

Interim Availability
Interconnection System
Impact Study for Generator
Interconnection Requests

GEN-2014-031
GEN-2014-032

August 2015
Generator Interconnection



Revision History

Date	Author	Change Description
7/30/2015	SPP	Interim Availability Interconnection System Impact Study for GEN-2014-031 and GEN-2014-032 Report Issued
8/17/2015	SPP	Revised for error correction and additional analysis of N-1-1 scenarios.

Executive Summary

<OMITTED TEXT> Interconnection Customers have requested an Interim Availability Interconnection System Impact Study (IAISIS) under Section 11A of Attachment V (Generator Interconnection Procedures - GIP) to the Southwest Power Pool Open Access Transmission Tariff (OATT) for Generator Interconnection Requests (GIRs) GEN-2014-031 and GEN-2014-032. Both GIRs have requested both Energy Resource Interconnection Service (ERIS) and Network Resource Interconnection Service (NRIS) into the Transmission System of Nebraska Public Power District (NPPD) in Madison County, Nebraska. GEN-2014-031 and GEN-2014-032 have requested this IAISIS to determine the impacts of interconnecting to the transmission system before all required Interconnection Studies can be completed and all Network Upgrades identified in the DISIS-2014-002 (or most recent iteration) Impact Study can be placed into service. Eligibility for Interim Interconnection Service is governed by Section 11A.2 of the GIP.

This IAISIS addresses the effects of interconnecting the generators to the rest of the transmission system for the system topology and conditions as expected on or after September 1, 2015. GEN-2014-031 is a 35.8 MW wind generating facility and has requested an updated In-Service Date of December 1, 2015. GEN-2014-032 is a 10.2 MW uprate to an existing wind generating facility (GEN-2008-086N02) and has requested an updated In-Service Date of September 1, 2015. For this IAISIS, only power flow analysis was conducted. The IAISIS 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 IAISIS may need to be restudied to ensure that interconnection service remains for the customer's request.

Power flow analysis from this IAISIS has determined that the GIRs GEN-2014-031 and GEN-2014-032 can interconnect 46 MW of generation only with Energy Resource Interconnection Service allowed prior to the completion of the required Network Upgrades, listed within Table 2 of this report. Results from this analysis can be found in Tables 4-11. 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 Interim Interconnection service remains available. It should be noted that although this IAISIS 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, otherwise known as curtailment, to 0 MW under certain system conditions to allow system operators to maintain the reliability of the transmission network.

Transient stability analysis was not performed for this IAISIS study. The results from DISIS 2014-002 or latest iteration remain valid.

For the Interconnection Request(s) to move forward into Interim Interconnection Service, the Interconnection Customer will be required to execute an Interim Generator Interconnection Agreement (IGIA). If the Interconnection Facilities Study can be completed prior to the execution of the IGIA, then customer may proceed to executing a final GIA and this study may be used for the purpose of a Limited Operation Impact Study under Article 5.9 of the pro-forma GIA.

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

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Purpose

<OMITTED TEXT> Interconnection Customers have requested an Interim Availability Interconnection System Impact Study (IAISIS) under Section 11A of Attachment V (Generator Interconnection Procedures - GIP) to the Southwest Power Pool Open Access Transmission Tariff (OATT) into the transmission system of Nebraska Public Power District (NPPD).

The purpose of this study is to evaluate the impacts of interconnecting Generator Interconnection Requests (GIRs) GEN-2014-031 and GEN-2014-032 prior to the completion of the required Interconnection Studies and prior to the in-service date of the required Network Upgrades, listed within Table 2 of this report. GEN-2014-031 is a 35.8 MW wind Generating Facility and has requested an updated In-Service Date of December 1, 2015. GEN-2014-032 is a 10.2 MW uprate to an existing wind Generating Facility (GEN-2008-086N02) and has requested an updated In-Service Date of September 1, 2015. Both GIRs share the same Point of Interconnection, NPPD's Meadow Grove 230 kV substation located in Madison County, Nebraska. This IAISIS addresses the effects of interconnecting the generators to the rest of the transmission system for the system topology and conditions as expected on or after September 1, 2015. Only power flow analysis was conducted for this IAISIS.

The IAISIS 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 GIA or requested that an unexecuted GIA 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 IAISIS 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 and export power from the Generating Facility. Should the Customer require transmission service, those rights should be requested through SPP's Open Access Same-Time Information System (OASIS).

This IAISIS 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 September 2015 In-Service Date for this IAISIS. 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
GEN-2003-021N	75.0	75.0	Wind	Ainsworth Wind 115kV	Commercial Operation
GEN-2004-023N	75.0	75.0	Coal	Columbus Co 115kV	Commercial Operation
GEN-2006-020N	42.0	42.0	Wind	Bloomfield 115kV	Commercial Operation
GEN-2006-031N	75.0	75.0	Wind	Broken Bow 115kV	Commercial Operation
GEN-2006-038N05	80.0	80.0	Wind	Broken Bow 115kV	Commercial Operation
GEN-2006-038N19	80.0	80.0	Wind	Petersburg North 115kV	Commercial Operation
GEN-2006-044N	40.5	40.5	Wind	Petersburg North 115kV	Commercial Operation
GEN-2007-011N08	81.0	81.0	Wind	Bloomfield 115kV	Commercial Operation
GEN-2008-086N02	201.0	201.0	Wind	Meadow Grove 230kV	Commercial Operation
GEN-2008-119O	60.0	60.0	Wind	S1399 161kV	Commercial Operation
GEN-2008-123N	89.7	89.7	Wind	Rosemont 115kV (Tap Pauline – Hildreth 115kV)	GIA Executed/On Schedule for 12/2016 COD
GEN-2009-040	73.8	73.8	Wind	Marshall 115kV	GIA Executed/On Schedule for 5/2016 COD
GEN-2010-041	10.5	10.5	Wind	S1399 161kV	GIA Executed/On Schedule for 12/2015 COD
GEN-2010-051	200.0	200.0	Wind	Dixon Co 230kV (Tap Twin Church – Hoskins 230kV)	GIA Executed/Suspended
GEN-2011-018	73.6	73.6	Wind	Steele City 115kV	Commercial Operation
GEN-2011-027	120.0	120.0	Wind	Dixon Co 230kV (Tap Twin Church – Hoskins 230kV)	GIA Executed/Suspended
GEN-2011-056	3.6	3.6	Hydro	Jeffrey 115kV	Commercial Operation
GEN-2011-056A	3.6	3.6	Hydro	John 1 115kV	Commercial Operation
GEN-2011-056B	4.5	4.5	Hydro	John 2 115kV	Commercial Operation
GEN-2012-021	4.8	4.8	LF Gas	Terry Bundy Station 115kV	Commercial Operation
GEN-2013-002	50.6	50.6	Wind	Tap Sheldon - Folsom & Pleasant Hill 115kV CKT 2	GIA Executed/On Schedule for 12/2017 COD
GEN-2013-008	1.2	1.2	Wind	Steele City 115kV	Commercial Operation
GEN-2013-014	25.5	25.5	Wind	Rosemont 115kV (Tap Pauline – Hildreth 115kV)	GIA Executed/Suspended
GEN-2013-019	73.6	73.6	Wind	Tap Sheldon - Folsom & Pleasant Hill 115kV CKT 2	GIA Executed/On Schedule for 12/2017 COD
GEN-2013-032	204.0	204.0	Wind	Antelope 115kV	GIA Executed/On Schedule for 6/2017 COD
GEN-2014-004	3.96	3.96	Wind	Steele City 115kV	Commercial Operation
GEN-2014-013	73.5	73.5	Wind	Meadow Grove 230kV	GIA Executed/On Schedule for 12/2015 COD
GEN-2014-039	73.4	73.4	Wind	Friend 115kV	Facility Study Stage
NPPD Distributed (Broken Bow)	8.3	8.3		Broken Bow 115kV	Commercial Operation
NPPD Distributed (Burt County Wind)	12.0	12.0		Tekamah & Oakland 115kV	Commercial Operation
NPPD Distributed (Burwell)	3.0	3.0		Ord 115kV	Commercial Operation
NPPD Distributed (Columbus Hydro)	45.0	45.0		Columbus 115kV	Commercial Operation
NPPD Distributed (North Platte - Lexington)	54.0	54.0		Jeffrey 115kV, John 1 115kV, John 2 115kV	Commercial Operation
NPPD Distributed (Ord)	11.9	11.9		Ord 115kV	Commercial Operation
NPPD Distributed (Stuart)	2.1	2.1		Ainsworth 115kV	Commercial Operation
GEN-2014-031	35.8	35.8	Wind	Meadow Grove 230kV	Facility Study Stage
GEN-2014-032	10.2	10.2	Wind	Meadow Grove 230kV	Facility Study Stage

Additional sensitivities analyzed were performed without the prior queued GEN-2010-051/GEN-2011-027 and GEN 2013-032 taken out of service.

This IAISIS was required because the Interconnection Customers requested interconnection prior to the completion of all of the 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 either have cost responsibility or is required for full interconnection service. GEN-2014-031 and GEN-2014-032 were included within the DISIS-2014-002 that was studied in fall 2014 and posted January 31, 2015. 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=2014_Impact_Studies

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

Constraint	Type	Upgrade Description	Status
Battle Creek – County Line 115kV ckt 1	Transmission Line Rebuild	Rebuild approximately 11 miles of 115kV	Awaiting Authorization to Proceed
County Line – Neligh East 115kV ckt 1	Transmission Line Rebuild	Rebuild approximately 12 miles of 115kV	Awaiting Authorization to Proceed
Hoskins – Dixon County – Twin Church 230kV ckt 1	Transmission Line Rerate	Rerate per NPPD Facility Study	Awaiting Authorization to Proceed
Hoskins – Neligh 345/115kV Project	New Substation	Per SPP 2014 ITPNT and NTC 200253	Currently scheduled for 6/2016 In-Service Date
Twin Church – Dixon County 230 kV ckt 1	Transmission Line Rerate	Increase conductor clearances to accommodate 320MVA rate	Awaiting Authorization to Proceed

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 IAISIS at the expense of the 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 IAISIS, either because no request for an IAISIS 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
None					

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

Two GIRs were included in this study. GEN-2014-031 requests interconnection of 35.8MW, comprised of twenty (20) GE 1.79MW wind turbine generators and associated facilities. GEN-2014-032 requests a 10.2MW uprate to the existing GEN-2008-086N02 Generating Facility which, including this uprate, would be comprised of one-hundred eighteen (118) GE 1.79MW wind turbine generators totaling 211.22MW.

Interconnection Facilities

The POI for GEN-2014-031 and GEN-2014-032 is the NPPD Meadow Grove 230kV substation in Madison County, Nebraska. Figure 1 depicts the one-line diagram of the local transmission system including the POI as well as the power flow model representing the area requests.

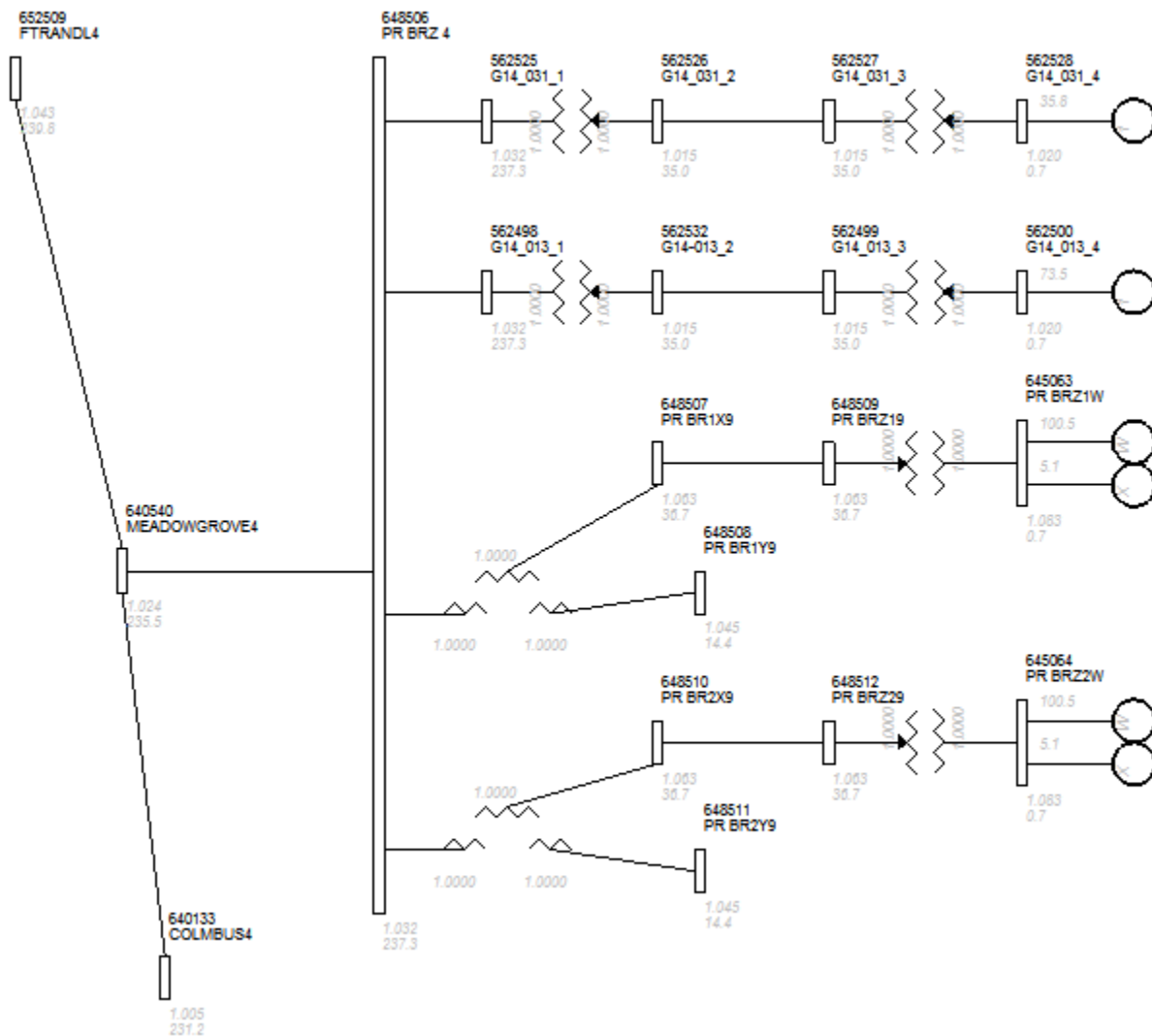


Figure 1: Proposed POI Configuration and Requests Power Flow Model

Base Case Network Upgrades

The Network Upgrades included within the cases used for this IAISIS study are those facilities that are a part of the SPP Transmission Expansion Plan or the Balanced Portfolio projects that have in-service dates prior to the GEN-2014-031 and GEN-2014-032 IAISIS requested in-service dates of September 1, 2015 and December 1, 2015. 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 IAISIS. 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 Interconnection Customers.

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 2014 series of transmission service request study models including the 2015 (spring and summer) seasonal models. To incorporate the Interconnection Customers' requests, a re-dispatch of existing generation within SPP was performed with respect to the amount of the Customer's injection and the interconnecting Balancing Authority. This method allows the request to be studied as a Network Resource (NRIS) Interconnection Request. For this IAISIS, only the previous queued requests listed in Table 1 were assumed to be in-service. Additional sensitivities were analyzed and will also be discussed within this report.

Study Methodology and Criteria

The ACCC function of PSS/E is used to simulate contingencies, including single and multiple facility (i.e. breaker-to-breaker, etc.) outages, within all of the control areas of SPP and other control areas external to SPP and the resulting data analyzed. This satisfies the "more probable" contingency testing criteria mandated by NERC and the SPP criteria.

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 IAISIS ACCC analysis indicates that the Customers can interconnect their generation only with Energy Resource Interconnection Service into the NPPD transmission system before all required upgrades listed within the DISIS-2014-002 study or latest iteration can be placed into service. Should any other GIRs, other than those listed within Table 1 of this report, come into service an additional study may be required to determine if any interim interconnection service remains available.

ACCC results for the IAISIS can be found in Tables 4 through 11 below.

Table 4 contains the overloads given all prior queued requests listed in Table 1 are in-service and all of the transmission upgrades listed in Table 2 are not yet in service. Table 5 contains the overloads

that have less than 20% TDF impact and do not require transmission reinforcement however, these constraints may require curtailment. Generator Interconnection Energy Resource analysis doesn't mitigate for those issues in which the affecting GIR has less than a 20% OTDF impact, but Table 5 is provided for informational purposes so that the Interconnection Customer understands there may be operational conditions when they may be required to reduce their output to maintain system reliability.

Three scenarios were analyzed to determine the impacts of GEN-2014-031 and GEN-2014-032 on the transmission system if prior queued requests were not included in the dispatch. The results of this analysis can be found in Tables 6-9. Scenario 1 removed the prior queued requests GEN-2010-051/GEN-2011-027 and indicated, Table 6, no overloads that could be attributed to either GEN-2014-031 or GEN-2014-032. Scenario 2, results shown in Table 7, removed the prior queued request GEN-2013-032 and showed no overloads that could be attributed to either GEN-2014-031 or GEN-2014-032. Scenario 3 removed the prior queued requests GEN-2010-051/GEN-2011-027 and GEN-2013-032 and indicated, Table 8, no overloads that could be attributed to either GEN-2014-031 or GEN-2014-032. Table 9 contains the overloads that have less than 20% TDF impact and do not require transmission reinforcement however, these constraints may require curtailment.

Two additional scenarios, results found in Tables 10 and 11, were reviewed to analyze a prior outage of a transmission facility. For a prior outage of the 230 kV from Meadow Grove – Fort Randall, no significant constraints were seen under additional contingencies on the system. However, when Meadow Grove – Kelly (Columbus) 230kV is already out of service, the system can become highly constrained under the next area outage and curtailment of generating resources should be expected until the system can return to reliable operating conditions.

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 Mitigation (OTDF ≥ 20%)

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Max MW Available	Contingency
		G14-031		None					35.8	
		G14-032		None					10.2	

Table 5: Additional Interconnection Constraints for Mitigation by Curtailment (3% ≥ OTDF ≤ 20% and Informational Only)

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.030	99.9	'KELLY (Columbus) - MEADOWGROVE4230.00 230KV CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.030	103.4	'KELLY (Columbus) - MEADOWGROVE4230.00 230KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.030	99.9	'KELLY (Columbus) - MEADOWGROVE4230.00 230KV CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.030	103.4	'KELLY (Columbus) - MEADOWGROVE4230.00 230KV CKT 1'

Table 6: Interconnection Constraints for GEN-2010-051/GEN-2011-027 Not In-Service

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Max MW Available	Contingency
		G14-031		None					35.8	
		G14-032		None					10.2	

Table 7: Interconnection Constraints for GEN-2013-032 Not In-Service

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Max MW Available	Contingency
		G14-031		None					35.8	
		G14-032		None					10.2	

Table 8: Interconnection Constraints for GEN-2010-051/GEN-2011-027 and GEN-2013-032 Not In-Service

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Max MW Available	Contingency
		G14-031		None					35.8	
		G14-032		None					10.2	

Power Flow Analysis

Table 9: Additional Interconnection Constraints for GEN-2010-051/GEN-2011-027 & GEN-2013-032 Not In-Service ((3% ≥ OTDF ≤ 20%) Mitigation by Curtailment)

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
		G14_031		None					
		G14_032		None					

Table 10: Additional Interconnection Constraints during prior outage of Meadow Grove – Ft. Randall 230kV ((3% ≥ OTDF ≤ 20%) Mitigation by Curtailment)

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
		G14_031		None					
		G14_032		None					

Table 11: Additional Interconnection Constraints during prior outage of Meadow Grove – Kelly (Columbus) 230kV ((3% ≥ OTDF ≤ 20%) Mitigation by Curtailment)

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15G	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	127.7	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	125.7	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	127.9	'COUNTY LINE - NELIGH 115KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	125.2	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	115.3	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	127.1	'COUNTY LINE - NELIGH 115KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.032	103.1	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.036	103.4	'HOSKINS - SHELL CREEK 345KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.035	105.1	'FT THOMPSON - GRAND ISLAND 345KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.033	102.0	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.030	102.2	'GAVINS POINT - SPIRIT MOUND 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	129.4	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	124.5	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	129.5	'COUNTY LINE - NELIGH 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	127.9	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	127.3	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV
15SP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.032	103.8	'NEB02WAPAB2': DISCONNECT HARTINGTON
15WP	09ALL	G14_031	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	129.6	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	120.6	'DIXONCO 230.00 - HOSKINS 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	108.8	'DIXONCO 230.00 - TWIN CHURCH 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.033	112.3	'AINSWORTH - STUART 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	140.3	'ALBION - GENOA 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	167.1	'ALBION - PETERSBURG 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	118.5	'ALBION - SPALDING 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.033	112.7	'ATKINSON - EMMET 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.033	112.4	'ATKINSON - STUART 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.036	121.8	'BELDEN - HARTINGTON 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	137.9	'COLUMBUS - GENOA 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.033	112.8	'EMMET - ONEILL 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.036	124.7	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	113.0	'LOUP CITY - NORTH LOUP 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	119.2	'NELIGH - PETERSBRG.N7115.00 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	167.5	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	118.2	'UTICA JCT - VFODNES 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.034	118.7	'FT RANDAL - UTICA JCT 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.037	120.7	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.034	118.6	'RASMUSN - UTICA JCT 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.034	118.2	'RASMUSN - SIOUX CITY 230KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	133.2	'ALBION - PETERSBURG 115KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	135.5	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	118.2	'DIXONCO 230.00 - HOSKINS 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	106.5	'DIXONCO 230.00 - TWIN CHURCH 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	109.5	'AINSWORTH - STUART 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	135.9	'ALBION - GENOA 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	165.3	'ALBION - PETERSBURG 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	110.2	'ATKINSON - EMMET 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	109.8	'ATKINSON - STUART 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	118.6	'BELDEN - HARTINGTON 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	130.2	'COLUMBUS - GENOA 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	110.4	'EMMET - ONEILL 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	123.1	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	107.3	'LOUP CITY - NORTH LOUP 115KV CKT 1'

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	117.7	'NELIGH - PETERSBRG.N7115.00 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	166.0	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	115.7	'UTICA JCT - VFODNES 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.034	116.5	'FT RANDAL - UTICA JCT 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.037	118.6	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.034	116.1	'RASMUSN - UTICA JCT 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	112.7	'RAUN - SIOUX CITY 345KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.033	112.8	'LN-1267': AINSWORTH-STUART 115 KV + STUART-ATKINSON 115 KV + ATKINSON-EMMET 115 KV + EMMET-ONEILL 115 KV
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.039	138.1	'WAPA-OG-1': FT THOMPSON-FT RANDALL 230KV CKTS 1 & 2 + COLUMBUS-GENOA 115KV'
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.036	122.6	'DAK02WAPAB2': DISCONNECT UTICA JUNCTION
15G	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.036	123.6	'NEB02WAPAB2': DISCONNECT HARTINGTON
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	110.0	'RAUN - SIOUX CITY 345KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.038	130.8	'WAPA-OG-1': FT THOMPSON-FT RANDALL 230KV CKTS 1 & 2 + COLUMBUS-GENOA 115KV'
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.036	119.6	'DAK02WAPAB2': DISCONNECT UTICA JUNCTION
15WP	09ALL	G14_031	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	121.7	'NEB02WAPAB2': DISCONNECT HARTINGTON
15G	09ALL	G14_031	'FROM->TO'	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'	193	193	0.044	100.4	'ALBION - PETERSBURG 115KV CKT 1'
15G	09ALL	G14_031	'FROM->TO'	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'	193	193	0.044	100.7	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	121.3	'DIXONCO 230.00 - HOSKINS 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	109.5	'DIXONCO 230.00 - TWIN CHURCH 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.033	113.0	'AINSWORTH - STUART 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	141.0	'ALBION - GENOA 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	167.8	'ALBION - PETERSBURG 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	119.2	'ALBION - SPALDING 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.033	113.4	'ATKINSON - EMMET 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.033	113.1	'ATKINSON - STUART 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.036	122.4	'BELDEN - HARTINGTON 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	138.6	'COLUMBUS - GENOA 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.033	113.5	'EMMET - ONEILL 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.036	125.3	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	113.7	'LOUP CITY - NORTH LOUP 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	119.8	'NELIGH - PETERSBRG.N7115.00 115KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	168.1	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	113.7	'SIOUX CITY - TWIN CHURCH 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	118.9	'UTICA JCT - VFODNES 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	119.3	'FT RANDAL - UTICA JCT 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.037	121.3	'FT RANDAL - SIOUX CITY 230KV CKT 1'

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	119.3	'RASMUSN - UTICA JCT 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	118.9	'RASMUSN - SIOUX CITY 230KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	138.6	'ALBION - PETERSBURG 115KV CKT 1'
15SP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	140.9	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	118.7	'DIXONCO 230.00 - HOSKINS 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	107.1	'DIXONCO 230.00 - TWIN CHURCH 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	110.1	'AINSWORTH - STUART 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	136.5	'ALBION - GENOA 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	165.9	'ALBION - PETERSBURG 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	110.8	'ATKINSON - EMMET 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	110.4	'ATKINSON - STUART 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	119.2	'BELDEN - HARTINGTON 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	130.8	'COLUMBUS - GENOA 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	111.0	'EMMET - ONEILL 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	123.7	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	107.9	'LOUP CITY - NORTH LOUP 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	118.3	'NELIGH - PETERSBRG.N7115.00 115KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	166.6	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	116.3	'UTICA JCT - VFODNES 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	117.1	'FT RANDAL - UTICA JCT 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.037	119.2	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	116.6	'RASMUSN - UTICA JCT 230KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	116.1	'RASMUSN - SIOUX CITY 230KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	113.4	'RAUN - SIOUX CITY 345KV CKT 1'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.033	113.5	'LN-1267': AINSWORTH-STUART 115 KV + STUART-ATKINSON 115 KV + ATKINSON-EMMET 115 KV + EMMET-ONEILL 115 KV
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.039	138.8	'WAPA-OG-1': FT THOMPSON-FT RANDALL 230KV CKTS 1 & 2 + COLUMBUS-GENOA 115KV'
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.036	123.2	'DAK02WAPAB2': DISCONNECT UTICA JUNCTION
15G	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.036	124.3	'NEB02WAPAB2': DISCONNECT HARTINGTON
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	110.6	'RAUN - SIOUX CITY 345KV CKT 1'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	111.1	'LN-1267': AINSWORTH-STUART 115 KV + STUART-ATKINSON 115 KV + ATKINSON-EMMET 115 KV + EMMET-ONEILL 115 KV
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.038	131.4	'WAPA-OG-1': FT THOMPSON-FT RANDALL 230KV CKTS 1 & 2 + COLUMBUS-GENOA 115KV'
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.036	120.2	'DAK02WAPAB2': DISCONNECT UTICA JUNCTION
15WP	09ALL	G14_031	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	122.3	'NEB02WAPAB2': DISCONNECT HARTINGTON
15SP	09ALL	G14_031	'FROM->TO'	'FT RANDAL - UTICA JCT 230KV CKT 1'	320	320	0.336	104.7	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15WP	09ALL	G14_031	'FROM->TO'	'FT RANDAL - UTICA JCT 230KV CKT 1'	320	320	0.336	99.6	'FT RANDAL - SIOUX CITY 230KV CKT 1'

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15G	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	128.3	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15G	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	126.3	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15G	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	128.5	'COUNTY LINE - NELIGH 115KV CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.032	101.3	'AINSWORTH - STUART 115KV CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	128.8	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	119.0	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	130.8	'COUNTY LINE - NELIGH 115KV CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.032	106.7	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.036	107.0	'HOSKINS - SHELL CREEK 345KV CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.035	108.7	'FT THOMPSON - GRAND ISLAND 345KV CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.033	105.6	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.030	105.7	'GAVINS POINT - SPIRIT MOUND 115KV CKT 1'
15WP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	130.7	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15WP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	125.8	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15WP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	130.8	'COUNTY LINE - NELIGH 115KV CKT 1'
15G	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	128.5	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.031	101.2	'HOSKINS (HOSKN T4) 345/115/13.8KV TRANSFORMER CKT 1'
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	131.0	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV
15SP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.032	107.4	'NEB02WAPAB2': DISCONNECT HARTINGTON
15WP	09ALL	G14_031	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	130.9	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV
15G	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	127.7	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	125.7	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	127.9	'COUNTY LINE - NELIGH 115KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	125.2	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	115.3	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	127.1	'COUNTY LINE - NELIGH 115KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.032	103.1	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.036	103.4	'HOSKINS - SHELL CREEK 345KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.035	105.1	'FT THOMPSON - GRAND ISLAND 345KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.033	102.0	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.030	102.2	'GAVINS POINT - SPIRIT MOUND 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	129.4	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	124.5	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	129.5	'COUNTY LINE - NELIGH 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	127.9	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	127.3	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV
15SP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.032	103.8	'NEB02WAPAB2': DISCONNECT HARTINGTON
15WP	09ALL	G14_032	'TO->FROM'	'ALBION - PETERSBURG 115KV CKT 1'	137	137	0.041	129.6	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	120.6	'DIXONCO 230.00 - HOSKINS 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	108.8	'DIXONCO 230.00 - TWIN CHURCH 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.033	112.3	'AINSWORTH - STUART 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	140.3	'ALBION - GENOA 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	167.1	'ALBION - PETERSBURG 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	118.5	'ALBION - SPALDING 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.033	112.7	'ATKINSON - EMMET 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.033	112.4	'ATKINSON - STUART 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.036	121.8	'BELDEN - HARTINGTON 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	137.9	'COLUMBUS - GENOA 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.033	112.8	'EMMET - ONEILL 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.036	124.7	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	113.0	'LOUP CITY - NORTH LOUP 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	119.2	'NELIGH - PETERSBRG.N7115.00 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	167.5	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	118.2	'UTICA JCT - VFODNES 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.034	118.7	'FT RANDAL - UTICA JCT 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.037	120.7	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.034	118.6	'RASMUSN - UTICA JCT 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.034	118.2	'RASMUSN - SIOUX CITY 230KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	133.2	'ALBION - PETERSBURG 115KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	135.5	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	118.2	'DIXONCO 230.00 - HOSKINS 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	106.5	'DIXONCO 230.00 - TWIN CHURCH 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	109.5	'AINSWORTH - STUART 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	135.9	'ALBION - GENOA 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	165.3	'ALBION - PETERSBURG 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	110.2	'ATKINSON - EMMET 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	109.8	'ATKINSON - STUART 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	118.6	'BELDEN - HARTINGTON 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	130.2	'COLUMBUS - GENOA 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	110.4	'EMMET - ONEILL 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	123.1	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	107.3	'LOUP CITY - NORTH LOUP 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	117.7	'NELIGH - PETERSBRG.N7115.00 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.044	166.0	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	115.7	'UTICA JCT - VFODNES 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.034	116.5	'FT RANDAL - UTICA JCT 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.037	118.6	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.034	116.1	'RASMUSN - UTICA JCT 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.032	112.7	'RAUN - SIOUX CITY 345KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.033	112.8	'LN-1267': AINSWORTH-STUART 115 KV + STUART-ATKINSON 115 KV + ATKINSON-EMMET 115 KV + EMMET-ONEILL 115 KV
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.039	138.1	'WAPA-OG-1': FT THOMPSON-FT RANDALL 230KV CKTS 1 & 2 + COLUMBUS-GENOA 115KV'
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.036	122.6	'DAK02WAPAB2': DISCONNECT UTICA JUNCTION
15G	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.036	123.6	'NEB02WAPAB2': DISCONNECT HARTINGTON
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.031	110.0	'RAUN - SIOUX CITY 345KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.038	130.8	'WAPA-OG-1': FT THOMPSON-FT RANDALL 230KV CKTS 1 & 2 + COLUMBUS-GENOA 115KV'
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.036	119.6	'DAK02WAPAB2': DISCONNECT UTICA JUNCTION
15WP	09ALL	G14_032	'TO->FROM'	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'	120	120	0.035	121.7	'NEB02WAPAB2': DISCONNECT HARTINGTON
15G	09ALL	G14_032	'FROM->TO'	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'	193	193	0.044	100.4	'ALBION - PETERSBURG 115KV CKT 1'
15G	09ALL	G14_032	'FROM->TO'	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'	193	193	0.044	100.7	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	121.3	'DIXONCO 230.00 - HOSKINS 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	109.5	'DIXONCO 230.00 - TWIN CHURCH 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.033	113.0	'AINSWORTH - STUART 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	141.0	'ALBION - GENOA 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	167.8	'ALBION - PETERSBURG 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	119.2	'ALBION - SPALDING 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.033	113.4	'ATKINSON - EMMET 115KV CKT 1'

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.033	113.1	'ATKINSON - STUART 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.036	122.4	'BELDEN - HARTINGTON 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	138.6	'COLUMBUS - GENOA 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.033	113.5	'EMMET - ONEILL 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.036	125.3	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	113.7	'LOUP CITY - NORTH LOUP 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	119.8	'NELIGH - PETERSBRG.N7115.00 115KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	168.1	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	113.7	'SIOUX CITY - TWIN CHURCH 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	118.9	'UTICA JCT - VFODNES 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	119.3	'FT RANDAL - UTICA JCT 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.037	121.3	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	119.3	'RASMUSN - UTICA JCT 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	118.9	'RASMUSN - SIOUX CITY 230KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	138.6	'ALBION - PETERSBURG 115KV CKT 1'
15SP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	140.9	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	118.7	'DIXONCO 230.00 - HOSKINS 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	107.1	'DIXONCO 230.00 - TWIN CHURCH 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	110.1	'AINSWORTH - STUART 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	136.5	'ALBION - GENOA 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	165.9	'ALBION - PETERSBURG 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	110.8	'ATKINSON - EMMET 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	110.4	'ATKINSON - STUART 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	119.2	'BELDEN - HARTINGTON 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	130.8	'COLUMBUS - GENOA 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	111.0	'EMMET - ONEILL 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	123.7	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	107.9	'LOUP CITY - NORTH LOUP 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	118.3	'NELIGH - PETERSBRG.N7115.00 115KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.044	166.6	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	116.3	'UTICA JCT - VFODNES 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	117.1	'FT RANDAL - UTICA JCT 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.037	119.2	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	116.6	'RASMUSN - UTICA JCT 230KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.034	116.1	'RASMUSN - SIOUX CITY 230KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	113.4	'RAUN - SIOUX CITY 345KV CKT 1'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.033	113.5	'LN-1267': AINSWORTH-STUART 115 KV + STUART-ATKINSON 115 KV + ATKINSON-EMMET 115 KV + EMMET-ONEILL 115 KV

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.039	138.8	'WAPA-OG-1': FT THOMPSON-FT RANDALL 230KV CKTS 1 & 2 + COLUMBUS-GENOA 115KV'
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.036	123.2	'DAK02WAPAB2': DISCONNECT UTICA JUNCTION
15G	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.036	124.3	'NEB02WAPAB2': DISCONNECT HARTINGTON
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.031	110.6	'RAUN - SIOUX CITY 345KV CKT 1'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.032	111.1	'LN-1267': AINSWORTH-STUART 115 KV + STUART-ATKINSON 115 KV + ATKINSON-EMMET 115 KV + EMMET-ONEILL 115 KV
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.038	131.4	'WAPA-OG-1': FT THOMPSON-FT RANDALL 230KV CKTS 1 & 2 + COLUMBUS-GENOA 115KV'
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.036	120.2	'DAK02WAPAB2': DISCONNECT UTICA JUNCTION
15WP	09ALL	G14_032	'TO->FROM'	'COUNTY LINE - NELIGH 115KV CKT 1'	120	120	0.035	122.3	'NEB02WAPAB2': DISCONNECT HARTINGTON: DISCONNECT HARTINGTON
15SP	09ALL	G14_032	'FROM->TO'	'FT RANDAL - UTICA JCT 230KV CKT 1'	320	320	0.336	104.7	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15WP	09ALL	G14_032	'FROM->TO'	'FT RANDAL - UTICA JCT 230KV CKT 1'	320	320	0.336	99.6	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15G	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	128.3	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15G	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	126.3	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15G	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	128.5	'COUNTY LINE - NELIGH 115KV CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.032	101.3	'AINSWORTH - STUART 115KV CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	128.8	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	119.0	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	130.8	'COUNTY LINE - NELIGH 115KV CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.032	106.7	'GAVINS POINT - HARTINGTON 115KV CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.036	107.0	'HOSKINS - SHELL CREEK 345KV CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.035	108.7	'FT THOMPSON - GRAND ISLAND 345KV CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.033	105.6	'FT RANDAL - SIOUX CITY 230KV CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.030	105.7	'GAVINS POINT - SPIRIT MOUND 115KV CKT 1'
15WP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	130.7	'BATTLE CREEK - COUNTY LINE 115KV CKT 1'
15WP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	125.8	'BATTLE CREEK - NORTH NORFOLK 115KV CKT 1'
15WP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	130.8	'COUNTY LINE - NELIGH 115KV CKT 1'

Power Flow Analysis

Season	Dispatch Group	Source	Flow	Monitored Element	RATEA (MVA)	RATEB (MVA)	TDF	TC% LOADING	Contingency
15G	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	128.5	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.031	101.2	'HOSKINS (HOSKN T4) 345/115/13.8KV TRANSFORMER CKT 1'
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	131.0	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV
15SP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.032	107.4	'NEB02WAPAB2': DISCONNECT HARTINGTON: DISCONNECT HARTINGTON
15WP	09ALL	G14_032	'FROM->TO'	'PETERSBRG.N7115.00 - PETERSBURG 115KV CKT Z1'	137	137	0.041	130.9	'LN-1163': NELIGH-COUNTY LINE 115 KV + COUNTY LINE-BATTLE CREEK 115 KV + BATTLE CREEK-NORTH NORFOLK 115 KV

Stability Analysis

Transient stability analysis was not performed for this IAISIS study. The results from DISIS 2014-002 or most recent iteration remain valid.

Conclusion

<OMITTED TEXT> Interconnection Customers requested an IAISIS under Section 11A of Attachment V to the Southwest Power Pool OATT for GIRs GEN-2014-031 and GEN-2014-032. Although both GIRs requested both ERIS and NRIS into NPPD Transmission System, only ERIS is allowed under an Interim GIA. GEN-2014-031 and GEN-2014-032 have requested this IAISIS to determine the impacts of interconnecting to the transmission system before all required Network Upgrades identified in the DISIS-2014-002 (or most recent iteration) Impact Study can be placed into service. Eligibility for Interim Interconnection Service is governed by Section 11A.2 of the GIP.

GEN-2014-031 is a 35.8 MW wind generating facility and requested an updated In-Service Date of December 1, 2015. GEN-2014-032 is a 10.2 MW uprate to an existing wind generating facility (GEN-2008-086N02) and requested an updated In-Service Date of September 1, 2015. The IAISIS 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 IAISIS may need to be restudied to ensure that interconnection service remains for the Interconnection Customers' request.

Power flow analysis from this IAISIS determined that GEN-2014-031 for 35.8MW and GEN-2014-032 for 10.2MW can interconnect their respective amounts of generation in the interim an Energy Resource prior to the completion of the required Network Upgrades, listed within Table 2 of this report. 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 interim Interconnection service remains available. Refer to Tables 4, 6, 7 and 8 for the Interim Interconnection Service available due to interconnection constraints. Additionally, Tables 5 and 9-11 show additional constraints that may require curtailment of generation to relieve system overloads.

Transient stability analysis was not performed for this study. The results from DISIS 2014-002 or most recent iteration remain valid.

For the Interconnection Request(s) to move forward into Interim Interconnection Service, the Interconnection Customer will be required to execute an Interim Generator Interconnection Agreement (IGIA). If the Interconnection Facilities Study can be completed prior to the execution of the IGIA, then customer may proceed to executing a final GIA and this study may be used for the purpose of a Limited Operation Impact Study under Article 5.9 of the pro-forma GIA.

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 IAISIS 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.