUFFALO - JAMESTOWN 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03594	99.6	J262_J263 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03604	102.8673	BISON 3 345.00 - MAPLE R3 345.00 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03722	102.8383	FRONTER4 230.00 - MAPLE RIVER 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03556	100	BROOKING COUNTY - LYON COUNTY 345KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04076	105.4121	P12:345:UMZB:# 102 #: AVS BD IN ND. AVS BRD LR
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04216	121.1114	CENTER - JAMESTOWN 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03692	111.9183	BALTA - RAMSEY 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03939	112.8509	P12:230:UMZB:# 117 #: WK IN SD. SB-WK-GH
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVPA 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03717	112.1126	PRAIRIE - WINGER 230KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATE (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03627	108.9724	P12:115:UMZZ:# 232 #: AB IN SD. ABERDEEN A TAP BETWEEN ELLENDALE AND ABERDEEN-SIEBRECHT.
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.7304	J262_J263 115.00 115/34.5KV TRANSFORMER CKT 2
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.187	J290_SUB 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04088	115.3158	P12:345:UMZB:# 108 #: LOS FT IN ND. LOS FT
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03474	107.7145	SPLIT ROCK - WHITE 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04161	108.4019	CENTER - MPC02100TAP4230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03939	112.8509	P12:230:UMZB:# 114 #: SB IN SD. SB-WK-GH
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03563	109.5655	P12:230:UMZW:# 170 #: WB IN ND. 230 LINE FAULT (TAP)
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03563	109.5655	P12:230:UMZB:# 171 #: WB IN ND.
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03443	104.7703	FORMAN - HANKINSON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	107.7547	MPC2100WIND4230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	106.9306	J262_J263 115.00 - JAMESTOWN 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03325	103.33	BROOKING COUNTY - BSSOUTH3 345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04014	120.0326	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	107.5308	RGBYWND4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03438	99.9	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03627	109.4924	FERGSFL4 230.00 - GRE-SILVRLK4230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.5407	LUVERNE4 230.00 - PILSBRY4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0364	108.5473	BIG STONE - BLAIR 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03797	112.2217	FRONTER4 230.00 - MAPLE RIVER 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03719	109.7303	FORMAN (230/115) 230/115/41.6KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.585	BISONMP4 230.00 - SQUARE BUTTE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.1808	G830_SUB 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03834	113.604	ALEXMRES3 345.00 - BISON 3 345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	107.7558	MPC02100TAP4230.00 - MPC2100WIND4230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03638	109.7625	BLAIR - GRANITE FALLS 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04161	113.8693	CENTER - SQUARE BUTTE 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03821	115.2008	CNTSHNT3 345.00 - PRAIRIE3 345.00 345KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	115.1338	BIG STONE 230/24.0KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.7304	J262_J263 115.00 115/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	104.1714	CENTER 230/22.0KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03813	113.609	GLENBORO SOUTH - J290_SUB 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	108.8486	MAPLE RIVER - PILSBRY4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	99.2	YNG2 4 230.00 230/20.0KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.5049	LUVERNE4 230.00 230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03604	109.2004	FERGSFL4 230.00 - WAHPETON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04161	106.2093	MANDAN 4 230.00 - MPC02100TAP4230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.0343	100.1516	FORMAN - OAKES 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04156	116.4248	HURON (BD KU2A) 345/230/13.8KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	102.0488	COYOTE 345/24.0KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	107.54	RGBYWND4 230.00 - RUGBY 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	109.1824	G830_SUB 115.00 - GRE-MCHENRY7115.00 115KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04156	116.4636	P12:345:UMZB:# 103 #: BD IN SD. LOSS OF LINE
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03698	104.9376	HANKINSON - WAHPETON 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04156	116.4642	P12:345:UMZB:# 102 #: AVS BD IN ND. AVS BRD LR
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03813	112.1283	J290_SUB 230.00 - RUGBY 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.04289	118.4961	P12:345:UMZB:# 109 #: LOS GRT IN ND. LOS GRT
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03666	99.2	SQUARE BUTTE - YNG2 4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03658	109.4845	BIG STONE (230/115) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1	319	343	0.03625	109.2267	BROOKING COUNTY - LYON COUNTY 345KV CKT 1
16ALL	20L	G15_096	TO->FROM	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1	319	383	0.05873	117.9899	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1	319	383	0.06233	141.6895	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1
16ALL	20SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1	319	383	0.06233	107.3699	J316_SUB 230.00 - TATANKA 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1	319	383	0.06126	131.0428	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1	319	383	0.06248	111.3093	J316_SUB 230.00 - TATANKA 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1	319	383	0.06248	146.1681	ELLENDLMVP4 230.00 - J316_SUB 230.00 230KV CKT 1
16ALL	20SP	G15_096	FROM->TO	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1	319	351	0.04084	115.2352	ELLENDLMVP3 345.00 (1) 345/230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	FROM->TO	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1	319	351	0.04084	115.2317	BSSOUTH3 345.00 - ELLENDLMVP3 345.00 345KV CKT 1
16ALL	20WP	G15_096	FROM->TO	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1	319	351	0.04006	109.0733	BSSOUTH3 345.00 - ELLENDLMVP3 345.00 345KV CKT 1
16ALL	20WP	G15_096	FROM->TO	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1	319	351	0.04006	109.0815	ELLENDLMVP3 345.00 (1) 345/230/34.5KV TRANSFORMER CKT 1
16ALL	25SP	G15_096	FROM->TO	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1	319	351	0.04097	118.8741	BSSOUTH3 345.00 - ELLENDLMVP3 345.00 345KV CKT 1
16ALL	25SP	G15_096	FROM->TO	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1	319	351	0.04097	118.9568	ELLENDLMVP3 345.00 (1) 345/230/34.5KV TRANSFORMER CKT 1
16ALL	20SP	G15_096	FROM->TO	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1	319	351	0.04084	115.2317	BSSOUTH3 345.00 - ELLENDLMVP3 345.00 345KV CKT 1
16ALL	25SP	G15_096	FROM->TO	ELLENDLMVP4 230.00 - OAKES 230KV CKT 1	319	351	0.04097	118.8741	BSSOUTH3 345.00 - ELLENDLMVP3 345.00 345KV CKT 1
16ALL	20SP	G15_096	FROM->TO	FARGO - SHEYNNE 230KV CKT 1	342	342	0.07851	109.7626	CENTER - JAMESTOWN 345KV CKT 1
16ALL	20SP	G15_096	FROM->TO	FARGO - SHEYNNE 230KV CKT 1	342	342	0.07837	130.7083	BUFFALO - JAMESTOWN 345KV CKT 1
16ALL	25SP	G15_096	FROM->TO	FARGO - SHEYNNE 230KV CKT 1	342	342	0.0784	113.863	CENTER - JAMESTOWN 345KV CKT 1
16ALL	25SP	G15_096	FROM->TO	FARGO - SHEYNNE 230KV CKT 1	342	342	0.06567	100.3624	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	17SP	G15_096	TO->FROM	FORMAN - OAKES 230KV CKT 1	409	450	0.04589	101.3946	ELLENDALE (ELLENDL TR1) 230/115/13.8KV TRANSFORMER CKT 1
16ALL	17SP	G15_096	TO->FROM	FORMAN - OAKES 230KV CKT 1	409	450	0.04589	99.7	ABERDEEN JCT - ELLENDALE 115KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEA (MVA)	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
16ALL	17SP	G15_096	TO->FROM	FORMAN - OAKES 230KV CKT 1	409	450	0.04589	99.5	P12:115:UMZZ:# 232 #: AB IN SD. ABERDEEN A TAP BETWEEN ELLENDALE AND ABERDEEN-SIEBRECHT.
16ALL	20SP	G15_096	TO->FROM	J316 SUB 230.00 - TATANKA 230KV CKT 1	319	343	0.06373	121.1302	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1
16ALL	20WP	G15_096	TO->FROM	J316 SUB 230.00 - TATANKA 230KV CKT 1	319	343	0.06263	109.6893	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1
16ALL	25SP	G15_096	TO->FROM	J316 SUB 230.00 - TATANKA 230KV CKT 1	319	343	0.06388	125.6287	ELLENDLMVP4 230.00 - MERRCRT4 230.00 230KV CKT 1
16ALL	16WP	G15_096	FROM->TO	MAPLE RIVER TAP NORTH - SHEYNNE 115KV CKT 1	159	159	0.03108	135.062	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	17G	G15_096	FROM->TO	MAPLE RIVER TAP NORTH - SHEYNNE 115KV CKT 1	147	162	0.03128	128.7365	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	20SP	G15_096	FROM->TO	MAPLE RIVER TAP NORTH - SHEYNNE 115KV CKT 1	147	162	0.03103	141.191	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	20WP	G15_096	FROM->TO	MAPLE RIVER TAP NORTH - SHEYNNE 115KV CKT 1	159	159	0.03037	132.48	BISON 3 345.00 - BUFFALO 345KV CKT 1
16ALL	25SP	G15_096	FROM->TO	MAPLE RIVER TAP NORTH - SHEYNNE 115KV CKT 1	147	162	0.03107	151.0815	BISON 3 345.00 - BUFFALO 345KV CKT 1

B: Affected System Voltage Power Flow Analysis (Constraints for Potential Transmission Reinforcement)

See next page.

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	MONITORED ELEMENT	TC Voltage		Voltage Differ				TDF	CONTINGENCY	COMMENTS
						BC Voltage (PU)	(PU)	(PU)	VINIT (PU)	VMIN (PU)	VMAX(PU)			
FDNSLock	16ALL	ZSSP	0	16ALL_B10T_DCTIE	DRAYTON 115KV	1.078163	1.058374	0.0197891	1.0348	0.9	1.05	0.04345	CENTER - CNTSHINT3 345.00 345KV CRT 21	
FDNSLock	16ALL	ZSSP	0	16ALL_B10T_DCTIE	DRAYTON 115KV	1.078163	1.058374	0.0197891	1.0348	0.9	1.05	0.04783	CENTER - CNTSHINT3 345.00 345KV CRT 21	
FDNSLock	16ALL	ZSSP	0	16ALL_B10T_DCTIE	DRAYTON 115KV	1.078163	1.058374	0.0197891	1.0348	0.9	1.05	0.04722	CENTER - CNTSHINT3 345.00 345KV CRT 21	
FDNSLock	16ALL	ZSSP	0	16ALL_B10T_DCTIE	CNTSHINT3 345.00 345KV	1.232244	1.200489	0.031755	0.98976	0.9	1.05	0.04345	CENTER - CNTSHINT3 345.00 345KV CRT 21	
FDNSLock	16ALL	ZSSP	0	16ALL_B10T_DCTIE	CNTSHINT3 345.00 345KV	1.232244	1.200489	0.031755	0.98976	0.9	1.05	0.04783	CENTER - CNTSHINT3 345.00 345KV CRT 21	
FDNSLock	16ALL	ZSSP	0	16ALL_B10T_DCTIE	CNTSHINT3 345.00 345KV	1.232244	1.200489	0.031755	0.98976	0.9	1.05	0.04722	CENTER - CNTSHINT3 345.00 345KV CRT 21	
FDNSLock	16ALL	ZSSP	0	16ALL_B10T_DCTIE	CNTSHINT3 345.00 345KV	1.232244	1.200489	0.031755	0.98976	0.92	1.1	0.04345	CENTER - CNTSHINT3 345.00 345KV CRT 21	
FDNSLock	16ALL	ZSSP	0	16ALL_B10T_DCTIE	CNTSHINT3 345.00 345KV	1.232244	1.200489	0.031755	0.98976	0.92	1.1	0.04783	CENTER - CNTSHINT3 345.00 345KV CRT 21	
FDNSLock	16ALL	ZSSP	0	16ALL_B10T_DCTIE	CNTSHINT3 345.00 345KV	1.232244	1.200489	0.031755	0.98976	0.92	1.1	0.04722	CENTER - CNTSHINT3 345.00 345KV CRT 21	
FDNSLock	16ALL	ZSSP	0	16ALL	PRAIRIE3 345.00 345KV	0.986694	0.967664	0.0190296	0.96766	0.97	1.05	0.04784	System Intact	