

Avery Substation Interconnection Study Report

2017 Summer (ISD)

Prepared by
Platte River Power Authority

August 26, 2014

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I. Executive Summary

The interconnection of the Avery Substation and associated load has no significant adverse impacts to the PRPA system or Foothills Area Transmission System (Foothills System). All assessed interconnection scenarios are acceptable to PRPA. No system upgrades are required for this interconnection beyond the facilities necessary to complete the interconnection.

The TOT 7 transfer capability decreases up to 26 MW depending on the additional amount of transmission that is installed and where the transmission is looped into the current system for the Avery Substation Interconnection.

II. Purpose

The purpose of this study is to assess the PRPA and Foothills Systems and the TOT 7 transfer capability for impacts resulting from an interconnection of the Avery Substation. The interconnection will loop Avery into PRPA's 230kV transmission at a location on the Ault - Carey - Timberline line sections. Performance levels will be evaluated to ensure system reliability according to NERC Standards TPL-001 through -003, and if necessary, system upgrades were identified as additional requirements to the interconnection.

III. Foothills Planning Group

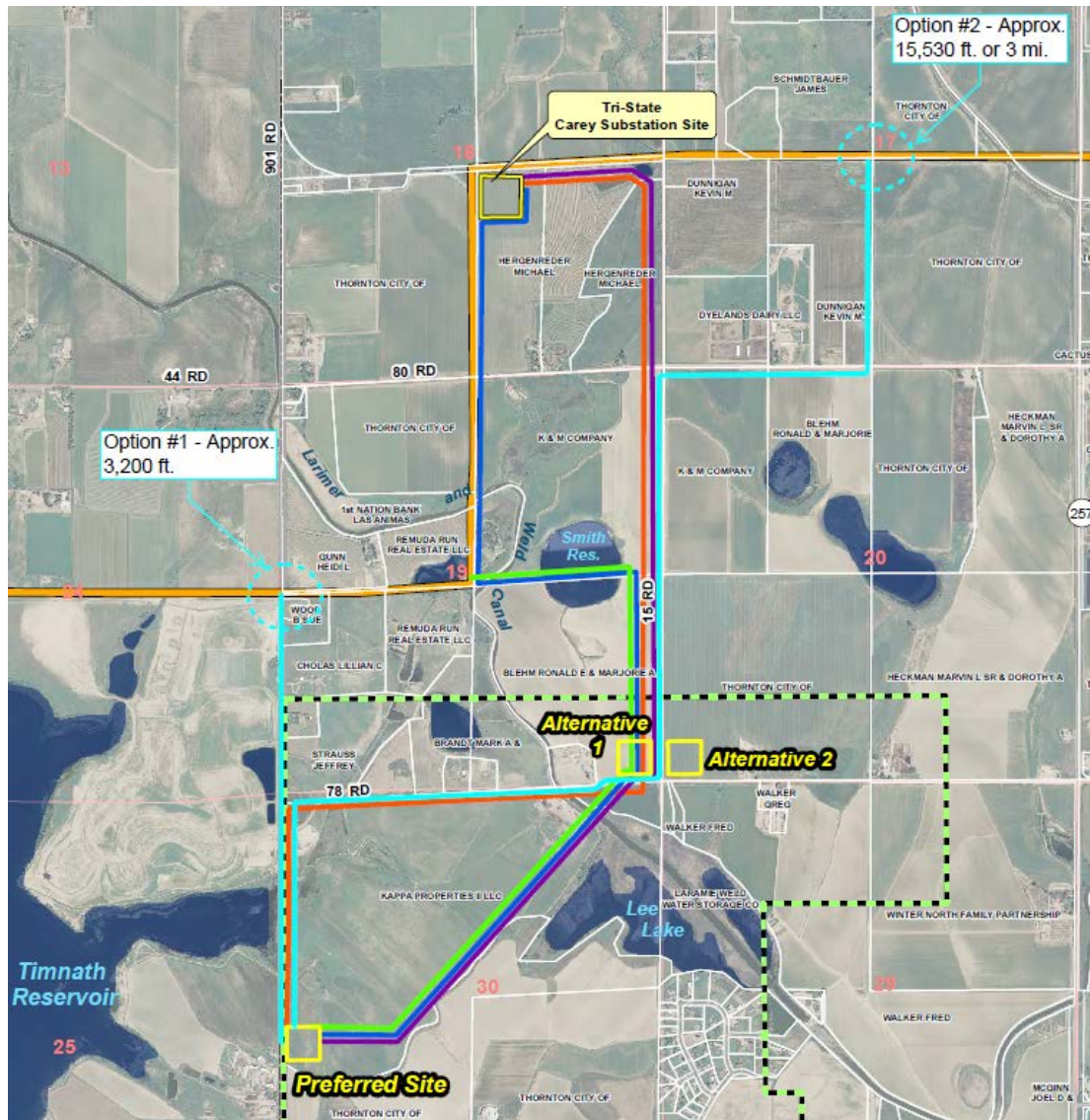
The Foothills Planning Group (FPG) consists of representatives from Platte River Power Authority (PRPA), Tri-State Generation & Transmission (TSGT), Western Area Power Administration - Rocky Mountain Regional Office (WAPA-RMR) and Xcel Energy/Public Service Company of Colorado (PSCo).

IV. Scope

The study area is the Foothills System located in northern Colorado as shown in [Exhibit 1](#). The PRPA transmission system is situated in the Foothills System with members of the FPG.

The loads in the study area are represented in Zones 754 and 706 of the WECC power flow case. See [Exhibit 2](#) for a list of all loads in the study area.

The preferred location of the new Avery 230 kV Substation is approximately halfway between Weld County Roads 74 & 76 on the East side of Larimer/Weld County Line Road 13. Alternate locations are at the Northeast corner of the intersection of Weld County Road 15 & 78. There are several proposed routes to all of these alternate locations as outlined in the following diagram:



The longest transmission line additions to PRPA’s system, either on Ault – Carey or Carey – Timberline 230kV lines (denoted above in orange), will have more of a system impact relative to the proposed shorter transmission line addition alternatives on these line sections. The possible alternatives suggested above vary between adding 0.6-2.0 miles of double circuit transmission line to the Carey – Timberline 230kV Line or 2.0-3.0 miles of double circuit transmission line to the Ault – Carey 230kV Line. Proposed alternatives in which originate out of the TSGT Carey Substation will have negligible system impact. The following scenarios will be evaluated to encompass all proposed alternatives:

- Scenario 1: The aqua route¹ to the South of PRPA’s Carey – Timberline 230kV line.
- Scenario 2: The green route to the East of PRPA’s Carey – Timberline 230kV line.
- Scenario 3: The aqua route² to the South of PRPA’s Ault – Carey 230kV line.

The modeling specifications to be used in assessing the system impact of each scenario can be found in [Exhibit 3](#).

¹ Route is labeled as “Option #1” in diagram above.

² Route is labeled as “Option #2” in diagram above.

The TOT 7 path is a 230 kV transmission corridor on the eastern side of the Foothills System between Ault and Fort St. Vrain (FSV). The existing TOT 7 path provides one path for power transfers into the northern metro Denver area and is also known as Path 40 in the WECC Path Rating Catalog. The Ault – Carey and Carey – Timberline 230kV lines historically impact the TOT 7 transfer path limits. The study of Avery Project scenarios will determine the system impact on TOT 7. See [Exhibit 4](#) for a diagram of the TOT 7 path.

V. Assessment Studies

Powerflow analyses for System Intact initial conditions will be performed at 2018 forecasted peak summer load with Colorado Big Thompson (CBT) generation at 90MW. TOT 7 flows will be adjusted to determine the Avery Project impact on TOT 7 limits. The results documented herein are subject to the various contingency conditions defined in the NERC Standards TPL-001 through -004 for Categories A, B, C, and D.

VI. Base Case

The study base case “18HS_PRPA_Avery.sav” reflects the system topology and load forecast for the 2018 summer peak demand period as reviewed and updated with changes from the FPG and the Colorado Coordinated Planning Group (CCPG).³

VII. Assumptions

1. Loads are represented at the high-voltage busses.
2. PRPA detailed representation with substation transformers and low-voltage bus loads are not used in this study. However, power factors have been adjusted for high-voltage bus representation.
3. Voltage criteria violations on the transmission system are of more concern at load busses than at non-load busses.

VIII. Criteria

PRPA adheres to NERC Transmission Planning Standards and WECC Reliability Criteria, as well as internal company criteria for planning studies. PRPA’s power flow simulation criteria:

Category A – System Normal

“N-0” System Performance Under Normal (No Contingency) Conditions (Category A)

NERC Standard TPL-001-0

Voltage:	0.95 to 1.05 per unit
Line Loading:	100 percent of continuous rating
Transformer Loading:	100% of highest 65 °C rating

Category B – Loss of generator, line, or transformer (Forced Outage)

“N-1” System Performance Following Loss of a Single Element (Category B)

NERC Standard TPL-002-0

³ 18HS_PRPA_Avery.sav study base case was developed from the study base case, ccpg_2018HS_R2.sav, which was developed and reviewed by the FPG and CCPG parties from the 2017 HS1A approved WECC base case posted on 1/18/2012. Modifications made to the ccpg_2018HS_R2.sav case are documented in [Exhibit 5](#).

Voltage:	0.92 to 1.10 per unit (PRPA) 0.90 to 1.10 per unit (all others)
Line Loading:	100 percent of continuous rating or emergency rating if applicable
Transformer Loading:	100% of highest 65 °C rating

Category C – Loss of Bus or a Breaker Failure (Forced Outage)

“N-2 or More” System Performance Following Loss of Two or More Elements (Category C)
NERC Standard TPL-003-0

Voltage and Thermal:	Allowable emergency limits will be considered as determined by the affected parties and the available emergency mitigation plan. Curtailment of firm transfers, generation redispatch, and load shedding will be considered if necessary.
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Category D – Extreme Events (Forced Outages)

“N-2 or More” System Performance Following Extreme Events (Category D)
NERC Standard TPL-004-0

Voltage and Thermal:	Evaluate for risks and consequences. If applicable, use allowable emergency limits as determined by available emergency mitigation plan. Curtailment of firm transfers, generation redispatch, and load shedding will be considered if necessary.
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IX. Procedure

1. Stress TOT 7 by increasing generation north of TOT 3, and decreasing generation south of FSV.
2. Run Category A conditions, all Category B contingencies, and certain Category C contingencies for zones 706 and 754 using the matrix routine written for contingency analysis.
3. Find the TOT7 limit for the benchmark case and for each interconnection scenario case described in the Scope section.
4. Assess study results for system impact according to the performance criteria.
5. Consider transient stability studies if generation is added or if impedance changes are made to lines exiting the Rawhide plant.

Solution methods will be as follows:

	<u>Pre-contingency</u>	<u>Post-Contingency</u>
Area Interchange Control	Off	Off
Phase-Shifter	Adjust	Lock
TFMR LTC	Adjust	Adjust
Switched Shunt Reactor/Capacitor	Adjust	Lock (unless automatic in field)
DC Taps	Adjust	Adjust

See [Exhibit 6](#) for a description of the study procedure. See [Exhibit 7](#) for the busses and branches monitored for criteria violations, and [Exhibit 8](#) for the forced outage contingencies.

X. Results

See the following table for system impacts caused by the different Avery Project Scenarios:

2018HS Avery Substation Interconnection	Transmission added to current system (miles)	System Overload Impacts (%)
Benchmark	N/A	106.3
Scenario #1	1.22 to CRY-TP	107.2
Scenario #2	3.84 to CRY-TP	108.2
Scenario #3	5.88 to AU-CRY	108.0

The loss of the College Lake - Rawhide - Timberline 3-terminal and Rawhide - Timberline 230kV lines caused by a circuit breaker 1186 failure at Timberline Substation causes the Laporte 230/115kV Transformer to overload a 184 MVA continuous facility rating. The Laporte 230/115kV Transformer has a 1-hour emergency facility rating of 239 MVA. PRPA's 10-year transmission plan has a Laporte Expansion project to mitigate this system exposure.

Additional system exposure on the Henry Lake 230/115kV Transformer and in the Boyd-Weld-Greeley Area was observed but was determined not to have been caused by the Avery Project.

Operationally, TOT 7 limits are defined using emergency facility ratings, where typically in planning assessments, continuous facility ratings are used in the analysis. For each scenario the 890 MW TOT 7 path rating was verified⁴ utilizing emergency facility ratings. In the following table below, continuous facility ratings were used to assess the impact on the transfer path caused by the Avery Project.

⁴ TOT7 890 path rating was verified based on unique stressing of system conditions and the Ault circuit breaker #2186 failure causing the simultaneous loss of FSV (loss of tapped Windsor Substation) and Carey/Avery 230kV lines loading FSV-Weld 230kV line to its 30-minute 574 MVA emergency rating.

2018HS Avery Substation Interconnection	Transmission added to current system (miles)	TOT7 Limit (MW) ⁵ based on continuous facility ratings	TOT7 Impact (MW/%) based on continuous facility ratings	TOT7 Limit (MW) based on emergency facility ratings
Benchmark	N/A	517	N/A	703 ⁶
Scenario #1	1.22 to CRY-TP	501	-16/3.0	708
Scenario #2	3.84 to CRY-TP	492	-25/4.8	708
Scenario #3	5.88 to AU-CRY	492	-25/4.8	708

The study analysis shows the use of emergency TOT7 facility ratings preserves a significant amount of capacity on the transfer path. From a TOT7 perspective, the Avery Project positively changes the system TOT7 flows when the TOT7 limits are based on emergency TOT7 facility ratings. Since the Avery Project is on the West of the TOT7 limiting contingency in each of the scenario cases, it has no impact on the TOT7 limit when using TOT7 emergency facility ratings. Therefore the TOT7 impact based on continuous facility ratings was determined to be used as the metric to assess impact on the transfer path. In all scenarios, the 890 path rating and the TOT7 limits based on emergency TOT7 facility ratings were both determined by the same limiting contingency and limiting element⁷. This demonstrates the dynamic nature of the TOT7 transfer path in that by using different system stressing techniques, it is possible to achieve more capacity on the transfer path. The matrix study results are documented in [Exhibit 9](#) of this report.

XI. Conclusions

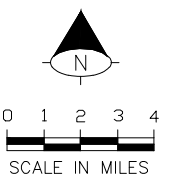
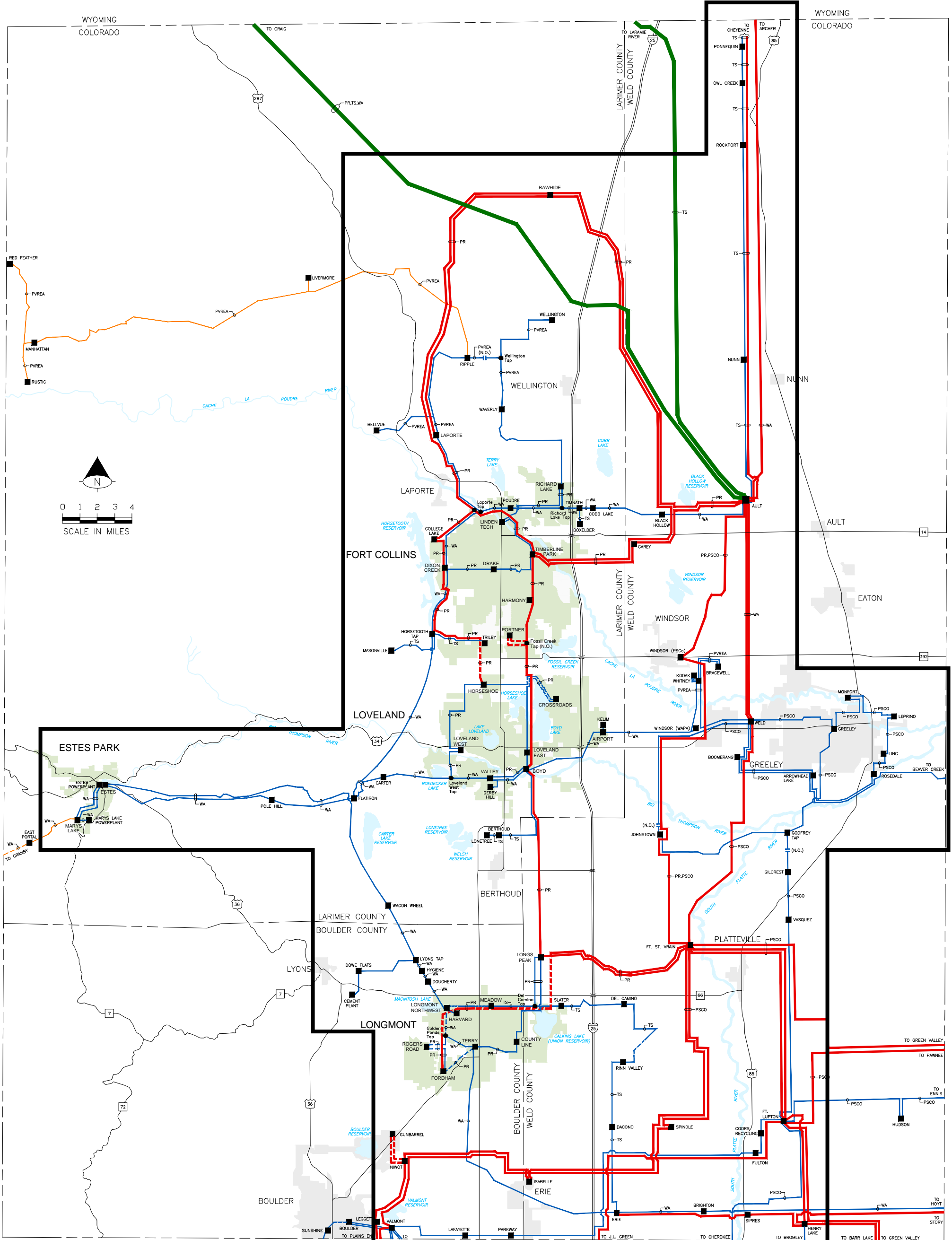
The Avery Substation Interconnection has no significant adverse system impact to the PRPA and Foothills systems. TOT7 Transfer capacity is reduced by up to 25 MW depending on the amount of additional transmission is installed and where the transmission is looped into the current system for the Avery Substation Interconnection. PRPA recommends future system configurations that would increase the system transmission distance from the Avery Substation to Ault, Carey, or Timberline Substations be avoided. At the discretion of the TOT7 members, this study may be performed again if the line length from either the Carey - Timberline loop exceeds 4 miles or the Ault - Carey loop exceeds 6 miles.

⁵ TOT7 limit was based on loss of an Ault-Weld 230kV line loading the other Ault-Weld 230kV line to its 513 MVA continuous rating.

⁶ TOT7 limit was based on the Weld (PSCo) circuit breaker #5221 failure causing the simultaneous loss of Weld (WAPA) 230kv main and transfer Substation and the Weld (PSCo) 230/115kV transformer which loads the Harmony-Portner 230kV line to its 472 MVA continuous rating.

⁷ TOT7 limit was based on the Ault circuit breaker #2186 failure causing the simultaneous loss of FSV (loss of tapped Windsor Substation) and Carey/Avery 230kV lines which loads the FSV-Weld 230kV line to its 30-minute 574 MVA emergency rating.

Exhibit 1



OWNERSHIP LEGEND

- PR PLATTE RIVER POWER AUTHORITY
- PSCO PUBLIC SERVICE COMPANY
- PVREA POUDRE VALLEY RURAL ELECTRIC ASSOCIATION
- TS TRI-STATE GENERATION & TRANSMISSION
- WA WESTERN AREA POWER ADMINISTRATION

LEGEND

- 69KV TRANSMISSION LINE
- 69KV UNDERGROUND TRANSMISSION LINE
- 115KV TRANSMISSION LINE
- 115KV UNDERGROUND TRANSMISSION LINE
- 230KV TRANSMISSION LINE
- 230KV UNDERGROUND TRANSMISSION LINE
- 345KV TRANSMISSION LINE
- SUBSTATION
- TAP WITH SWITCHES

PLATTE RIVER POWER AUTHORITY
2000 E. HORSETOOTH ROAD
FT. COLLINS, COLORADO 80525

**FOOTHILLS AREA
2013 TRANSMISSION SYSTEM**

DATE	REV.	DESCRIPTION	DESIGNED BY: JCC/DJL	DRAWN BY: DJL	CHECKED BY: JCC
2/13	0	ANNUAL UPDATE	APPROVED BY: JCC		DATE: 2/2013
DATE	REV.	DESCRIPTION	SCALE: AS NOTED	DRAWING NO. PRS-01-2013	REV: 0

Exhibit 2

Exhibit 2:

Foothills Loads 2018 Summer Peak

Bus#	Name	kV	ID	MW	MV	Area	Zone	Owner
70350	RAWHIDE	24	SS	23	18	70	706	93
73002	AIRPORT	115	PR	24.6	10.5	73	754	93
73050	DERBYHIL	115	PR	9.9	4.2	73	754	93
73051	DIXON CK	115	PR	56.5	24.1	73	754	93
73052	DRAKE RD	115	PR	52	22.2	73	754	93
73056	ESTES	115	PR	12.2	5.2	73	754	93
73060	FORDHAM	115	PR	70.1	29.9	73	754	93
73078	HARMONY	230	PR	118.6	50.5	73	754	93
73079	HARVARD	115	PR	31	13.2	73	754	93
73086	HORSESHO	115	PR	31.8	13.5	73	754	93
73111	LINDEN	115	PR	63.7	27.1	73	754	93
73118	LOVE E	115	PR	44.7	19	73	754	93
73120	LOVE W	115	PR	31.3	13.3	73	754	93
73133	MEADOW	115	PR	45.9	19.6	73	754	93
73169	RICHARDS	115	PR	19.8	8.4	73	754	93
73196	TERRY	115	PR	58.5	24.9	73	754	93
73198	TIMBERLN	115	PR	30.6	13.1	73	754	93
73232	MARYLKS	115	PR	8.1	3.5	73	754	93
73373	VALLEYLM	115	PR	29.6	12.6	73	754	93
73437	ROGERSRD	115	PR	3.5	1.5	73	754	93
73465	CNTYLINE	115	PR	13.8	5.9	73	754	93
73499	CROSSRDS	115	PR	11.6	4.9	73	754	93
73557	FORTNE	115	PR	5.2	2.2	73	754	93
73604	PORTNER	230	PR	24.3	10.4	73	754	93
50% PRPA Total:				820.3	357.7	pf: 0.92		

Bus#	Name	kV	ID	MW	MV	Area	Zone	Owner
70190	DAVIS	115	TS	1.8	0	70	706	73
70191	FTLUPTON	115	TS	4.3	1.4	70	706	73
70213	GUNBARRE	230	TS	1.5	0.5	70	754	73
70311	PAWNEE	230	TS	4	0	70	706	73
70529	JLGREEN	230	TS	14.3	4.7	70	706	73
70607	BROMLEY	115	TS	40.5	13.3	70	706	73
70820	KEENSBG	230	TS	3.5	0	70	706	73
72107	SLATER_TS	115	TS	11.8	3.9	73	754	73
72201	SIPRES	230	TS	3	1	73	754	73
72404	CAREY_TS	230	TS	11.6	3.8	73	754	73
72407	DOWE FLATS	115	1	1	0	73	754	73
72407	DOWE FLATS	115	TS	3.1	1	73	754	73
73002	AIRPORT	115	TS	10.5	3.5	73	754	73
73024	BLKHLWTP	115	TS	3.3	1.1	73	754	73
73030	BRIGHTNW	115	TS	8.9	2.9	73	754	73
73039	CARTERLK	115	TS	3.5	1	73	754	73
73049	DELCAMIN	115	TS	10.1	3.3	73	754	73
73050	DERBYHIL	115	TS	3.1	0.8	73	754	73
73090	HYGIENE	115	TS	3.3	0.5	73	754	73
73098	KODAK	115	TS	23.5	7.7	73	754	73
73105	LAPORTE	115	TS	11.4	3.7	73	754	73
73114	LONETREE	115	TS	9	3	73	754	73
73145	NUNN	115	TS	1.9	0.6	73	754	73
73156	POUDRE	115	TS	3.9	1.3	73	754	73
73171	ROCKMTCM	115	TS	11.8	3.9	73	754	73
73172	ROCKPRTP	115	TS	1.6	0.5	73	754	73
73203	TRILBY	115	TS	9.2	3	73	754	73
73218	WINDSOR	115	TS	11.5	1.2	73	754	73
73235	MASONVIL	115	TS	3.9	1.3	73	754	73
73468	WELL TP	115	TS	5.1	0	73	754	73
73469	WAVER PV	115	TS	8.2	0	73	754	73
73501	RINNVALL	115	TS	34.1	11.2	73	754	73
73502	DACONO	115	TS	28.3	8.2	73	754	73
73553	BOXELDER	115	TS	5.4	1.8	73	754	73
73555	BRACEWLL	115	TS	10.2	3.3	73	754	73
73556	WAGONWHL	115	TS	5.2	1.7	73	754	73
73597	OWL_CRK	115	TS	24.7	7.2	73	754	73
21% TSGT Total:				352.0	102.3	pf: 0.96		

Bus#	Name	kV	ID	MW	MV	Area	Zone	Owner
70290	MONFORT	115	IN	14	11.33	70	706	65
70008	KELIM	115	P1	9.26	4.22	70	706	65
70198	GILCREST	115	P1	7.93	0.74	70	706	65
70210	GREELEY1	46	P1	4.47	-0.69	70	706	65
70240	JOHNSTN	115	P1	6.24	0.62	70	706	65
70290	MONFORT	115	P1	36.88	0.47	70	706	65
70368	ROSEDALE	115	P1	22.11	5.49	70	706	65
70474	WINDSOR	230	P1	17.96	8.96	70	706	65
70475	ARROWHLK	115	P1	32.82	16.97	70	706	65
70534	BERTHOUD	115	P1	9.37	0.66	70	754	65
73105	LAPORTE	115	P1	4.82	2.91	73	754	65
70210	GREELEY1	46	P2	4.47	3.56	70	706	65
70246	JOHNSTN2	115	P2	17.03	7.8	70	706	65
70368	ROSEDALE	115	P2	20.23	11.73	70	706	65
70397	B.CRK_PS	115	P2	13.4	-2.35	70	706	65
70469	WELD	46	P2	30.15	-0.42	70	706	65
70474	WINDSOR	230	P2	9.67	2.06	70	706	65
70209	GREELEY	115	P3	39.06	12.15	70	706	65
70209	GREELEY	115	P4	34.86	16.97	70	706	65
70471	WELD_PS	230	P4	35.1	11.66	70	706	65
70397	B.CRK_PS	115	P5	0.66	-0.15	70	706	65
70471	WELD_PS	230	P5	4.22	1.25	70	706	65
73086	HORSESHO	115	PS	4.55	1.5	73	754	65
73118	LOVE E	115	PS	0.21	0.07	73	754	65
73120	LOVE W	115	PS	2.03	0.67	73	754	65
73470	COLLEGLK	230	PS	13.08	4.3	73	754	65
73499	CROSSRDS	115	PS	0.71	0.23	73	754	65
70310	PAWNEE	22	SS	31	25.6	70	706	65
70314	MANCHEF1	16	SS	0.75	0.56	70	706	65
70315	MANCHEF2	16	SS	0.75	0.56	70	706	65
70406	ST.VR_2	18	SS	4	3.4	70	706	65
70407	ST.VR_3	18	SS	4	3.4	70	706	65
70408	ST.VR_4	18	SS	4	3.4	70	706	65
70409	ST.VRAIN	22	SS	8	6.7	70	706	65
70487	JMSHAFR2	13.8	SS	0.7	0.2	70	706	65
70490	JMSHAFR1	13.8	SS	0.7	0.2	70	706	65
70493	QF_TI-T2	13.8	SS	0.7	0.2	70	706	65
70495	QF_TI-T1	13.8	SS	0.7	0.2	70	706	65
70499	QF_B4-4T	13.8	SS	0.3	0.23	70	706	65
70500	QF_CPP1T	13.8	SS	0.33	0.25	70	706	65
70501	QF_CPP3T	13.8	SS	0.17	0.12	70	706	65
70556	QF_B4D4T	12.5	SS	0.55	0.41	70	706	65
70822	CEDARCK1	34.5	SS	5	3.75	70	706	65
70950	ST.VR_5	18	SS	3	2.5	70	706	65
70951	ST.VR_6	18	SS	3	2.5	70	706	65
28% PSCo Total:				462.9	176.9	pf: 0.93		

73155	POLEHILL	115	SS	0.31	0.15	73	754	26
73306	ESTES1	6.9	WA	0.75	0.25	73	754	26
73050	DERBYHIL	115	MU	2.6	0.8	73	754	93
73127	LYONS	115	MU	2.8	0.92	73	754	67
Foothills Area Total:				1641.7	639.0	pf: 0.93		

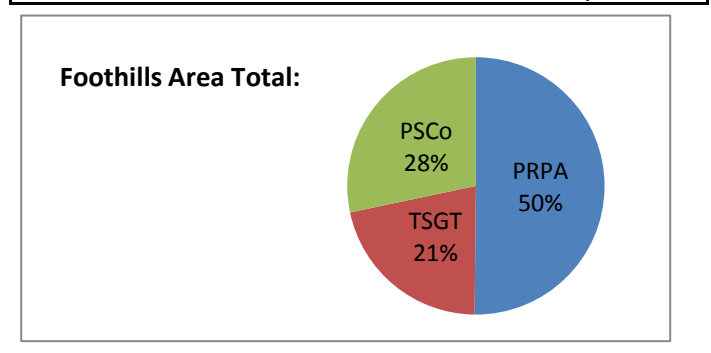


Exhibit 3

Avery2012-2021 Xcel Load Forecast-PRPA-peak2-26-2012.xls
Xcel Energy request confidential treatment of the Non-Public document

2012 Forecast for the Xcel loads in PRPA control area															
		Contracted Capacity			kW by Year										
	BankID	kW	Win to Sum	Peaking Season	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Avery (aka Carey-Timnath) Sub	AVERY_NO-1			S	0	13,999	14,650	15,300	15,951	16,602	17,294	17,972	18,650	19,000	19,300
			0.77	W	0	10,499	10,987	11,475	11,964	12,452	12,971	13,479	13,988	14,250	14,475

Notes: (1) Forecast values derived from PSCo distribution forecasts and SCADA winter/summer non-coincident peak values.

(2) Adjustment for Low-Side Metering (% losses in Xfmr) are not included in the kW & kVA values indicated in this table.

Note: ISD of Avery (Carey-Timnath) Sub is 6/1/2017.

Note: Revised on June 18, 2012.



November 25, 2013
By: Jeremy Brownrigg

Calculations for Avery Project Scenario 1:

Carey - Timberline 230kV Line

(Existing 6.67 miles of 1780 ACSR OH):

$$Z_{1_pu} = 0.000716 + j0.009271 \text{ pu} \quad \beta_{1_pu} = 0.020818 \text{ pu}$$

$$Z_{1_pu/mile} = \frac{Z_{1_pu}}{6.67} \rightarrow 0.000107 + j0.001390 \text{ pu/mile}$$

$$\beta_{1_pu/mile} = \frac{\beta_{1_pu}}{6.67} \rightarrow 0.003121 \text{ pu/mile}$$

Avery - Carey 230kV Line

(0.61 miles of OH):

$$Z_{2_pu} = Z_{1_pu/mile} * 0.61 \rightarrow 0.000157 + j0.002038 \text{ pu}$$

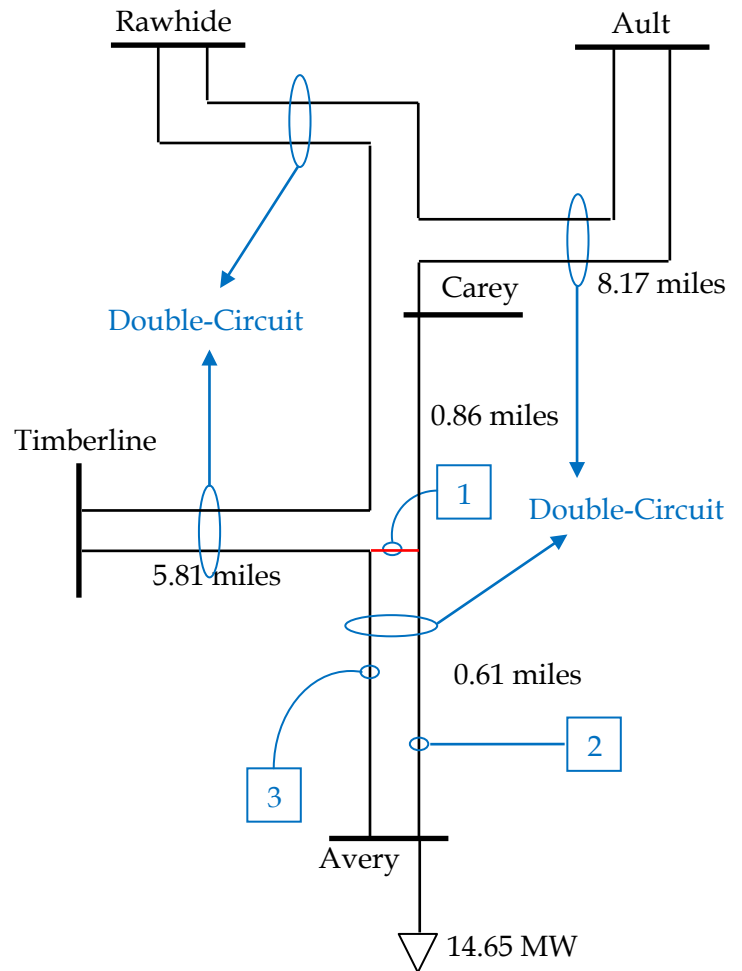
$$\beta_{2_pu} = \beta_{1_pu/mile} * 0.61 \rightarrow 0.004576 \text{ pu}$$

Avery - Timberline 230kV Line

(6.42 miles of OH):

$$Z_{3_pu} = Z_{1_pu/mile} * 6.42 \rightarrow 0.000689 + j0.008918 \text{ pu}$$

$$\beta_{3_pu} = \beta_{1_pu/mile} * 6.42 \rightarrow 0.020025 \text{ pu}$$



— 230kV Overhead (OH)



November 25, 2013
By: Jeremy Brownrigg

Calculations for Avery Project Scenario 2:

Carey - Timberline 230kV Line

(Existing 6.67 miles of 1780 ACSR OH):

$$Z_{1_pu} = 0.000716 + j0.009271 \text{ pu} \quad \beta_{1_pu} = 0.020818 \text{ pu}$$

$$Z_{1_pu/mile} = \frac{Z_{1_pu}}{6.67} \rightarrow 0.000107 + j0.001390 \text{ pu/mile}$$

$$\beta_{1_pu/mile} = \frac{\beta_{1_pu}}{6.67} \rightarrow 0.003121 \text{ pu/mile}$$

Avery - Carey 230kV Line

(2.78 miles of OH):

$$Z_{2_pu} = Z_{1_pu/mile} * 2.78 \rightarrow 0.000298 + j0.003864 \text{ pu}$$

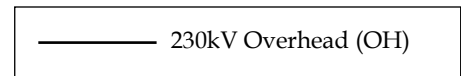
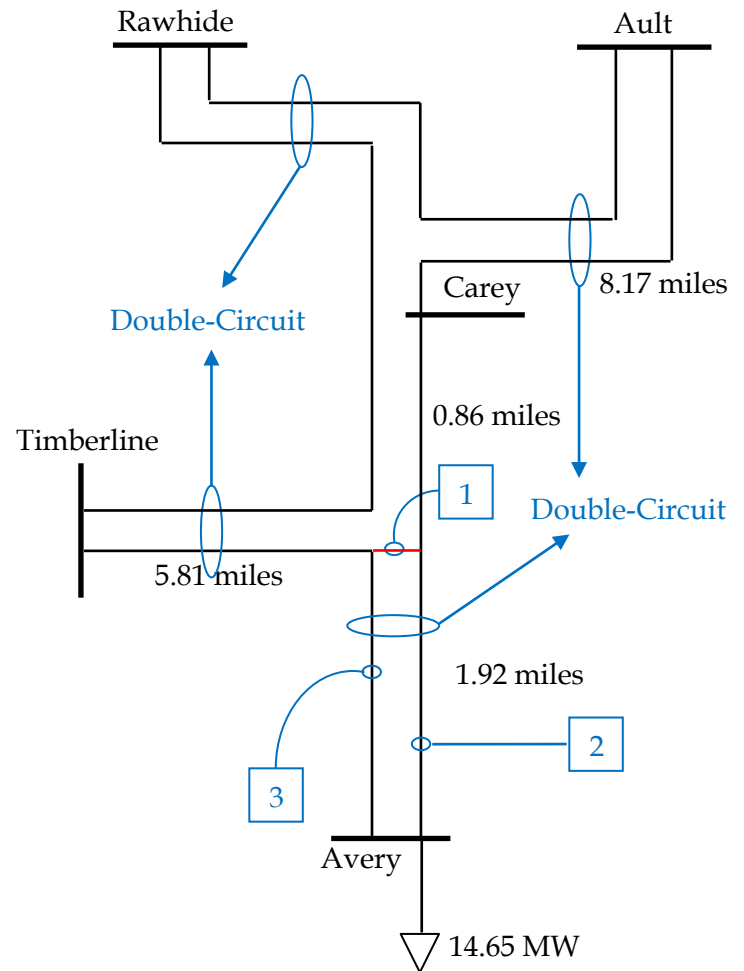
$$\beta_{2_pu} = \beta_{1_pu/mile} * 2.78 \rightarrow 0.008677 \text{ pu}$$

Avery - Timberline 230kV Line

(7.73 miles of OH):

$$Z_{3_pu} = Z_{1_pu/mile} * 7.73 \rightarrow 0.000830 + j0.010744 \text{ pu}$$

$$\beta_{3_pu} = \beta_{1_pu/mile} * 7.73 \rightarrow 0.024126 \text{ pu}$$





November 25, 2013
By: Jeremy Brownrigg

Calculations for Avery Project Scenario 3:

Ault - Carey 230kV Line
(Existing 8.17 miles of 1780 ACSR OH):

$$Z_{1_pu} = 0.000877 + j0.011356 \text{ pu} \quad \beta_{1_pu} = 0.025500 \text{ pu}$$

$$Z_{1_pu/mile} = \frac{Z_{1_pu}}{8.17} \rightarrow 0.000107 + j0.001390 \text{ pu/mile}$$

$$\beta_{1_pu/mile} = \frac{\beta_{1_pu}}{8.17} \rightarrow 0.003121 \text{ pu/mile}$$

Ault - Avery 230kV Line
(10.11 miles of OH):

$$Z_{2_pu} = Z_{1_pu/mile} * 10.11 \rightarrow 0.001085 + j0.014054 \text{ pu}$$

$$\beta_{2_pu} = \beta_{1_pu/mile} * 10.01 \rightarrow 0.031560 \text{ pu}$$

Avery - Carey 230kV Line
(3.94 miles of OH):

$$Z_{3_pu} = Z_{1_pu/mile} * 3.94 \rightarrow 0.000423 + j0.005478 \text{ pu}$$

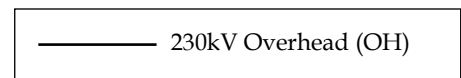
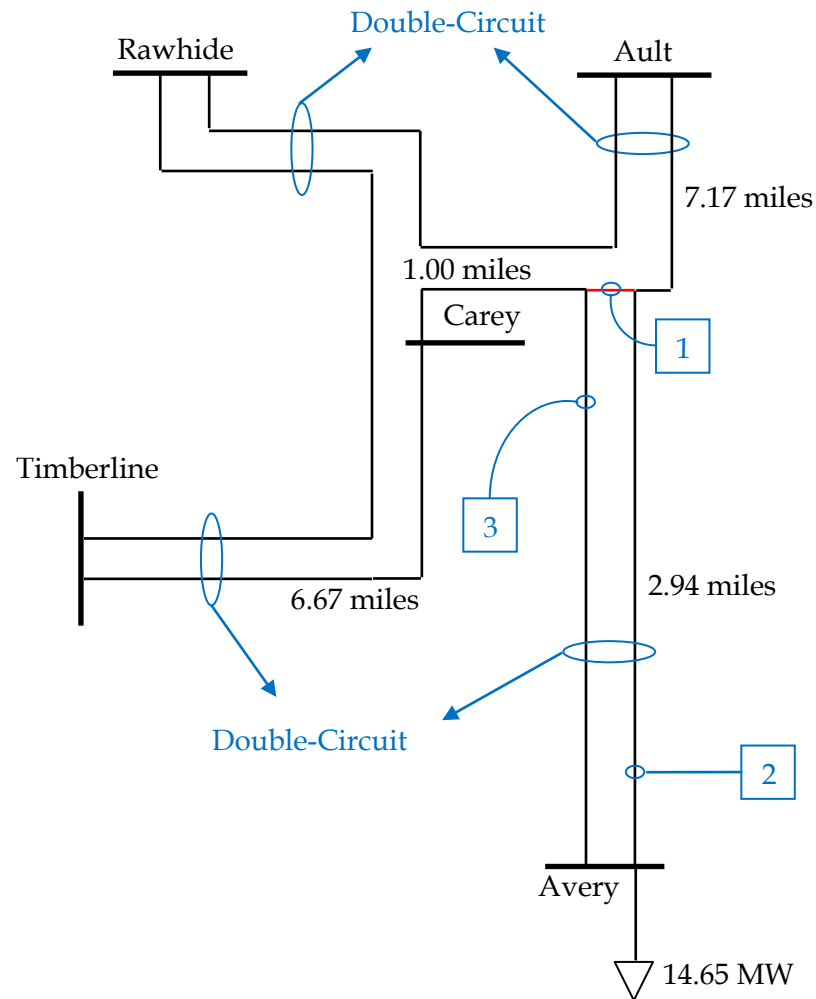
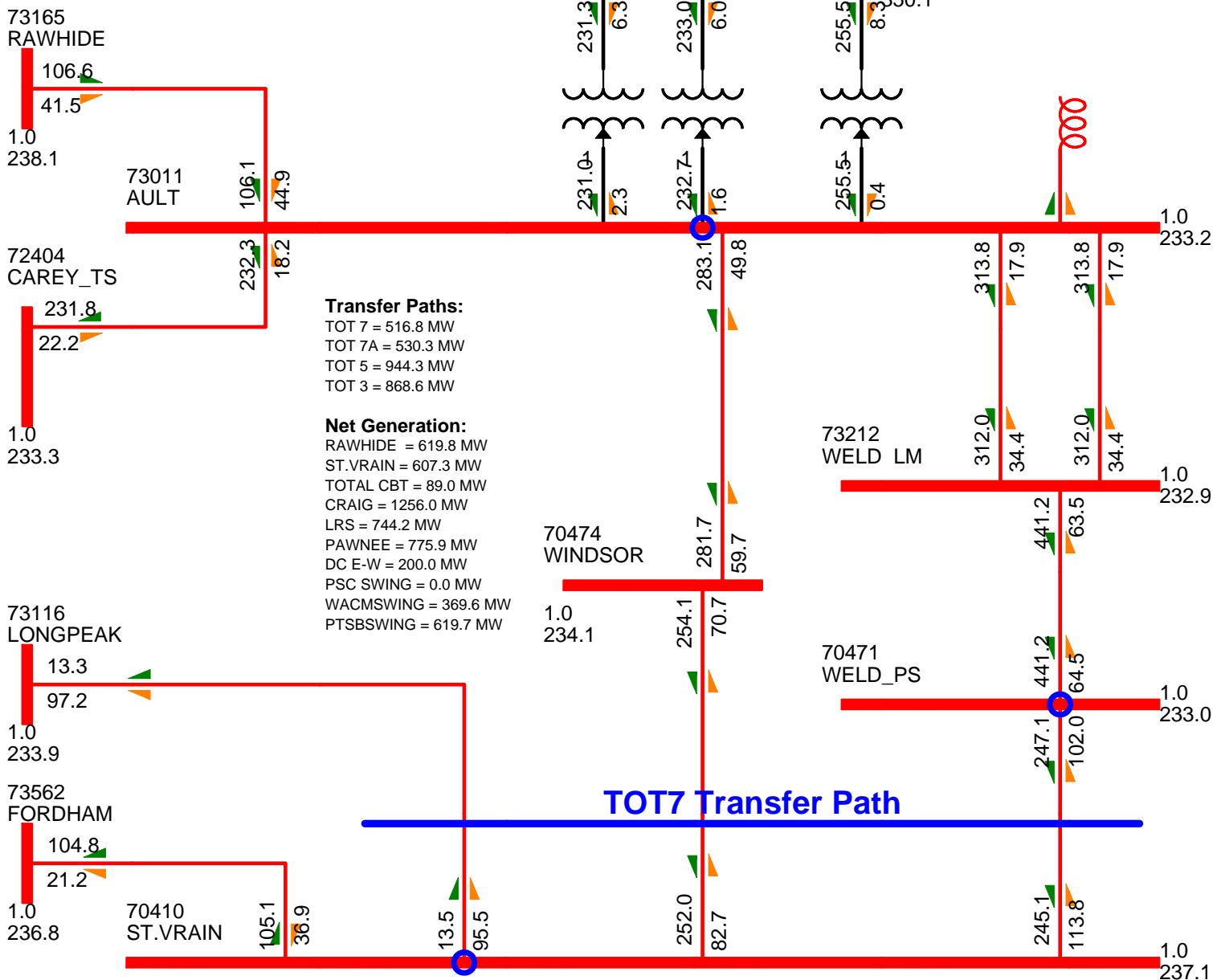
$$\beta_{3_pu} = \beta_{1_pu/mile} * 3.94 \rightarrow 0.012301 \text{ pu}$$


Exhibit 4

TOT7 Transfer Path 40:
Ault* - Windsor - FSV 230kV Line
Weld* - FSV 230kV Line
Longs Peak - FSV* 230kV Line
*** = Metered Terminal**
TOT 7 = 516.8 MW



TOT7.sld

T7_LIMIT_18HS_AVERY
 T7=516.8;T7A=530.3;T3=868.6;T5=944.3;RAWH=619.8;CBT=89.0;
 TUE, AUG 26 2014 13:26

Bus - Voltage (kV/pu)
 Branch - MW/Mvar
 Equipment - MW/Mvar
 100.0%Rate A
 1.045OV 0.950UV
 kV: <=115.000 <=230.000 <=345.000 >345.000

Exhibit 5

18HS_Avery.py

```
'''
THIS FILE: 18HS_Avery.py

VERSION of PSSE: 33.4.0

DATE: 11-25-2013

BY: jrb at PRPA

PURPOSE: 18HS Case Adjustments

APPLY THIS FILE ON starting case:  ccpg_2018HS_R2.sav (clean CCPG 18HS approved case)
'''

import os
import sys
import redirect
import psspy
import totCalc

def addAveryBusLd():
    ierr, Carey_buskV = psspy.busdat(72404,"PU")
    ierr, Carey_busAng = psspy.busdat(72404,"ANGLED")
    psspy.bus_data_3(70010,[1,73,754,65],[230.0,Carey_buskV,Carey_busAng],"AVERY")
    ierr, ld_CBLK = psspy.loaddt2(73600,'PS','MVA','ACT')
    ierr, ld_WIND = psspy.loaddt2(70474,'P1','MVA','ACT')
    ld_Avery_Xfer = 5+1.64j
    psspy.load_data_4(73600,'PS',[1],[ld_CBLK-ld_Avery_Xfer).real,(ld_CBLK-ld_Avery_Xfer).imag])
    psspy.load_data_4(70474,'P1',[1],[ld_WIND.real-ld_Avery_Xfer.real,ld_WIND.imag-ld_Avery_Xfer.imag])
    psspy.load_data_4(70010,'PS',[1,73,754,65],[14.65,6.24])

def slvNsav(case):
    ierr = psspy.fdns(solOpts) # Solve case
    totData,totKeys = totCalc.getTotList(rootDir+totFileName) # Get TOT calculations
    totStr = totCalc.getTotFlows(totData,totKeys) # Store TOT values in string
    ierr = psspy.case_title_data(case,totStr) # Change case title
    ierr = psspy.save(case) # Save case

def stressT7(caseT7):
    #Set case to stress TOT7 and balance system
    # Increased Gen +55 MW and noticed PTSB +40 MW to account for losses from stressing
    psspy.machine_data_2(73129, '1',[1],[605.0]) # --> LRS1 (+ 98)
    psspy.machine_data_2(73181, '1',[1],[200.0]) # --> SIDNEYDC (+ 4)
    psspy.machine_data_2(76351, '1',[1],[200.0]) # --> RCDC (+ 330)
    psspy.machine_data_2(70310,'C1',[1],[530.0]) # --> PAWNEE (+ 25)
    psspy.machine_data_2(70314,'G1',[1],[140.0]) # --> MANCHIEF1 (+ 10)
    psspy.machine_data_2(70315,'G2',[1],[140.0]) # --> MANCHIEF2 (+ 10)
    psspy.machine_data_2(70591,'G3',[1],[ 57.0]) # --> RMEC3 (- 90)
    psspy.machine_data_2(70589,'G2',[1],[ 57.0]) # --> RMEC2 (- 90)
    psspy.machine_data_2(70588,'G1',[1],[ 97.0]) # --> RMEC1 (- 195)
    psspy.machine_data_2(70593,'G1',[1],[ 25.0]) # --> SPIN1 (- 109)
    psspy.machine_data_2(70594,'G2',[1],[ 25.0]) # --> SPIN2 (- 109)
    psspy.machine_data_2(70448,'G6',[1],[ 23.0]) # --> VAL6 (+ 23)
    psspy.machine_data_2(70409,'G1',[1],[ 35.0]) # --> FSV (- 275)
    psspy.machine_data_2(70406,'G2',[1],[ 45.0]) # --> FSV2 (- 82)
    psspy.machine_data_2(70407,'G3',[1],[ 45.0]) # --> FSV3 (- 87)
    psspy.machine_data_2(70408,'G4',[1],[ 45.0]) # --> FSV4 (- 87)
    psspy.machine_data_2(70950,'G5',[1],[ 35.0]) # --> FSV5 (- 113)
    psspy.machine_data_2(70951,'G6',[1],[ 35.0]) # --> FSV6 (- 112)
    psspy.machine_data_2(70503,'W1',[1],[ 21.3]) # --> PONN (+ 15)
    psspy.machine_data_2(70721,'W1',[1],[ 42.6]) # --> SPRINGCAN (+ 30)
    psspy.machine_data_2(62047, '1',[1],[823.0]) # --> COLSTP4 (+ 18)
    psspy.machine_data_2(62048, '1',[1],[823.0]) # --> COLSTP3 (+ 35)
    psspy.machine_data_2(73226, '1',[1],[ 66.0]) # --> YELLOW1 (+ 9)
    psspy.machine_data_2(73226, '2',[1],[ 66.0]) # --> YELLOW2 (+ 9)
    psspy.machine_data_2(73227, '3',[1],[ 66.0]) # --> YELLOW3 (+ 9)
    psspy.machine_data_2(73227, '4',[1],[ 66.0]) # --> YELLOW4 (+ 9)
    psspy.machine_data_2(65778, '1',[1],[129.0]) # --> HINSHAW (+ 80)
    psspy.machine_data_2(69032, '1',[1],[ 99.0]) # --> DNLP1 (+ 60)
    psspy.machine_data_2(69519, '1',[1],[127.0]) # --> CEDRC (+ 80)
    psspy.machine_data_2(69092, '1',[1],[ 90.0]) # --> THREE (+ 55)
    psspy.machine_data_2(69003, '1',[1],[111.5]) # --> GLENRK1 (+ 70)
    psspy.machine_data_2(69004, '1',[1],[111.5]) # --> GLENRK2 (+ 70)
    psspy.machine_data_2(65584, '1',[1],[ 50.0]) # --> FT CRK1 (+ 32)
    psspy.machine_data_2(65585, '1',[1],[ 85.0]) # --> FT CRK1 (+ 55)
    psspy.machine_data_2(69073, '1',[1],[ 94.6]) # --> HIPLN (+ 50)
    psspy.machine_data_2(69027, '1',[1],[ 81.5]) # --> 7MIHL (+ 40)
    psspy.machine_data_2(69020, '1',[1],[ 59.3]) # --> MTNWD1 (+ 38)
    psspy.machine_data_2(69022, '1',[1],[ 72.9]) # --> MTNWD4 (+ 45)
    psspy.machine_data_2(66055, '1',[1],[166.0]) # --> NAUGH1 (+ 40)
    psspy.machine_data_2(69511, '1',[1],[160.0]) # --> TOPW_G (+ 90)
    psspy.machine_data_2(69523, '1',[1],[ 40.1]) # --> SUNBEAM (+ 25)
    slvNsav(caseT7)

def stressT72L(caseT7L):
    #Set case to TOT7 Limit
    psspy.machine_data_2(73129, '1',[1],[405.0]) # --> LRS1 (- 200)
    psspy.machine_data_2(73130, '1',[1],[410.0]) # --> LRS2 (- 195)
    psspy.machine_data_2(70409,'G1',[1],[335.0]) # --> FSV (+ 300)
    psspy.machine_data_2(70408,'G4',[1],[ 90.0]) # --> FSV4 (+ 45)
    psspy.machine_data_2(70407,'G3',[1],[ 95.0]) # --> FSV3 (+ 50)
    slvNsav(caseT7L)
```

18HS_Avery.py

```
if __name__ == '__main__':

    solOpts = [0,0,0,1,1]
    caseName = r""18HS_Avery""
    caseNameT7 = r""T7_"" + caseName
    caseNameT7L = r""T7_Limit_"" + caseName
    caseNameSc1 = caseName + r""_Scenario1.sav""
    caseNameSc2 = caseName + r""_Scenario2.sav""
    caseNameSc3 = caseName + r""_Scenario3.sav""
    caseNameSc1T7 = r""T7_"" + caseNameSc1
    caseNameSc2T7 = r""T7_"" + caseNameSc2
    caseNameSc3T7 = r""T7_"" + caseNameSc3
    rootDir = os.getcwd()+"\\
    logFile = file(rootDir+caseName+"_Log.txt", "w")
    sys.stdout = logFile
    sys.stderr = logFile
    totFileName = "mattot.txt"

    # Init PSSE
    ierr = redirect.psse2py()
    ierr = psspy.psseinit(150000)

    psspy.case(r""ccpg_2018HS_R2.sav""")

    # Set Rawhide to MAX at 645 (+ 70) Gross
    psspy.machine_data_2(70350, 'C1', [1], [300.0]) # --> RH1
    psspy.machine_data_2(70351, 'GA', [1], [ 55.0]) # --> RHA
    psspy.machine_data_2(70568, 'GB', [1], [ 55.0]) # --> RHB
    psspy.machine_data_2(70569, 'GC', [1], [ 55.0]) # --> RHC
    psspy.machine_data_2(70567, 'GD', [1], [ 55.0]) # --> RHD
    psspy.machine_data_2(70561, 'GF', [1], [125.0]) # --> RHF

    # Set CBT to 90 (- 70)
    psspy.machine_data_2(73299, '1', [0], [ 4.0]) # --> BIGHTHOMP
    psspy.machine_data_2(73306, '1', [1], [15.0]) # --> ESTES1
    psspy.machine_data_2(73307, '1', [1], [15.0]) # --> ESTES2
    psspy.machine_data_2(73308, '1', [1], [15.0]) # --> ESTES3
    psspy.machine_data_2(73319, '1', [1], [ 5.0]) # --> MARYLKPP
    psspy.machine_data_2(73324, '1', [1], [15.0]) # --> POLEHILL
    psspy.machine_data_2(73448, '2', [1], [25.0]) # --> FLATIRN1
    psspy.machine_data_2(73449, '1', [0], [43.0]) # --> FLATIRN2
    psspy.machine_data_2(73449, '3', [0], [ 8.0]) # --> FLATIRN2

    # Change Ratings
    psspy.branch_data(72404, 73011, '1', realar4=634, realar5=634, realar6=634) # CRY-AU 230
    psspy.branch_data(72404, 73199, '1', realar4=634, realar5=634, realar6=634) # CRY-TP 230

    # Change PSCo's Weld TFMR to be in-service 2014
    psspy.two_winding_data_3(70470, 70471, 'T2', realari1=0.00085, realari2=0.03619, realari16=0.00062, realari17=-0.00069)
    psspy.two_winding_data_3(70470, 70471, 'T2', realari9=280.0, realari10=322.0, realari11=280.0)

    slvNsav(caseName)
    stressT7(caseNameT7)
    stressT72L(caseNameT7L)

    # Load original case
    psspy.case(caseName)

    # Add Avery Substation Scenario 1
    addAveryBusLd()
    psspy.purgbrn(72404, 73199, '1') # Delete CRY-TP 230
    psspy.branch_data(72404, 70010, '1', [1, 70010, 93], [0.000157, 0.002038, 0.004576, 634, 634, 634], realar11=0.61) # Add CRY-AVRY 230
    psspy.branch_data(73199, 70010, '1', [1, 70010, 93], [0.000689, 0.008918, 0.020025, 634, 634, 634], realar11=6.42) # Add TP-AVRY 230
    slvNsav(caseNameSc1)
    stressT7(caseNameSc1T7)

    # Load original case
    psspy.case(caseName)

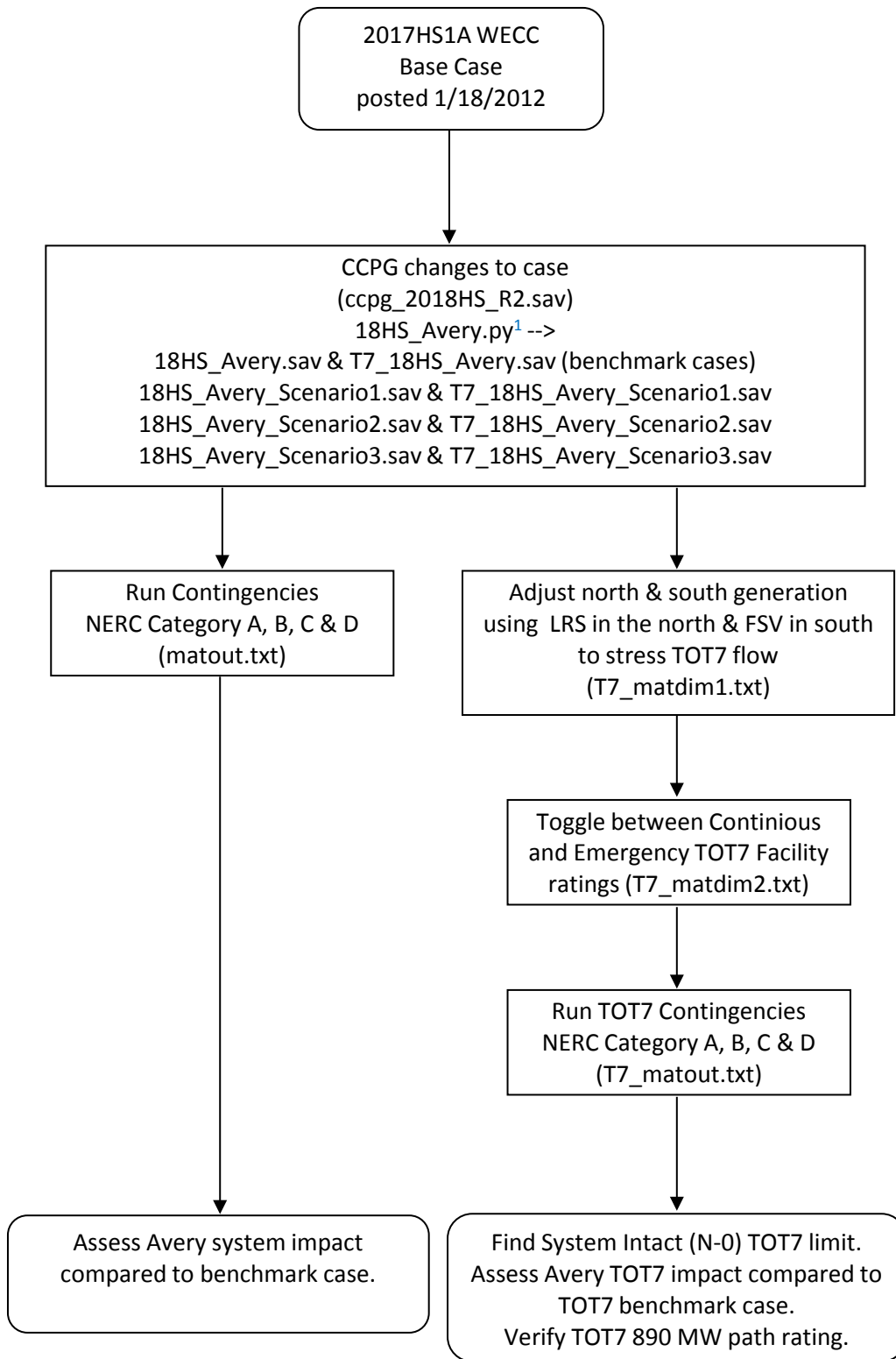
    # Add Avery Substation Scenario 2
    addAveryBusLd()
    psspy.purgbrn(72404, 73199, '1') # Delete CRY-TP 230
    psspy.branch_data(72404, 70010, '1', [1, 70010, 93], [0.000298, 0.003864, 0.008677, 634, 634, 634], realar11=2.78) # Add CRY-AVRY 230
    psspy.branch_data(73199, 70010, '1', [1, 70010, 93], [0.000830, 0.010744, 0.024126, 634, 634, 634], realar11=7.73) # Add TP-AVRY 230
    slvNsav(caseNameSc2)
    stressT7(caseNameSc2T7)

    # Load original case
    psspy.case(caseName)

    # Add Avery Substation Scenario 3
    addAveryBusLd()
    psspy.purgbrn(72404, 73011, '1') # Delete CRY-AU 230
    psspy.branch_data(73011, 70010, '1', [1, 70010, 93], [0.001085, 0.014054, 0.031560, 634, 634, 634], realar11=10.11) # Add AU-AVRY 230
    psspy.branch_data(72404, 70010, '1', [1, 70010, 93], [0.000423, 0.005478, 0.012301, 634, 634, 634], realar11=3.94) # Add CRY-AVRY 230
    slvNsav(caseNameSc3)
    stressT7(caseNameSc3T7)

    logFile.close()
```

Exhibit 6



¹ 18HS_Avery.py is a python change file for creating several cases to be used for changing system topology to accommodate the various Avery Substation Interconnection Scenarios and stress the TOT7 transfer path and is provided in the previous pages of this report.

Exhibit 7

BusID	BusName	BusKV	BusID	BusName	BusKV	BusID	BusName	BusKV	BusID	BusName	BusKV
70005	BRUSH_SS	115	70008	KELIM	115	70190	DAVIS	115	70191	FTLUPTON	115
70192	FTLUPTON	230	70198	GILCREST	115	70202	GODFRETP	115	70209	GREELEY	115
70240	JOHNSTN	115	70246	JOHNSTN2	115	70290	MONFORT	115	70311	PAWNEE	230
70368	ROSEDALE	115	70397	B.CRK_PS	115	70399	B.CRK_PS	230	70410	ST.VRAIN	230
70439	UNC	115	70470	WELD_PS	115	70471	WELD_PS	230	70474	WINDSOR	230
70475	ARROWHLK	115	70529	JLGREEN	230	70534	BERTHOUD	115	70598	PAWNEE	345
70599	SMOKYHIL	345	70605	HENRYLAK	230	70606	HENRYLAK	115	70607	BROMLEY	115
70711	PTZLOGN	230	70820	KEENSBG	230	70821	CEDARCRK	230	72107	SLATER_TS	115
72200	ERIE	230	72201	SIPRES	230	72404	CAREY_TS	230	72407	DOWE FLATS	115
73002	AIRPORT	115	73011	AULT	230	73012	AULT	345	73024	BLKHLWTP	115
73026	BOYD	115	73027	BOYD	230	73030	BRIGHTNW	115	73033	LAPORTAP	230
73039	CARTERLK	115	73044	COBBLKTP	115	73048	DEL CTAP	115	73049	DELCAMIN	115
73050	DERBYHIL	115	73051	DIXON CK	115	73052	DRAKE RD	115	73056	ESTES	115
73058	FLATIRON	115	73060	FORDHAM	115	73078	HARMONY	230	73079	HARVARD	115
73086	HORSESHO	115	73089	HRSTHTAP	115	73090	HYGIENE	115	73098	KODAK	115
73105	LAPORTE	115	73106	LAPORTE	230	73111	LINDEN	115	73113	LNGMNTNW	115
73114	LONETREE	115	73115	LONGPEAK	115	73116	LONGPEAK	230	73118	LOVE E	115
73120	LOVE W	115	73124	LOVEWTAP	115	73127	LYONS	115	73133	MEADOW	115
73145	NUNN	115	73155	POLEHILL	115	73156	POUDRE	115	73165	RAWHIDE	230
73169	RICHARDS	115	73171	ROCKMTCM	115	73172	ROCKPRTP	115	73196	TERRY	115
73198	TIMBERLN	115	73199	TIMBERLN	230	73200	TIMNATH	115	73203	TRILBY	115
73211	WELD LM	115	73212	WELD LM	230	73218	WINDSOR	115	73231	MARYLKPP	115
73232	MARYLKS	115	73233	MARYLKTP	115	73235	MASONVIL	115	73297	BELLEVUE	115
73298	BELLVUTP	115	73325	RIPPLE	115	73373	VALLEYLM	115	73433	WINDSORT	115
73437	ROGERSRD	115	73465	CNTYLINE	115	73466	RICHRDTP	115	73467	DIXON CK	230
73470	COLLEGLK	230	73499	CROSSRDS	115	73501	RINNVALL	115	73502	DACONO	115
73503	ERIE SW	115	73504	PONNEQUI	115	73506	LAPORTAP	115	73535	HORSESHO	230
73552	AULT	115	73553	BOXELDER	115	73554	BOOMERNG	115	73555	BRACEWLL	115
73556	WAGONWHL	115	73557	FORTNE	115	73558	WHITNEY	115	73561	LONTRETP	115
73562	FORDHAM	230	73578	GLDNPND	115	73595	DERBHILT	115	73597	OWL_CRK	115
73600	COBBLAKE	115	73604	PORTNER	230						

FromBusID	ToBusID	Ckt	FromBusName	BusKV	ToBusName	BusKV
70191	70192	T1	FTLUPTON	115	FTLUPTON	230
70209	70210	T2	GREELEY	115	GREELEY1	46
70396	70599	T5	SMOKYHIL	230	SMOKYHIL	345
70469	70470	T1	WELD	46	WELD_PS	115
70605	70606	T1	HENRYLAK	230	HENRYLAK	115
73011	73012	1	AULT	230	AULT	345
73011	73012	3	AULT	230	AULT	345
73026	73027	1	BOYD	115	BOYD	230
73051	73467	1	DIXON CK	115	DIXON CK	230
73060	73562	1	FORDHAM	115	FORDHAM	230
73086	73535	1	HORSESHO	115	HORSESHO	230
73105	73106	1	LAPORTE	115	LAPORTE	230
73115	73116	2	LONGPEAK	115	LONGPEAK	230
73198	73199	2	TIMBERLN	115	TIMBERLN	230
73211	73212	3	WELD LM	115	WELD LM	230
70598	70311	T2	PAWNEE	345	PAWNEE	230
70624	70623	T1	MIS_SITE	345	MIS_SITE	230
70005	70397	2	BRUSH_SS	115	B.CRK_PS	115
70048	70192	1	GREENVAL	230	FTLUPTON	230
70048	70820	2	GREENVAL	230	KEENSBG	230
70190	70191	1	DAVIS	115	FTLUPTON	115
70191	70307	1	FTLUPTON	115	P.VALLEY	115
70192	70311	1	FTLUPTON	230	PAWNEE	230
70192	70410	2	FTLUPTON	230	ST.VRAIN	230
70192	70605	1	FTLUPTON	230	HENRYLAK	230
70198	70450	1	GILCREST	115	VASQUEZ	115
70202	70240	1	GODFRETP	115	JOHNSTN	115
70209	70470	1	GREELEY	115	WELD_PS	115
70246	70470	1	JOHNSTN2	115	WELD_PS	115
70311	70545	1	PAWNEE	230	BRICKCTR	230
70311	70711	1	PAWNEE	230	PTZLOGN	230
70362	70605	1	RIVERDAL	230	HENRYLAK	230
70368	70475	1	ROSEDALE	115	ARROWHLK	115
70399	73192	1	B.CRK_PS	230	STORY	230
70410	70474	1	ST.VRAIN	230	WINDSOR	230
70410	70592	1	ST.VRAIN	230	SPNDLE	230
70410	73116	1	ST.VRAIN	230	LONGPEAK	230
70461	70529	1	WASHINGT	230	JLGREEN	230
70470	73211	1	WELD_PS	115	WELD LM	115
70474	73011	1	WINDSOR	230	AULT	230
70534	73561	1	BERTHOUD	115	LONTRETP	115
70598	70624	1	PAWNEE	345	MIS_SITE	345
70605	72201	1	HENRYLAK	230	SIPRES	230
70605	73539	1	HENRYLAK	230	HOYT	230
70607	70612	1	BROMLEY	115	PRARI_TS	115
72107	73048	1	SLATER_TS	115	DEL CTAP	115
72200	72201	1	ERIE	230	SIPRES	230
72404	73199	1	CAREY_TS	230	TIMBERLN	230
72407	73171	1	DOWE FLATS	115	ROCKMTCM	115
73002	73433	1	AIRPORT	115	WINDSORT	115
73011	73165	1	AULT	230	RAWHIDE	230
73011	73212	2	AULT	230	WELD LM	230
73012	73108	1	AULT	345	LAR.RIVR	345
73024	73044	1	BLKHLWTP	115	COBBLKTP	115
73026	73118	1	BOYD	115	LOVE E	115
73026	73561	1	BOYD	115	LONTRETP	115
73027	73116	1	BOYD	230	LONGPEAK	230
73030	73493	1	BRIGHTNW	115	SANDCRK	115
73033	73165	1	LAPORTAP	230	RAWHIDE	230
73033	73470	1	LAPORTAP	230	COLLEGLK	230
73039	73124	1	CARTERLK	115	LOVEWTAP	115
73044	73200	1	COBBLKTP	115	TIMNATH	115
73044	73600	1	COBBLKTP	115	COBBLAKE	115
73048	73133	1	DEL CTAP	115	MEADOW	115
73050	73595	1	DERBYHIL	115	DERBHILT	115
73051	73089	1	DIXON CK	115	HRSTHTAP	115
73052	73198	1	DRAKE RD	115	TIMBERLN	115
73056	73155	1	ESTES	115	POLEHILL	115
73056	73233	1	ESTES	115	MARYLKTP	115
73058	73089	1	FLATIRON	115	HRSTHTAP	115

FromBusID	ToBusID	Ckt	FromBusName	BusKV	ToBusName	BusKV
70209	70210	T1	GREELEY	115	GREELEY1	46
70396	70599	T4	SMOKYHIL	230	SMOKYHIL	345
70397	70399	T1	B.CRK_PS	115	B.CRK_PS	230
70470	70471	T2	WELD_PS	115	WELD_PS	230
72200	73503	T1	ERIE	230	ERIE SW	115
73011	73012	2	AULT	230	AULT	345
73011	73552	1	AULT	230	AULT	115
73026	73027	2	BOYD	115	BOYD	230
73051	73467	2	DIXON CK	115	DIXON CK	230
73060	73562	2	FORDHAM	115	FORDHAM	230
73086	73535	2	HORSESHO	115	HORSESHO	230
73115	73116	1	LONGPEAK	115	LONGPEAK	230
73198	73199	1	TIMBERLN	115	TIMBERLN	230
73211	73212	1	WELD LM	115	WELD LM	230
73232	73436	1	MARYLKSB	115	MARYLKSB	69
70598	70311	T1	PAWNEE	345	PAWNEE	230
70005	70397	1	BRUSH_SS	115	B.CRK_PS	115
70008	73002	1	KELIM	115	AIRPORT	115
70048	70820	1	GREENVAL	230	KEENSBG	230
70127	70191	1	COORSREC	115	FTLUPTON	115
70190	70234	1	DAVIS	115	HUDSON	115
70191	70450	1	FTLUPTON	115	VASQUEZ	115
70192	70410	1	FTLUPTON	230	ST.VRAIN	230
70192	70529	1	FTLUPTON	230	JLGREEN	230
70198	70202	1	GILCREST	115	GODFRETP	115
70202	70209	1	GODFRETP	115	GREELEY	115
70209	70290	1	GREELEY	115	MONFORT	115
70240	70246	1	JOHNSTN	115	JOHNSTN2	115
70290	70439	1	MONFORT	115	UNC	115
70311	70623	1	PAWNEE	230	MIS_SITE	230
70311	73192	1	PAWNEE	230	STORY	230
70368	70439	1	ROSEDALE	115	UNC	115
70397	73020	1	B.CRK_PS	115	BEAVERCK	115
70410	70471	1	ST.VRAIN	230	WELD_PS	230
70410	70544	1	ST.VRAIN	230	ISABELLE	230
70410	70820	1	ST.VRAIN	230	KEENSBG	230
70410	73562	1	ST.VRAIN	230	FORDHAM	230
70470	70475	1	WELD_PS	115	ARROWHLK	115
70471	73212	1	WELD_PS	230	WELD LM	230
70534	73114	1	BERTHOUD	115	LONETREE	115
70590	70820	1	RMEC	230	KEENSBG	230
70599	70624	1	SMOKYHIL	345	MIS_SITE	345
70605	73192	1	HENRYLAK	230	STORY	230
70606	70607	1	HENRYLAK	115	BROMLEY	115
70820	70821	1	KEENSBG	230	CEDARCRK	230
72107	73049	1	SLATER_TS	115	DELCAMIN	115
72404	73011	1	CAREY_TS	230	AULT	230
72407	73127	1	DOWE FLATS	115	LYONS	115
73002	73026	1	AIRPORT	115	BOYD	115
73009	73011	1	ARCHER	230	AULT	230
73011	73212	1	AULT	230	WELD LM	230
73011	73488	1	AULT	230	TERRY_RANCH	230
73012	79014	1	AULT	345	CRAIG	345
73024	73552	1	BLKHLWTP	115	AULT	115
73026	73373	1	BOYD	115	VALLEYLM	115
73026	73595	1	BOYD	115	DERBHILT	115
73027	73604	1	BOYD	230	PORTNER	230
73030	73503	1	BRIGHTNW	115	ERIE SW	115
73033	73199	1	LAPORTAP	230	TIMBERLN	230
73039	73058	1	CARTERLK	115	FLATIRON	115
73043	73504	1	CHEYENNE	115	PONNEQUI	115
73044	73557	1	COBBLKTP	115	FORTNE	115
73048	73115	1	DEL CTAP	115	LONGPEAK	115
73049	73501	1	DELCAMIN	115	RINNVALL	115
73051	73052	1	DIXON CK	115	DRAKE RD	115
73051	73506	1	DIXON CK	115	LAPORTAP	115
73055	73554	1	KERSEY_W	115	BOOMERNG	115
73056	73232	1	ESTES	115	MARYLKSB	115
73056	73556	1	ESTES	115	WAGONWHL	115
73058	73155	1	FLATIRON	115	POLEHILL	115

FromBusID	ToBusID	Ckt	FromBusName	BusKV	ToBusName	BusKV
73060	73196	1	FORDHAM	115	TERRY	115
73078	73199	1	HARMONY	230	TIMBERLN	230
73079	73113	1	HARVARD	115	LNGMNTNW	115
73086	73499	1	HORSESHO	115	CROSSRDS	115
73089	73235	1	HRSTHTAP	115	MASONVIL	115
73090	73127	1	HYGIENE	115	LYONS	115
73098	73558	2	KODAK	115	WHITNEY	115
73105	73506	1	LAPORTE	115	LAPORTAP	115
73111	73169	1	LINDEN	115	RICHARDS	115
73113	73133	1	LNGMNTNW	115	MEADOW	115
73115	73465	1	LONGPEAK	115	CNTYLINE	115
73120	73124	1	LOVE W	115	LOVEWTAP	115
73127	73556	1	LYONS	115	WAGONWHL	115
73145	73552	1	NUNN	115	AULT	115
73156	73506	1	POUDRE	115	LAPORTAP	115
73169	73469	1	RICHARDS	115	WAVR PV	115
73172	73597	1	ROCKPRTP	115	OWL_CRK	115
73196	73503	1	TERRY	115	ERIE SW	115
73200	73466	1	TIMNATH	115	RICHRDTP	115
73211	73554	1	WELD LM	115	BOOMERNG	115
73218	73433	1	WINDSOR	115	WINDSORT	115
73232	73233	1	MARYLKS	115	MARYLKTP	115
73298	73325	1	BELLVUTP	115	RIPPLE	115
73373	73595	1	VALLEYLM	115	DERBHILT	115
73437	73578	1	ROGERSRD	115	GLDNPND	115
73467	73535	1	DIXON CK	230	HORSESHO	230
73502	73503	1	DACONO	115	ERIE SW	115
73555	73558	1	BRACEWLL	115	WHITNEY	115

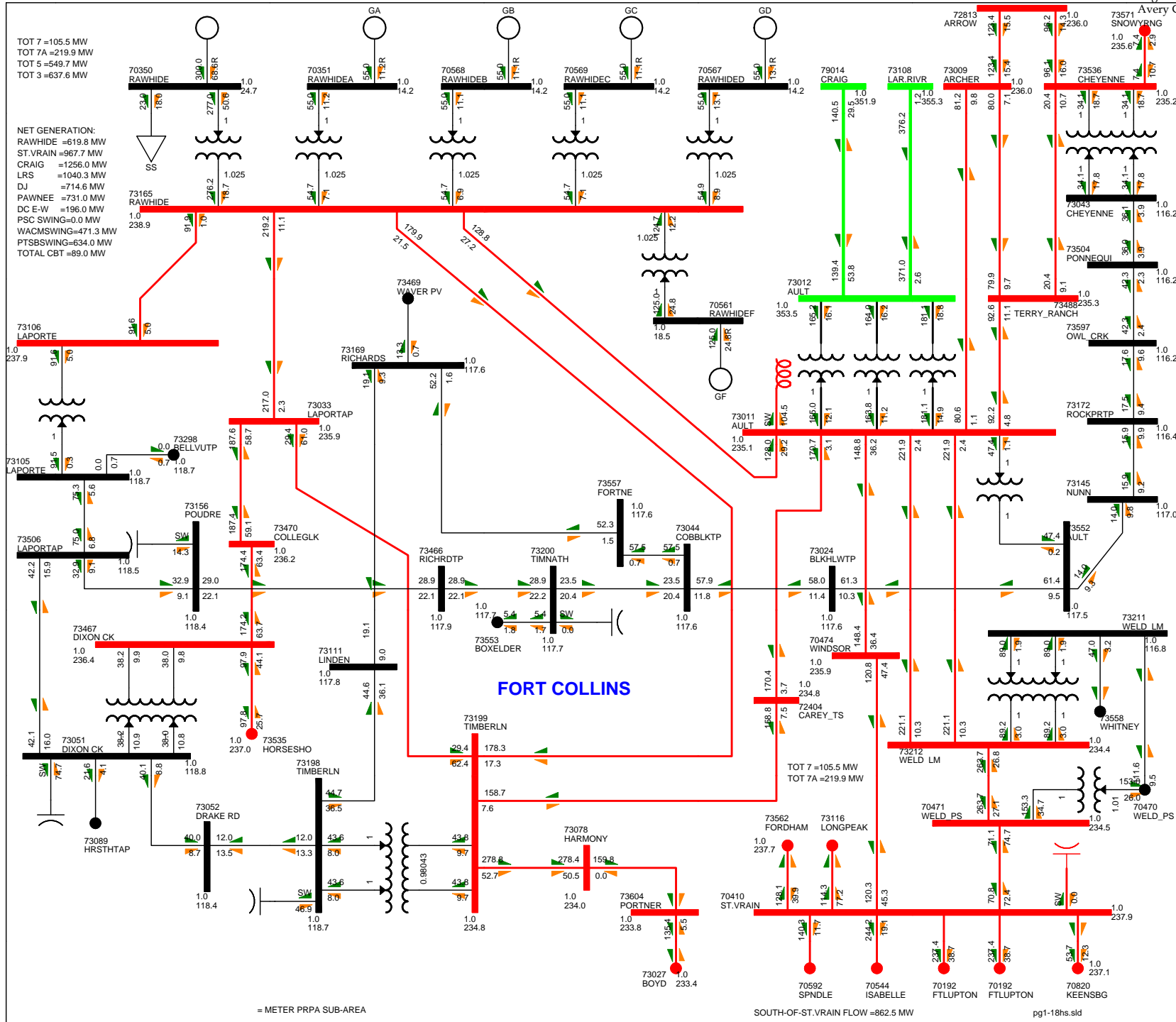
FromBusID	ToBusID	Ckt	FromBusName	BusKV	ToBusName	BusKV
73060	73437	1	FORDHAM	115	ROGERSRD	115
73078	73604	1	HARMONY	230	PORTNER	230
73086	73120	1	HORSESHO	115	LOVE W	115
73089	73203	1	HRSTHTAP	115	TRILBY	115
73090	73113	1	HYGIENE	115	LNGMNTNW	115
73098	73558	1	KODAK	115	WHITNEY	115
73105	73298	1	LAPORTE	115	BELLVUTP	115
73106	73165	1	LAPORTE	230	RAWHIDE	230
73111	73198	1	LINDEN	115	TIMBERLN	115
73113	73578	1	LNGMNTNW	115	GLDNPND	115
73118	73499	1	LOVE E	115	CROSSRDS	115
73124	73373	1	LOVEWTAP	115	VALLEYLM	115
73145	73172	1	NUNN	115	ROCKPRTP	115
73156	73466	1	POUDRE	115	RICHRDTP	115
73165	73199	1	RAWHIDE	230	TIMBERLN	230
73169	73557	1	RICHARDS	115	FORTNE	115
73196	73465	1	TERRY	115	CNTYLINE	115
73196	73578	1	TERRY	115	GLDNPND	115
73200	73553	1	TIMNATH	115	BOXELDER	115
73211	73558	1	WELD LM	115	WHITNEY	115
73231	73233	1	MARYLKPP	115	MARYLKTP	115
73297	73298	1	BELLEVUE	115	BELLVUTP	115
73325	73468	1	RIPPLE	115	WELL TP	115
73433	73558	1	WINDSORT	115	WHITNEY	115
73467	73470	1	DIXON CK	230	COLLEGLK	230
73501	73502	1	RINNVALL	115	DACONO	115
73504	73597	1	PONNEQUI	115	OWL_CRK	115
73555	73558	2	BRACEWLL	115	WHITNEY	115

Exhibit 8

BRUSH_SS_115-B.CRK_PS_115 GREENVAL_230-KEENSBG_230 DAVIS_115-HUDSON_115 FTLUPTON_230-ST.VRAIN_230 GILCREST_115-GODFRETP_115 GREELEY_115-MONFORT_115 MONFORT_115-UNC_115 PAWNEE_230-STORY_230 B.CRK_PS_115-BEAVRCK_115 ST.VRAIN_230-ISABELLE_230 ST.VRAIN_230-FORDHAM_230 BERTHOUD_115-LONETREE_115 SMOKYHIL_345-MIS_SITE_345 HENRYLAK_115-BROMLEY_115 SLATER_TS_115-DELCAMIN_115 DOWE FLATS_115-LYONS_115 ARCHER_230-AULT_230 AULT_230-TERRY_RANCH_230 BLKHLWTP_115-AULT_115 BOYD_115-DERBHILT_115 BRIGHTNW_115-ERIE SW_115 CARTERLK_115-FLATIRON_115 COBBLKTP_115-FORTNE_115 DELCAMIN_115-RINNVALL_115 DIXON CK_115-LAPORTAP_115 ESTES_115-MARYLSB_115 FLATIRON_115-POLEHILL_115 HARMONY_230-PORTNER_230 HRSTHTAP_115-TRILBY_115 KODAK_115-WHITNEY_115 LAPORTE_230-RAWHIDE_230 LNGMNTNW_115-GLDNPND5_115 LOVEWTAP_115-VALLEYLM_115 NUNN_115-AULT_115 RICHARDS_115-WAVER PV_115 TERRY_115-ERIE SW_115 WELD LM_115-BOOMERNG_115 MARYLSB_115-MARYLKTP_115 RIPPLE_115-WELL TP_115 DIXON CK_230-COLLEGLK_230 PONNEQUI_115-OWL_CK_115 BRUSH_SS_115-QF_B4-4T_13.8 #U4 FTLUP1-2_13.8-FTLUPTON_115 #U1 FTLUPTON_230-QF_T1-T2_13.8 #U2 PAWNEE_22.0-PAWNEE_230 #U1 RAWHIDE_24.0-RAWHIDE_230 #U1 B.CRK_PS_115-B.CRK_PS_230 #T1 ST.VRAIN_22.0-ST.VRAIN_230 #U1 WELD_46.0-WELD_PS_115 #T1 RAWHIDED_13.8-RAWHIDE_230 #UD PTZLOGN1_34.5-PTZLOGN_230 #U1 SPRNGCAN_34.5-SPRNGCAN_230 ERIE_230-ERIE SW_115 #T1 AULT_230-AULT_115 DIXON CK_115-DIXON CK_230 #2 FLATIRON_115-FLATIRN1_13.8 HORSESHO_115-HORSESHO_230 LONGPEAK_115-LONGPEAK_230 #2 WELD LM_115-WELD LM_230 BIGTHOMP_4.20-BIGTHOMP_13.8 ***RH-DX-TP 3-Terminal_230 ***LP-SL-MD 3-Terminal_115 ***WLD PS BKR 5221 WLD_115_AU_230 *** AVRY-CRY & AVRY-TP 2-CKT_230 ***RH-AU & CRY-AU 2-CKT_230 ***LATP-3-term & LI-TP 2-CKT_115_230 ***AU BKR 2186 TP & WI_230 ***TP BKR 2166 LN & DK_115 ***LP BKR 2186 T1 & FSV_230	BRUSH_SS_115-B.CRK_PS_115 #2 GREENVAL_230-KEENSBG_230 #2 FTLUPTON_115-P.VALLEY_115 FTLUPTON_230-ST.VRAIN_230 #2 GILCREST_115-VASQUEZ_115 GREELEY_115-WELD_PS_115 PAWNEE_230-BRICKCTR_230 RIVERDAL_230-HENRYLAK_230 B.CRK_PS_230-STORY_230 ST.VRAIN_230-SPNDLE_230 WASHINGT_230-JLGREEN_230 BERTHOUD_115-LONTRETP_115 HENRYLAK_230-SIPRES_230 BROMLEY_115-PRARI_TS_115 ERIE_230-SIPRES_230 DOWE FLATS_115-ROCKMTCM_115 AULT_230-RAWHIDE_230 AULT_345-LAR.RIVR_345 BOYD_115-LOVE E_115 BOYD_230-LONGPEAK_230 LAPORTAP_230-RAWHIDE_230 CARTERLK_115-LOVEWTAP_115 COBBLKTP_115-COBBLAKE_115 DERBYHIL_115-DERBHILT_115 DRAKE RD_115-TIMBERLN_115 ESTES_115-MARYLKTP_115 FORDHAM_115-TERRY_115 HARVARD_115-LNGMNTNW_115 HRSTHTAP_115-MASONVIL_115 KODAK_115-WHITNEY_115 #2 LINDEN_115-RICHARDS_115 LONGPEAK_115-CNTYLINE_115 LYONS_115-WAGONWHL_115 POUDRE_115-RICHRDTP_115 RICHARDS_115-FORTNE_115 TERRY_115-GLDNPND5_115 WELD LM_115-WHITNEY_115 BELLEVUE_115-BELLVUTP_115 VALLEYLM_115-DERBHILT_115 DIXON CK_230-HORSESHO_230 BRACEWILL_115-WHITNEY_115 BRUSH_SS_115-QF_CPP1T_13.8 #U1 FTLUPTON_115-FTLUPTON_230 #T1 FTLUPTON_230-QF_T1-T1_13.8 #U1 PAWNEE_22.0-PAWNEE_230 #U2 RAWHIDEA_13.8-RAWHIDE_230 #UA ST.VR_2_18.0-ST.VRAIN_230 #U2 ST.VRAIN_230-ST.VR_5_18.0 #U5 WELD_PS_115-WELD_PS_230 #T2 RAWHIDEB_13.8-RAWHIDE_230 #UB PTZLOGN_230-PTZLOGN2_34.5 #U2 CEDARCRK_230-CEDARCK1_34.5 #U1 AULT_230-AULT_345 BOYD_115-BOYD_230 ESTES_115-ESTES1_6.90 FLATIRON_115-FLATIRN2_13.8 HORSESHO_115-HORSESHO_230 #2 POLEHILL_115-POLEHILL_13.8 WELD LM_115-WELD LM_230 #3 PAWNEE_345-PAWNEE_230-PAWNEE_13.8 #T2 ***DX-LA-PD 3-Terminal_115 ***RH Unit_C1_24 ***WLD Bus Tie or BKRFAIL_115 ***RH E 2-CKT_230 ***RH W 2-CKT_230 ***HY-TP & DK-TP 2-CKT_115_230 ***TP BKR 1282 HY & LATP-3-term_230 ***DX BKR 482 T2 & LATP-3-term_230	KELIM_115-AIRPORT_115 COORSREC_115-FTLUPTON_115 FTLUPTON_115-VASQUEZ_115 FTLUPTON_230-JLGREEN_230 GODFRETP_115-GREELEY_115 JOHNSTN_115-JOHNSTN2_115 PAWNEE_230-MIS_SITE_230 ROSEDALE_115-UNC_115 ST.VRAIN_230-WELD_PS_230 ST.VRAIN_230-KEENSBG_230 WELD_PS_115-ARROWHLK_115 RMEC_230-KEENSBG_230 HENRYLAK_230-STORY_230 KEENSBG_230-CEDARCRK_230 CAREY_TS_230-AULT_230 AIRPORT_115-BOYD_115 AULT_230-WELD LM_230 AULT_345-CRAIG_345 BOYD_115-VALLEYLM_115 BOYD_230-PORTNER_230 LAPORTAP_230-TIMBERLN_230 CHEYENNE_115-PONNEQUI_115 DEL CTAP_115-LONGPEAK_115 DIXON CK_115-DRAKE RD_115 KERSEY_W_115-BOOMERNG_115 ESTES_115-WAGONWHL_115 FORDHAM_115-ROGERSRD_115 HORSESHO_115-LOVE W_115 HYGIENE_115-LNGMNTNW_115 LAPORTE_115-BELLVUTP_115 LINDEN_115-TIMBERLN_115 LOVE E_115-CROSSRDS_115 MCKENZIE_69.0-MARYLSB_69.0 POUDRE_115-LAPORTAP_115 ROCKPRTP_115-OWL_CK_115 TIMNATH_115-RICHRDTP_115 WINDSOR_115-WINDSORT_115 BELLVUTP_115-RIPPLE_115 WINDSORT_115-WHITNEY_115 RINNVALL_115-DACONO_115 BRACEWILL_115-WHITNEY_115 #2 BRUSH_SS_115-QF_CPP3T_13.8 #U3 FTLUPTON_230-JMSHAFR2_13.8 #U4 GREELEY_115-GREELEY1_46.0 #T1 PAWNEE_230-MANCHEF1_16.0 #U1 SMOKYHIL_230-SMOKYHIL_345 #T4 ST.VR_3_18.0-ST.VRAIN_230 #U3 ST.VRAIN_230-ST.VR_6_18.0 #U6 PONNEQUI_26.1-PONNEQUI_115 #U1 RAWHIDEC_13.8-RAWHIDE_230 #UC PTZLOGN_230-PTZLOGN3_34.5 #U3 CEDARCRK_230-CEDARCK2_34.5 #U2 AULT_230-AULT_345 #2 BOYD_115-BOYD_230 #2 ESTES_115-ESTES2_6.90 FORDHAM_115-FORDHAM_230 LAPORTE_115-LAPORTE_230 TIMBERLN_115-TIMBERLN_230 MARYLKPP_115-MARYLKPP_6.90 PAWNEE_345-PAWNEE_230-PAWNEE_13.8 #T1 ***PD-RL-TI 3-Terminal_115 ***Pawnee Unit_C1_22 ***DX-HS & DX-FI 2-CKT_115_230 ***RH-AU-CRY 3-CKT_230 ***LATP-3-terms 2-CKT_115_230 ***LP-CL & DC-3-term 2-CKT_115 ***TP BKR 1186 LATP-3-term & RH_230 ***BYD BKR 1186 T1 & LP_230	GREENVAL_230-FTLUPTON_230 DAVIS_115-FTLUPTON_115 FTLUPTON_230-PAWNEE_230 FTLUPTON_230-HENRYLAK_230 GODFRETP_115-JOHNSTN_115 JOHNSTN2_115-WELD_PS_115 PAWNEE_230-PTZLOGN_230 ROSEDALE_115-ARROWHLK_115 ST.VRAIN_230-WINDSOR_230 ST.VRAIN_230-LONGPEAK_230 WINDSOR_230-AULT_230 PAWNEE_345-MIS_SITE_345 HENRYLAK_230-HOYT_230 SLATER_TS_115-DEL CTAP_115 CAREY_TS_230-TIMBERLN_230 AIRPORT_115-WINDSORT_115 AULT_230-WELD LM_230 #2 BLKHLWTP_115-COBLKTP_115 BOYD_115-LONTRETP_115 BRIGHTNW_115-SANDCRK_115 LAPORTAP_230-COLLEGLK_230 COBBLKTP_115-TIMNATH_115 DEL CTAP_115-MEADOW_115 DIXON CK_115-HRSTHTAP_115 ESTES_115-POLEHILL_115 FLATIRON_115-HRSTHTAP_115 HARMONY_230-TIMBERLN_230 HORSESHO_115-CROSSRDS_115 HYGIENE_115-LYONS_115 LAPORTE_115-LAPORTAP_115 LNGMNTNW_115-MEADOW_115 LOVE W_115-LOVEWTAP_115 NUNN_115-ROCKPRTP_115 RAWHIDE_230-TIMBERLN_230 TERRY_115-CNTYLINE_115 TIMNATH_115-BOXELDER_115 BRUSH_SS_115-QF_BCP2T_13.8 #U2 BRUSH_SS_115-QF_B4D4T_12.5 #U4 FTLUPTON_230-JMSHAFR1_13.8 #U3 GREELEY_115-GREELEY1_46.0 #T2 PAWNEE_230-MANCHEF2_16.0 #U2 SMOKYHIL_230-SMOKYHIL_345 #T5 ST.VR_4_18.0-ST.VRAIN_230 #U4 UNC_115-QF UNC_13.8 #U1 RAWHIDEF_18.0-RAWHIDE_230 #UF HENRYLAK_230-HENRYLAK_115 #T1 PTZLOGN_230-PTZLOGN4_34.5 #U4 CEDARCRK_230-CEDARCK3_34.5 #U3 AULT_230-AULT_345 #3 DIXON CK_115-DIXON CK_230 ESTES_115-ESTES3_6.90 FORDHAM_115-FORDHAM_230 #2 LONGPEAK_115-LONGPEAK_230 TIMBERLN_115-TIMBERLN_230 #2 MARYLSB_115-MARYLSB_69.0 MIS_SITE_345-MIS_SITE_230-MS_STE_13.8 #T1 ***VY-WE-FI 3-Terminal_115 ***WLD WA Bus Tie or BKRFAIL_230 ***AU-WLD 2-CKT_230 ***RH-TP & CRY-AU 2-CKT_230 ***LI-RL & LATP-3-term 2-CKT_115_230 ***AU BKR 1986 WLD & RH_230 ***TP BKR 2186 T1 & AU_230 ***LP BKR 2282 T1 & BYD_230
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ST.VRAIN_230-WELD_PS_230
AULT_230-WINDSOR_230
ST.VRAIN_230-LONGPEAK_230
AULT_230-WELD LM_230
BOYD_230-LONGPEAK_230
BOYD_230-PORTNER_230
AULT_230-TIMBERLN_230
HARMONY_230-TIMBERLN_230
HARMONY_230-PORTNER_230
***WLD WA Bus Tie or BKRFAIL_230
***WLD PS BKR 5221 WLD_115_AU_230
***WLD Bus Tie or BKRFAIL_115
***DX-HS & DX-FI 2-CKT_115_230
***AU-WLD 2-CKT_230
***RH E 2-CKT_230
***RH-AU-CRY 3-CKT_230
***RH-TP & CRY-AU 2-CKT_230
***RH-AU & CRY-AU 2-CKT_230
***HY-TP & DK-TP 2-CKT_115_230
***AU BKR 1986 WLD & RH_230
***AU BKR 2186 CRY & WI_230
***TP BKR 1282 HY & LATP-3-term_230
***TP BKR 2186 T1 & AU_230
***BYD BKR 1186 T1 & LP_230
***FSV W 2-CKT_LP_FD_230

Exhibit 9



18HS_AVERY
 T7=105.5;T7A=219.9;T3=637.6;T5=549.7;RAWH=619.8;CBT=89.0;
 TUE, AUG 26 2014 15:35

Bus - VOLTAGE (PU)
 Branch - MW/Mvar
 Equipment - MW/Mvar
 100.0%RATEA
 1.045OV 0.950UV
 kV: <=115.000 <=230.000 <=345.000 >345.000

SI
SYSTEM INTACT INITIAL CONDITIONS :
T7=105.5;T7A=219.8;T3=637.6;T5=549.8;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: ROSEDALE 115.00 (0.995) / LONGPEAK 115.00 (1.04)
HIGHEST LINE LOAD: GREELEY 115.00-WELD_PS 115.00 #1 82.5% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 76.7% OF 100.0 MVA RATING

30_RIVERDAL 230.-HENRYLAK 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 0 LINE; 1 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

HENRYLAK 230.00-HENRYLAK 115.00 #T1 102.0 / 102.0 / 100.0

43_WELD_PS 115.-ARROWHLK 115. #1 LINE TOTAL VIOLATIONS: 0 BUS; 2 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GREELEY 115.00-MONFORT 115.00 #1 115.3 / 138.3 / 120.0
GREELEY 115.00-WELD_PS 115.00 #1 113.1 / 204.7 / 181.0

249_WLD PS BKR 5221 WLD_115_AU_230 TOTAL VIOLATIONS: 16 BUS; 4 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GODFRET 115.00 0.881 LO AIRPORT 115.00-BOYD 115.00 #1 203.5 / 337.7 / 166.0
GREELEY 115.00 0.88 LO AIRPORT 115.00-WINDSORT 115.00 #1 172.8 / 286.8 / 166.0
JOHNSTN 115.00 0.881 LO WELD LM 115.00-WHITNEY 115.00 #1 141.8 / 235.4 / 166.0
JOHNSTN2 115.00 0.881 LO WINDSORT 115.00-WHITNEY 115.00 #1 165.3 / 274.3 / 166.0
MONFORT 115.00 0.872 LO
ROSEDALE 115.00 0.862 LO
UNC 115.00 0.869 LO
WELD_PS 115.00 0.889 LO
ARROWHLK 115.00 0.868 LO
KODAK 115.00 0.902 LO
WELD LM 115.00 0.89 LO
WINDSOR 115.00 0.915 LO
WINDSORT 115.00 0.915 LO
BOOMERNG 115.00 0.892 LO
BRACEWLL 115.00 0.902 LO
WHITNEY 115.00 0.902 LO

267_TP BKR 1186 LATP-3-term & RH_230 TOTAL VIOLATIONS: 0 BUS; 0 LINE; 1 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

LAPORTE 115.00-LAPORTE 230.00 #1 106.3 / 195.5 / 184.0

NSD395_CONTRATET7
NORTH-SOUTH FLOW DECREASE 395MW : CONTINUOUS T7 FACILITY RATINGS USED :
T7=516.7;T7A=530.2;T3=868.6;T5=944.3;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: JLGREEN 230.00 (0.996) / LONGPEAK 115.00 (1.036)
HIGHEST LINE LOAD: GREELEY 115.00-WELD_PS 115.00 #1 84.4% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 81.7% OF 100.0 MVA RATING

4_AULT 230.-WELD LM 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR
BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE
AULT 230.00-WELD LM 230.00 #2 100.0 / 512.5 / 512.7

10_WLD WA Bus Tie or BKRFAIL_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR
BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE
AIRPORT 115.00-BOYD 115.00 #1 111.5 / 185.0 / 166.0

11_WLD PS BKR 5221 WLD_115_AU_230 TOTAL VIOLATIONS: 15 BUS; 4 LINE; 0 XFMR
BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE
GODFRETP 115.00 0.892 LO AIRPORT 115.00-BOYD 115.00 #1 200.0 / 331.9 / 166.0
GREELEY 115.00 0.892 LO AIRPORT 115.00-WINDSORT 115.00 #1 169.5 / 281.5 / 166.0
JOHNSTN 115.00 0.892 LO WELD LM 115.00-WHITNEY 115.00 #1 139.0 / 230.7 / 166.0
JOHNSTN2 115.00 0.892 LO WINDSORT 115.00-WHITNEY 115.00 #1 162.0 / 269.0 / 166.0
MONFORT 115.00 0.888 LO
ROSEDALE 115.00 0.877 LO
UNC 115.00 0.884 LO
WELD_PS 115.00 0.9 LO
ARROWHLK 115.00 0.88 LO
KODAK 115.00 0.909 LO
WELD LM 115.00 0.9 LO
WINDSOR 115.00 0.92 LO
BOOMERNG 115.00 0.902 LO
BRACEWLL 115.00 0.909 LO
WHITNEY 115.00 0.909 LO

14_AU-WLD 2-CKT_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR
BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE
AIRPORT 115.00-BOYD 115.00 #1 100.3 / 166.5 / 166.0

16_RH-AU-CRY 3-CKT_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR
BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE
LAPORTAP 230.00-RAWHIDE 230.00 #1 96.3 / 454.7 / 472.0

20_AU BKR 1986 WLD & RH_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR
BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE
AULT 230.00-WELD LM 230.00 #2 97.7 / 500.8 / 512.7

NSD90_EMERGRATET7
NORTH-SOUTH FLOW DECREASE 90MW : EMERGENCY T7 FACILITY RATINGS USED :
T7=702.6;T7A=671.2;T3=1045.4;T5=988.2;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: ROSEDALE 115.00 (0.99) / PAWNEE 230.00 (1.033)
HIGHEST LINE LOAD: GREELEY 115.00-WELD_PS 115.00 #1 84.8% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 81.6% OF 100.0 MVA RATING

10_WLD WA Bus Tie or BKRFAIL_230 TOTAL VIOLATIONS: 0 BUS; 2 LINE; 0 XFMR
BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE
AIRPORT 115.00-BOYD 115.00 #1 119.5 / 198.4 / 166.0
HARMONY 230.00-PORTNER 230.00 #1 98.6 / 465.3 / 472.0

11_WLD PS BKR 5221 WLD_115_AU_230 TOTAL VIOLATIONS: 16 BUS; 6 LINE; 0 XFMR
BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE
GODFRETP 115.00 0.88 LO AIRPORT 115.00-BOYD 115.00 #1 202.5 / 336.1 / 166.0
GREELEY 115.00 0.88 LO AIRPORT 115.00-WINDSORT 115.00 #1 171.7 / 285.0 / 166.0
JOHNSTN 115.00 0.88 LO BOYD 230.00-PORTNER 230.00 #1 95.1 / 448.7 / 472.0
JOHNSTN2 115.00 0.88 LO HARMONY 230.00-PORTNER 230.00 #1 100.2 / 473.2 / 472.0
MONFORT 115.00 0.876 LO WELD LM 115.00-WHITNEY 115.00 #1 140.7 / 233.6 / 166.0
ROSEDALE 115.00 0.864 LO WINDSORT 115.00-WHITNEY 115.00 #1 164.1 / 272.4 / 166.0
UNC 115.00 0.871 LO
WELD_PS 115.00 0.888 LO
ARROWHLK 115.00 0.868 LO
KODAK 115.00 0.897 LO
WELD LM 115.00 0.888 LO
WINDSOR 115.00 0.909 LO
WINDSORT 115.00 0.909 LO
BOOMERNG 115.00 0.89 LO
BRACEWLL 115.00 0.897 LO
WHITNEY 115.00 0.897 LO

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14_AU-WLD 2-CKT_230		TOTAL VIOLATIONS:		0 BUS;	2 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE			
AIRPORT	115.00-BOYD	115.00 #1	109.4 / 181.6 / 166.0			
HARMONY	230.00-PORTNER	230.00 #1	98.4 / 464.2 / 472.0			

15_RH E 2-CKT_230		TOTAL VIOLATIONS:		0 BUS;	1 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE			
LAPORTAP	230.00-RAWHIDE	230.00 #1	95.4 / 450.1 / 472.0			

16_RH-AU-CRY 3-CKT_230		TOTAL VIOLATIONS:		0 BUS;	1 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE			
LAPORTAP	230.00-RAWHIDE	230.00 #1	97.1 / 458.4 / 472.0			

21_AU BKR 2186 CRY & WI_230		TOTAL VIOLATIONS:		0 BUS;	2 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE			
ST.VRAIN	230.00-WELD_PS	230.00 #1	98.4 / 564.7 / 574.0			
WELD_PS	230.00-WELD LM	230.00 #1	96.8 / 771.4 / 797.0			

RATVER_EMERGRATET7
VERIFY T7 890 RATING : EMERGENCY T7 FACILITY RATINGS USED :
T7=891.5;T7A=717.7;T3=987.8;T5=932.7;RAWH=251.0;CBT=89.5;

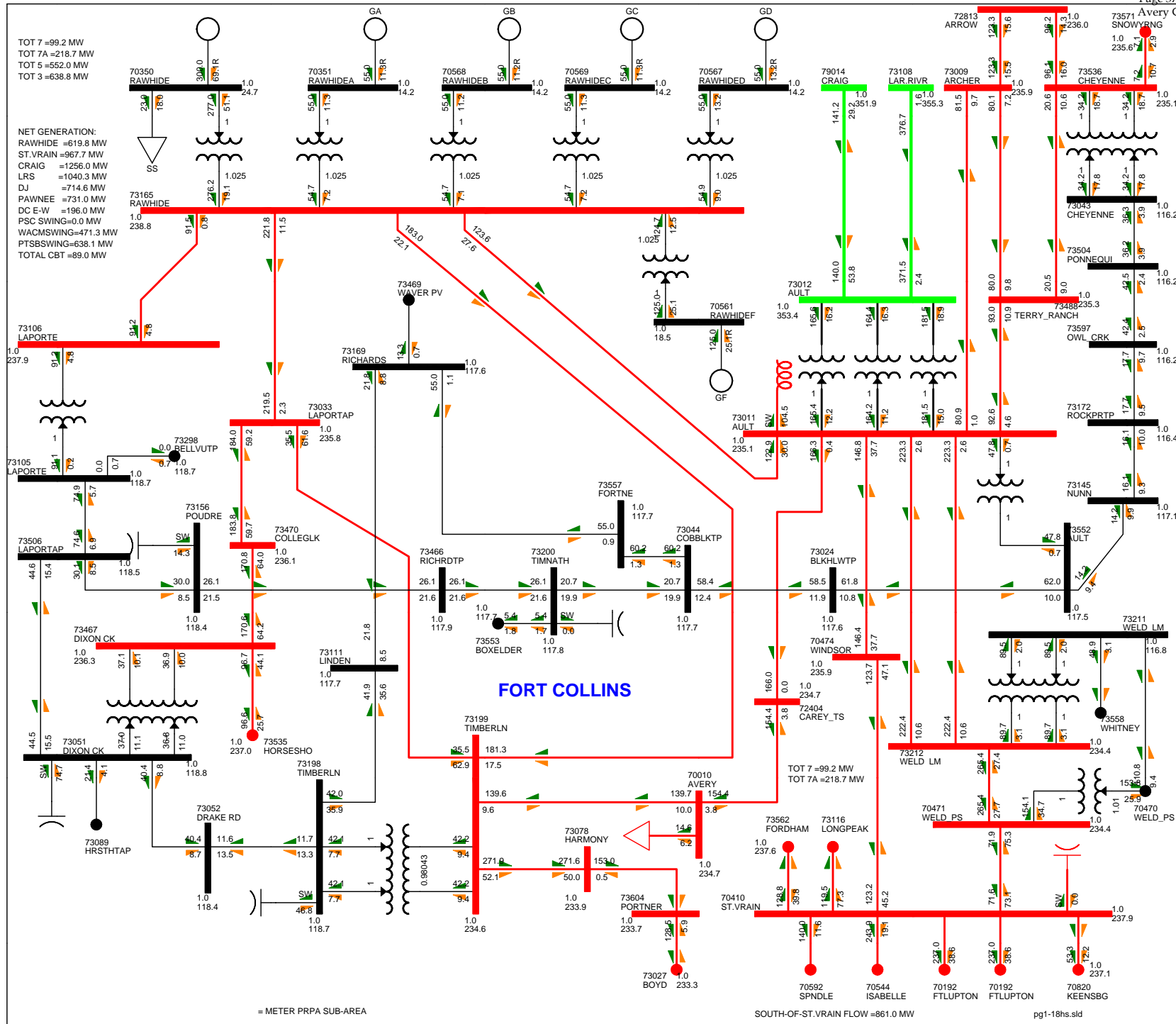
SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: JLGREEN 230.00 (0.994) / ESTES 115.00 (1.044)
HIGHEST LINE LOAD: COORSREC 115.00-FTLUPTON 115.00 #1 78.9% OF 120.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 74.3% OF 100.0 MVA RATING

10_WLD WA Bus Tie or BKRFAIL_230		TOTAL VIOLATIONS:		0 BUS;	4 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE			
AIRPORT	115.00-BOYD	115.00 #1	112.6 / 187.0 / 166.0			
AIRPORT	115.00-WINDSORT	115.00 #1	105.4 / 175.0 / 166.0			
WELD LM	115.00-WHITNEY	115.00 #1	98.1 / 162.8 / 166.0			
WINDSORT	115.00-WHITNEY	115.00 #1	103.4 / 171.7 / 166.0			

11_WLD PS BKR 5221 WLD_115_AU_230		TOTAL VIOLATIONS:		0 BUS;	4 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE			
AIRPORT	115.00-BOYD	115.00 #1	145.9 / 242.2 / 166.0			
AIRPORT	115.00-WINDSORT	115.00 #1	138.2 / 229.4 / 166.0			
WELD LM	115.00-WHITNEY	115.00 #1	130.4 / 216.5 / 166.0			
WINDSORT	115.00-WHITNEY	115.00 #1	136.1 / 226.0 / 166.0			

14_AU-WLD 2-CKT_230		TOTAL VIOLATIONS:		0 BUS;	3 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE			
AIRPORT	115.00-BOYD	115.00 #1	107.6 / 178.7 / 166.0			
AIRPORT	115.00-WINDSORT	115.00 #1	100.3 / 166.6 / 166.0			
WINDSORT	115.00-WHITNEY	115.00 #1	98.3 / 163.2 / 166.0			

21_AU BKR 2186 CRY & WI_230		TOTAL VIOLATIONS:		0 BUS;	1 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE			
ST.VRAIN	230.00-WELD_PS	230.00 #1	100.0 / 574.0 / 574.0			



SI
SYSTEM INTACT INITIAL CONDITIONS :
T7=99.2;T7A=218.7;T3=638.8;T5=552.0;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: ROSEDALE 115.00 (0.995) / LONGPEAK 115.00 (1.04)
HIGHEST LINE LOAD: GREELEY 115.00-WELD_PS 115.00 #1 82.5% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 76.7% OF 100.0 MVA RATING

32_RIVERDAL 230.-HENRYLAK 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 0 LINE; 1 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

HENRYLAK 230.00-HENRYLAK 115.00 #T1 101.9 / 101.9 / 100.0

45_WELD_PS 115.-ARROWHLK 115. #1 LINE TOTAL VIOLATIONS: 0 BUS; 2 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GREELEY 115.00-MONFORT 115.00 #1 115.3 / 138.4 / 120.0
GREELEY 115.00-WELD_PS 115.00 #1 113.1 / 204.8 / 181.0

250_WLD PS BKR 5221 WLD_115_AU_230 TOTAL VIOLATIONS: 16 BUS; 4 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GODFRETP 115.00 0.88 LO AIRPORT 115.00-BOYD 115.00 #1 203.2 / 337.4 / 166.0
GREELEY 115.00 0.879 LO AIRPORT 115.00-WINDSORT 115.00 #1 172.5 / 286.4 / 166.0
JOHNSTN 115.00 0.88 LO WELD LM 115.00-WHITNEY 115.00 #1 141.5 / 234.9 / 166.0
JOHNSTN2 115.00 0.88 LO WINDSORT 115.00-WHITNEY 115.00 #1 165.0 / 273.9 / 166.0
MONFORT 115.00 0.871 LO
ROSEDALE 115.00 0.861 LO
UNC 115.00 0.868 LO
WELD_PS 115.00 0.888 LO
ARROWHLK 115.00 0.867 LO
KODAK 115.00 0.901 LO
WELD LM 115.00 0.889 LO
WINDSOR 115.00 0.914 LO
WINDSORT 115.00 0.915 LO
BOOMERNG 115.00 0.891 LO
BRACEWLL 115.00 0.901 LO
WHITNEY 115.00 0.901 LO

270_TP BKR 1186 LATP-3-term & RH_230 TOTAL VIOLATIONS: 0 BUS; 0 LINE; 1 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

LAPORTE 115.00-LAPORTE 230.00 #1 107.2 / 197.2 / 184.0

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NSD410_CONTRATET7
NORTH-SOUTH FLOW DECREASE 410MW : CONTINUOUS T7 FACILITY RATINGS USED :
T7=501.1;T7A=523.3;T3=861.0;T5=944.7;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: JLGREEN 230.00 (0.996) / LONGPEAK 115.00 (1.036)
HIGHEST LINE LOAD: GREELEY 115.00-WELD_PS 115.00 #1 84.4% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 81.6% OF 100.0 MVA RATING

4_AULT 230.-WELD LM 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AULT 230.00-WELD LM 230.00 #2 100.0 / 512.8 / 512.7

10_WLD WA Bus Tie or BKRFAIL_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AIRPORT 115.00-BOYD 115.00 #1 109.7 / 182.1 / 166.0

11_WLD PS BKR 5221 WLD_115_AU_230 TOTAL VIOLATIONS: 15 BUS; 4 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GODFRETP 115.00 0.892 LO AIRPORT 115.00-BOYD 115.00 #1 199.5 / 331.2 / 166.0
GREELEY 115.00 0.892 LO AIRPORT 115.00-WINDSORT 115.00 #1 169.1 / 280.7 / 166.0
JOHNSTN 115.00 0.891 LO WELD LM 115.00-WHITNEY 115.00 #1 138.5 / 229.9 / 166.0
JOHNSTN2 115.00 0.891 LO WINDSORT 115.00-WHITNEY 115.00 #1 161.6 / 268.2 / 166.0
MONFORT 115.00 0.887 LO
ROSEDALE 115.00 0.876 LO
UNC 115.00 0.883 LO
WELD_PS 115.00 0.899 LO
ARROWHLK 115.00 0.88 LO
KODAK 115.00 0.908 LO
WELD LM 115.00 0.899 LO
WINDSOR 115.00 0.92 LO
BOOMERNG 115.00 0.901 LO
BRACEWLL 115.00 0.908 LO
WHITNEY 115.00 0.908 LO

15_AU-WLD 2-CKT_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AIRPORT 115.00-BOYD 115.00 #1 98.4 / 163.3 / 166.0

17_RH-AU-CRY 3-CKT_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

LAPORTAP 230.00-RAWHIDE 230.00 #1 96.6 / 455.7 / 472.0

21_AU BKR 1986 WLD & RH_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AULT 230.00-WELD LM 230.00 #2 97.7 / 501.0 / 512.7

NSD70_EMERGRATET7
NORTH-SOUTH FLOW DECREASE 70MW : EMERGENCY T7 FACILITY RATINGS USED :
T7=708.3;T7A=681.2;T3=1058.1;T5=993.8;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: ROSEDALE 115.00 (0.989) / PAWNEE 230.00 (1.033)
HIGHEST LINE LOAD: GREELEY 115.00-WELD_PS 115.00 #1 84.9% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 81.5% OF 100.0 MVA RATING

4_AULT 230.-WELD LM 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AULT 230.00-WELD LM 230.00 #2 95.7 / 594.4 / 621.0

10_WLD WA Bus Tie or BKRFAIL_230 TOTAL VIOLATIONS: 0 BUS; 3 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

WINDSOR 230.00-AULT 230.00 #1 96.1 / 606.1 / 631.0
AIRPORT 115.00-BOYD 115.00 #1 118.5 / 196.8 / 166.0
HARMONY 230.00-PORTNER 230.00 #1 96.6 / 456.2 / 472.0

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11_WLD PS BKR 5221 WLD_115_AU_230				TOTAL VIOLATIONS:	16 BUS;	6 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME					OL%/FLOW/RATE
GODFRETP	115.00 0.878 LO	GREELEY	115.00-WELD_PS	115.00 #1			95.2 / 172.3 / 181.0
GREELEY	115.00 0.878 LO	AIRPORT	115.00-BOYD	115.00 #1			202.3 / 335.8 / 166.0
JOHNSTN	115.00 0.878 LO	AIRPORT	115.00-WINDSORT	115.00 #1			171.4 / 284.6 / 166.0
JOHNSTN2	115.00 0.878 LO	HARMONY	230.00-PORTNER	230.00 #1			98.2 / 463.5 / 472.0
MONFORT	115.00 0.874 LO	WELD LM	115.00-WHITNEY	115.00 #1			140.4 / 233.0 / 166.0
ROSEDALE	115.00 0.863 LO	WINDSORT	115.00-WHITNEY	115.00 #1			163.8 / 271.9 / 166.0
UNC	115.00 0.87 LO						
WELD_PS	115.00 0.886 LO						
ARROWHLK	115.00 0.866 LO						
KODAK	115.00 0.896 LO						
WELD LM	115.00 0.886 LO						
WINDSOR	115.00 0.907 LO						
WINDSORT	115.00 0.908 LO						
BOOMERNG	115.00 0.888 LO						
BRACEWLL	115.00 0.895 LO						
WHITNEY	115.00 0.896 LO						

15_AU-WLD 2-CKT_230				TOTAL VIOLATIONS:	0 BUS;	3 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME					OL%/FLOW/RATE
		WINDSOR	230.00-AULT	230.00 #1			96.7 / 609.9 / 631.0
		AIRPORT	115.00-BOYD	115.00 #1			108.3 / 179.8 / 166.0
		HARMONY	230.00-PORTNER	230.00 #1			96.4 / 455.2 / 472.0

16_RH E 2-CKT_230				TOTAL VIOLATIONS:	0 BUS;	1 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME					OL%/FLOW/RATE
		LAPORTAP	230.00-RAWHIDE	230.00 #1			95.6 / 451.4 / 472.0

17_RH-AU-CRY 3-CKT_230				TOTAL VIOLATIONS:	0 BUS;	1 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME					OL%/FLOW/RATE
		LAPORTAP	230.00-RAWHIDE	230.00 #1			97.4 / 459.9 / 472.0

22_AU BKR 2186 CRY & WI_230				TOTAL VIOLATIONS:	0 BUS;	2 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME					OL%/FLOW/RATE
		ST.VRAIN	230.00-WELD_PS	230.00 #1			99.9 / 573.6 / 574.0
		WELD_PS	230.00-WELD LM	230.00 #1			98.0 / 781.2 / 797.0

RATVER_EMERGRATET7
VERIFY T7 890 RATING : EMERGENCY T7 FACILITY RATINGS USED :
T7=889.6;T7A=720.9;T3=988.8;T5=935.2;RAWH=251.0;CBT=89.5;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: JLGREEN 230.00 (0.994) / ESTES 115.00 (1.044)
HIGHEST LINE LOAD: COORSREC 115.00-FTLUPTON 115.00 #1 78.9% OF 120.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 74.4% OF 100.0 MVA RATING

10_WLD WA Bus Tie or BKRFAIL_230				TOTAL VIOLATIONS:	0 BUS;	4 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME					OL%/FLOW/RATE
		AIRPORT	115.00-BOYD	115.00 #1			111.6 / 185.3 / 166.0
		AIRPORT	115.00-WINDSORT	115.00 #1			104.3 / 173.2 / 166.0
		WELD LM	115.00-WHITNEY	115.00 #1			96.9 / 160.8 / 166.0
		WINDSORT	115.00-WHITNEY	115.00 #1			102.3 / 169.8 / 166.0

11_WLD PS BKR 5221 WLD_115_AU_230				TOTAL VIOLATIONS:	0 BUS;	4 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME					OL%/FLOW/RATE
		AIRPORT	115.00-BOYD	115.00 #1			145.7 / 241.9 / 166.0
		AIRPORT	115.00-WINDSORT	115.00 #1			137.9 / 228.9 / 166.0
		WELD LM	115.00-WHITNEY	115.00 #1			130.0 / 215.8 / 166.0
		WINDSORT	115.00-WHITNEY	115.00 #1			135.8 / 225.5 / 166.0

15_AU-WLD 2-CKT_230				TOTAL VIOLATIONS:	0 BUS;	3 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME					OL%/FLOW/RATE
		AIRPORT	115.00-BOYD	115.00 #1			106.5 / 176.8 / 166.0
		AIRPORT	115.00-WINDSORT	115.00 #1			99.1 / 164.5 / 166.0
		WINDSORT	115.00-WHITNEY	115.00 #1			97.1 / 161.1 / 166.0

22_AU BKR 2186 CRY & WI_230				TOTAL VIOLATIONS:	0 BUS;	1 LINE;	0 XFMR
BUS NAME	VOLT/DELTA	LINE/XFMR NAME					OL%/FLOW/RATE
		ST.VRAIN	230.00-WELD_PS	230.00 #1			100.2 / 574.9 / 574.0

SI
SYSTEM INTACT INITIAL CONDITIONS :
T7=99.0;T7A=221.6;T3=638.6;T5=552.2;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: ROSEDALE 115.00 (0.995) / LONGPEAK 115.00 (1.04)
HIGHEST LINE LOAD: GREELEY 115.00-WELD_PS 115.00 #1 82.5% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 76.7% OF 100.0 MVA RATING

32_RIVERDAL 230.-HENRYLAK 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 0 LINE; 1 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

HENRYLAK 230.00-HENRYLAK 115.00 #T1 101.9 / 101.9 / 100.0

45_WELD_PS 115.-ARROWHLK 115. #1 LINE TOTAL VIOLATIONS: 0 BUS; 2 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GREELEY 115.00-MONFORT 115.00 #1 115.3 / 138.4 / 120.0
GREELEY 115.00-WELD_PS 115.00 #1 113.1 / 204.8 / 181.0

250_WLD PS BKR 5221 WLD_115_AU_230 TOTAL VIOLATIONS: 16 BUS; 4 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GODFRETP 115.00 0.879 LO AIRPORT 115.00-BOYD 115.00 #1 203.1 / 337.1 / 166.0
GREELEY 115.00 0.879 LO AIRPORT 115.00-WINDSORT 115.00 #1 172.3 / 286.1 / 166.0
JOHNSTN 115.00 0.879 LO WELD LM 115.00-WHITNEY 115.00 #1 141.3 / 234.6 / 166.0
JOHNSTN2 115.00 0.879 LO WINDSORT 115.00-WHITNEY 115.00 #1 164.8 / 273.6 / 166.0
MONFORT 115.00 0.87 LO
ROSEDALE 115.00 0.861 LO
UNC 115.00 0.867 LO
WELD_PS 115.00 0.888 LO
ARROWHLK 115.00 0.866 LO
KODAK 115.00 0.9 LO
WELD LM 115.00 0.888 LO
WINDSOR 115.00 0.914 LO
WINDSORT 115.00 0.914 LO
BOOMERNG 115.00 0.891 LO
BRACEWLL 115.00 0.9 LO
WHITNEY 115.00 0.9 LO

270_TP BKR 1186 LATP-3-term & RH_230 TOTAL VIOLATIONS: 0 BUS; 0 LINE; 1 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

LAPORTE 115.00-LAPORTE 230.00 #1 108.2 / 199.1 / 184.0

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NSD425_CONTRATET7

NORTH-SOUTH FLOW DECREASE 425MW : CONTINUOUS T7 FACILITY RATINGS USED :

T7=491.7;T7A=520.4;T3=852.1;T5=942.8;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: JLGREEN 230.00 (0.996) / LONGPEAK 115.00 (1.036)
HIGHEST LINE LOAD: GRELEY 115.00-WELD_PS 115.00 #1 84.4% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 81.6% OF 100.0 MVA RATING

4_AULT 230.-WELD LM 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AULT 230.00-WELD LM 230.00 #2 100.0 / 512.9 / 512.7

10_WLD WA Bus Tie or BKRFAIL_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AIRPORT 115.00-BOYD 115.00 #1 108.4 / 179.9 / 166.0

11_WLD PS BKR 5221 WLD_115_AU_230 TOTAL VIOLATIONS: 15 BUS; 4 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GODFRETP 115.00 0.892 LO AIRPORT 115.00-BOYD 115.00 #1 199.1 / 330.6 / 166.0
GRELEY 115.00 0.892 LO AIRPORT 115.00-WINDSORT 115.00 #1 168.7 / 280.1 / 166.0
JOHNSTN 115.00 0.892 LO WELD LM 115.00-WHITNEY 115.00 #1 138.1 / 229.3 / 166.0
JOHNSTN2 115.00 0.892 LO WINDSORT 115.00-WHITNEY 115.00 #1 161.2 / 267.6 / 166.0
MONFORT 115.00 0.887 LO
ROSEDALE 115.00 0.876 LO
UNC 115.00 0.883 LO
WELD_PS 115.00 0.899 LO
ARROWHLK 115.00 0.88 LO
KODAK 115.00 0.908 LO
WELD LM 115.00 0.899 LO
WINDSOR 115.00 0.92 LO
BOOMERNG 115.00 0.901 LO
BRACEWLL 115.00 0.908 LO
WHITNEY 115.00 0.909 LO

15_AU-WLD 2-CKT_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AIRPORT 115.00-BOYD 115.00 #1 96.9 / 160.8 / 166.0

17_RH-AU-CRY 3-CKT_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

LAPORTAP 230.00-RAWHIDE 230.00 #1 96.5 / 455.5 / 472.0

21_AU BKR 1986 WLD & RH_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AULT 230.00-WELD LM 230.00 #2 97.7 / 501.0 / 512.7

NSD70_EMERGRATET7

NORTH-SOUTH FLOW DECREASE 70MW : EMERGENCY T7 FACILITY RATINGS USED :

T7=708.0;T7A=685.8;T3=1057.8;T5=994.1;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: ROSEDALE 115.00 (0.989) / PAWNEE 230.00 (1.033)
HIGHEST LINE LOAD: GRELEY 115.00-WELD_PS 115.00 #1 84.9% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 81.5% OF 100.0 MVA RATING

4_AULT 230.-WELD LM 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AULT 230.00-WELD LM 230.00 #2 96.4 / 598.7 / 621.0

10_WLD WA Bus Tie or BKRFAIL_230 TOTAL VIOLATIONS: 0 BUS; 2 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

WINDSOR 230.00-AULT 230.00 #1 97.2 / 613.0 / 631.0
AIRPORT 115.00-BOYD 115.00 #1 117.4 / 194.9 / 166.0

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11_WLD PS BKR 5221 WLD_115_AU_230

TOTAL VIOLATIONS: 16 BUS; 6 LINE; 0 XFMR

BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE
GODFRETP	115.00 0.878 LO	GREELEY 115.00-WELD_PS 115.00 #1	95.2 / 172.3 / 181.0
GREELEY	115.00 0.878 LO	AIRPORT 115.00-BOYD 115.00 #1	202.0 / 335.3 / 166.0
JOHNSTN	115.00 0.878 LO	AIRPORT 115.00-WINDSORT 115.00 #1	171.1 / 284.0 / 166.0
JOHNSTN2	115.00 0.878 LO	HARMONY 230.00-PORTNER 230.00 #1	96.0 / 453.3 / 472.0
MONFORT	115.00 0.873 LO	WELD LM 115.00-WHITNEY 115.00 #1	140.0 / 232.4 / 166.0
ROSEDALE	115.00 0.862 LO	WINDSORT 115.00-WHITNEY 115.00 #1	163.5 / 271.4 / 166.0
UNC	115.00 0.869 LO		
WELD_PS	115.00 0.885 LO		
ARROWHLK	115.00 0.866 LO		
KODAK	115.00 0.895 LO		
WELD LM	115.00 0.886 LO		
WINDSOR	115.00 0.907 LO		
WINDSORT	115.00 0.907 LO		
BOOMERNG	115.00 0.888 LO		
BRACEWLL	115.00 0.895 LO		
WHITNEY	115.00 0.895 LO		

15_AU-WLD 2-CKT_230

TOTAL VIOLATIONS: 0 BUS; 3 LINE; 0 XFMR

BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE
ST.VRAIN	230.00-WINDSOR 230.00 #1	95.3 / 595.7 / 625.0	
WINDSOR	230.00-AULT 230.00 #1	97.7 / 616.8 / 631.0	
AIRPORT	115.00-BOYD 115.00 #1	107.1 / 177.8 / 166.0	

16_RH E 2-CKT_230

TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE
LAPORTAP	230.00-RAWHIDE 230.00 #1	95.7 / 451.8 / 472.0	

17_RH-AU-CRY 3-CKT_230

TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE
LAPORTAP	230.00-RAWHIDE 230.00 #1	97.4 / 459.8 / 472.0	

22_AU BKR 2186 CRY & WI_230

TOTAL VIOLATIONS: 0 BUS; 2 LINE; 0 XFMR

BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE
ST.VRAIN	230.00-WELD_PS 230.00 #1	99.9 / 573.6 / 574.0	
WELD_PS	230.00-WELD LM 230.00 #1	98.0 / 781.1 / 797.0	

RATVER_EMERGRATET7
VERIFY T7 890 RATING : EMERGENCY T7 FACILITY RATINGS USED :
T7=889.5;T7A=724.2;T3=988.6;T5=935.4;RAWH=251.0;CBT=89.5;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: JLGREEN 230.00 (0.994) / ESTES 115.00 (1.044)
HIGHEST LINE LOAD: COORSREC 115.00-FTLUPTON 115.00 #1 78.9% OF 120.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 74.4% OF 100.0 MVA RATING

10_WLD WA Bus Tie or BKRFAIL_230

TOTAL VIOLATIONS: 0 BUS; 4 LINE; 0 XFMR

BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE
AIRPORT	115.00-BOYD 115.00 #1	110.7 / 183.8 / 166.0	
AIRPORT	115.00-WINDSORT 115.00 #1	103.4 / 171.6 / 166.0	
WELD LM	115.00-WHITNEY 115.00 #1	95.9 / 159.2 / 166.0	
WINDSORT	115.00-WHITNEY 115.00 #1	101.3 / 168.2 / 166.0	

11_WLD PS BKR 5221 WLD_115_AU_230

TOTAL VIOLATIONS: 0 BUS; 4 LINE; 0 XFMR

BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE
AIRPORT	115.00-BOYD 115.00 #1	145.4 / 241.3 / 166.0	
AIRPORT	115.00-WINDSORT 115.00 #1	137.5 / 228.3 / 166.0	
WELD LM	115.00-WHITNEY 115.00 #1	129.6 / 215.2 / 166.0	
WINDSORT	115.00-WHITNEY 115.00 #1	135.4 / 224.8 / 166.0	

15_AU-WLD 2-CKT_230

TOTAL VIOLATIONS: 0 BUS; 3 LINE; 0 XFMR

BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE
AIRPORT	115.00-BOYD 115.00 #1	105.5 / 175.1 / 166.0	
AIRPORT	115.00-WINDSORT 115.00 #1	98.1 / 162.8 / 166.0	
WINDSORT	115.00-WHITNEY 115.00 #1	96.0 / 159.4 / 166.0	

22_AU BKR 2186 CRY & WI_230

TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME	VOLT/DELTA	LINE/XFMR NAME	OL%/FLOW/RATE
ST.VRAIN	230.00-WELD_PS 230.00 #1	100.2 / 574.9 / 574.0	

SI
SYSTEM INTACT INITIAL CONDITIONS :
T7=99.1;T7A=221.0;T3=638.7;T5=552.1;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: ROSEDALE 115.00 (0.995) / LONGPEAK 115.00 (1.04)
HIGHEST LINE LOAD: GREELEY 115.00-WELD_PS 115.00 #1 82.5% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 76.7% OF 100.0 MVA RATING

32_RIVERDAL 230.-HENRYLAK 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 0 LINE; 1 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

HENRYLAK 230.00-HENRYLAK 115.00 #T1 101.9 / 101.9 / 100.0

45_WELD_PS 115.-ARROWHLK 115. #1 LINE TOTAL VIOLATIONS: 0 BUS; 2 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GREELEY 115.00-MONFORT 115.00 #1 115.3 / 138.4 / 120.0
GREELEY 115.00-WELD_PS 115.00 #1 113.1 / 204.8 / 181.0

250_WLD PS BKR 5221 WLD_115_AU_230 TOTAL VIOLATIONS: 16 BUS; 4 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GODFRET 115.00 0.879 LO AIRPORT 115.00-BOYD 115.00 #1 203.1 / 337.2 / 166.0
GREELEY 115.00 0.879 LO AIRPORT 115.00-WINDSORT 115.00 #1 172.4 / 286.1 / 166.0
JOHNSTN 115.00 0.879 LO WELD LM 115.00-WHITNEY 115.00 #1 141.4 / 234.7 / 166.0
JOHNSTN2 115.00 0.879 LO WINDSORT 115.00-WHITNEY 115.00 #1 164.9 / 273.7 / 166.0
MONFORT 115.00 0.871 LO
ROSEDALE 115.00 0.861 LO
UNC 115.00 0.867 LO
WELD_PS 115.00 0.888 LO
ARROWHLK 115.00 0.866 LO
KODAK 115.00 0.901 LO
WELD LM 115.00 0.888 LO
WINDSOR 115.00 0.914 LO
WINDSORT 115.00 0.914 LO
BOOMERNG 115.00 0.891 LO
BRACEWLL 115.00 0.9 LO
WHITNEY 115.00 0.901 LO

270_TP BKR 1186 LATP-3-term & RH_230 TOTAL VIOLATIONS: 0 BUS; 0 LINE; 1 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

LAPORTE 115.00-LAPORTE 230.00 #1 108.0 / 198.6 / 184.0

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NSD425_CONTRATET7

NORTH-SOUTH FLOW DECREASE 425MW : CONTINUOUS T7 FACILITY RATINGS USED :

T7=491.8;T7A=519.4;T3=852.2;T5=942.8;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: JLGREEN 230.00 (0.996) / LONGPEAK 115.00 (1.036)
HIGHEST LINE LOAD: GREELEY 115.00-WELD_PS 115.00 #1 84.4% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 81.6% OF 100.0 MVA RATING

5_AULT 230.-WELD LM 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AULT 230.00-WELD LM 230.00 #2 99.9 / 511.9 / 512.7

11_WLD WA Bus Tie or BKRFAIL_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AIRPORT 115.00-BOYD 115.00 #1 108.6 / 180.3 / 166.0

12_WLD PS BKR 5221 WLD_115_AU_230 TOTAL VIOLATIONS: 15 BUS; 4 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

GODFRETP 115.00 0.892 LO AIRPORT 115.00-BOYD 115.00 #1 199.2 / 330.7 / 166.0
GREELEY 115.00 0.892 LO AIRPORT 115.00-WINDSORT 115.00 #1 168.8 / 280.2 / 166.0
JOHNSTN 115.00 0.892 LO WELD LM 115.00-WHITNEY 115.00 #1 138.2 / 229.4 / 166.0
JOHNSTN2 115.00 0.892 LO WINDSORT 115.00-WHITNEY 115.00 #1 161.3 / 267.7 / 166.0
MONFORT 115.00 0.887 LO
ROSEDALE 115.00 0.876 LO
UNC 115.00 0.883 LO
WELD_PS 115.00 0.899 LO
ARROWHLK 115.00 0.88 LO
KODAK 115.00 0.909 LO
WELD LM 115.00 0.899 LO
WINDSOR 115.00 0.92 LO
BOOMERNG 115.00 0.901 LO
BRACEWLL 115.00 0.908 LO
WHITNEY 115.00 0.909 LO

15_AU-WLD 2-CKT_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AIRPORT 115.00-BOYD 115.00 #1 97.2 / 161.3 / 166.0

17_RH-AU-AVRY 3-CKT_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

LAPORTAP 230.00-RAWHIDE 230.00 #1 96.5 / 455.5 / 472.0

21_AU BKR 1986 WLD & RH_230 TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AULT 230.00-WELD LM 230.00 #2 97.5 / 500.1 / 512.7

NSD70_EMERGRATET7

NORTH-SOUTH FLOW DECREASE 70MW : EMERGENCY T7 FACILITY RATINGS USED :

T7=708.1;T7A=684.6;T3=1057.9;T5=994.0;RAWH=619.8;CBT=89.0;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: ROSEDALE 115.00 (0.989) / PAWNEE 230.00 (1.033)
HIGHEST LINE LOAD: GREELEY 115.00-WELD_PS 115.00 #1 84.9% OF 181.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 81.5% OF 100.0 MVA RATING

5_AULT 230.-WELD LM 230. #1 LINE TOTAL VIOLATIONS: 0 BUS; 1 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

AULT 230.00-WELD LM 230.00 #2 96.2 / 597.6 / 621.0

11_WLD WA Bus Tie or BKRFAIL_230 TOTAL VIOLATIONS: 0 BUS; 3 LINE; 0 XFMR

BUS NAME VOLT/DELTA LINE/XFMR NAME OL%/FLOW/RATE

WINDSOR 230.00-AULT 230.00 #1 96.9 / 611.2 / 631.0
AIRPORT 115.00-BOYD 115.00 #1 117.7 / 195.4 / 166.0
HARMONY 230.00-PORTNER 230.00 #1 95.2 / 449.2 / 472.0

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12_WLD PS BKR 5221 WLD_115_AU_230				TOTAL VIOLATIONS:			16 BUS; 6 LINE; 0 XFMR		
BUS NAME	VOLT/DELTA	LINE/XFMR NAME				OL%/FLOW/RATE			
GODFRETP	115.00	0.878 LO	GREELEY	115.00-WELD_PS	115.00 #1	95.2 / 172.3 / 181.0			
GREELEY	115.00	0.878 LO	AIRPORT	115.00-BOYD	115.00 #1	202.1 / 335.4 / 166.0			
JOHNSTN	115.00	0.878 LO	AIRPORT	115.00-WINDSORT	115.00 #1	171.2 / 284.2 / 166.0			
JOHNSTN2	115.00	0.878 LO	HARMONY	230.00-PORTNER	230.00 #1	96.6 / 456.1 / 472.0			
MONFORT	115.00	0.873 LO	WELD LM	115.00-WHITNEY	115.00 #1	140.1 / 232.6 / 166.0			
ROSEDALE	115.00	0.862 LO	WINDSORT	115.00-WHITNEY	115.00 #1	163.6 / 271.5 / 166.0			
UNC	115.00	0.869 LO							
WELD_PS	115.00	0.886 LO							
ARROWHLK	115.00	0.866 LO							
KODAK	115.00	0.895 LO							
WELD LM	115.00	0.886 LO							
WINDSOR	115.00	0.907 LO							
WINDSORT	115.00	0.907 LO							
BOOMERNG	115.00	0.888 LO							
BRACEWLL	115.00	0.895 LO							
WHITNEY	115.00	0.895 LO							

15_AU-WLD 2-CKT_230				TOTAL VIOLATIONS:			0 BUS; 3 LINE; 0 XFMR		
BUS NAME	VOLT/DELTA	LINE/XFMR NAME				OL%/FLOW/RATE			
			ST.VRAIN	230.00-WINDSOR	230.00 #1	95.0 / 593.8 / 625.0			
			WINDSOR	230.00-AULT	230.00 #1	97.5 / 614.9 / 631.0			
			AIRPORT	115.00-BOYD	115.00 #1	107.4 / 178.3 / 166.0			

16_RH E 2-CKT_230				TOTAL VIOLATIONS:			0 BUS; 1 LINE; 0 XFMR		
BUS NAME	VOLT/DELTA	LINE/XFMR NAME				OL%/FLOW/RATE			
			LAPORTAP	230.00-RAWHIDE	230.00 #1	95.7 / 451.8 / 472.0			

17_RH-AU-AVRY 3-CKT_230				TOTAL VIOLATIONS:			0 BUS; 1 LINE; 0 XFMR		
BUS NAME	VOLT/DELTA	LINE/XFMR NAME				OL%/FLOW/RATE			
			LAPORTAP	230.00-RAWHIDE	230.00 #1	97.4 / 459.8 / 472.0			

22_AU BKR 2186 AVRY & WI_230				TOTAL VIOLATIONS:			0 BUS; 2 LINE; 0 XFMR		
BUS NAME	VOLT/DELTA	LINE/XFMR NAME				OL%/FLOW/RATE			
			ST.VRAIN	230.00-WELD_PS	230.00 #1	99.9 / 573.6 / 574.0			
			WELD_PS	230.00-WELD LM	230.00 #1	98.0 / 781.2 / 797.0			

RATVER_EMERGRATET7
VERIFY T7 890 RATING : EMERGENCY T7 FACILITY RATINGS USED :
T7=889.6;T7A=723.3;T3=988.7;T5=935.3;RAWH=251.0;CBT=89.5;

SYSTEM INTACT: TOTAL VIOLATIONS: 0 BUS; 0 LINE; 0 XFMR
HIGH/LOW BUS V: JLGREEN 230.00 (0.994) / ESTES 115.00 (1.044)
HIGHEST LINE LOAD: COORSREC 115.00-FTLUPTON 115.00 #1 78.9% OF 120.0 MVA RATING
HIGHEST XFMR LOAD: HENRYLAK 230.00-HENRYLAK 115.00 #T1 74.4% OF 100.0 MVA RATING

11_WLD WA Bus Tie or BKRFAIL_230				TOTAL VIOLATIONS:			0 BUS; 4 LINE; 0 XFMR		
BUS NAME	VOLT/DELTA	LINE/XFMR NAME				OL%/FLOW/RATE			
			AIRPORT	115.00-BOYD	115.00 #1	111.0 / 184.2 / 166.0			
			AIRPORT	115.00-WINDSORT	115.00 #1	103.6 / 172.1 / 166.0			
			WELD LM	115.00-WHITNEY	115.00 #1	96.2 / 159.7 / 166.0			
			WINDSORT	115.00-WHITNEY	115.00 #1	101.6 / 168.7 / 166.0			

12_WLD PS BKR 5221 WLD_115_AU_230				TOTAL VIOLATIONS:			0 BUS; 4 LINE; 0 XFMR		
BUS NAME	VOLT/DELTA	LINE/XFMR NAME				OL%/FLOW/RATE			
			AIRPORT	115.00-BOYD	115.00 #1	145.5 / 241.5 / 166.0			
			AIRPORT	115.00-WINDSORT	115.00 #1	137.7 / 228.5 / 166.0			
			WELD LM	115.00-WHITNEY	115.00 #1	129.7 / 215.4 / 166.0			
			WINDSORT	115.00-WHITNEY	115.00 #1	135.6 / 225.0 / 166.0			

15_AU-WLD 2-CKT_230				TOTAL VIOLATIONS:			0 BUS; 3 LINE; 0 XFMR		
BUS NAME	VOLT/DELTA	LINE/XFMR NAME				OL%/FLOW/RATE			
			AIRPORT	115.00-BOYD	115.00 #1	105.8 / 175.6 / 166.0			
			AIRPORT	115.00-WINDSORT	115.00 #1	98.4 / 163.3 / 166.0			
			WINDSORT	115.00-WHITNEY	115.00 #1	96.3 / 159.9 / 166.0			

22_AU BKR 2186 AVRY & WI_230				TOTAL VIOLATIONS:			0 BUS; 1 LINE; 0 XFMR		
BUS NAME	VOLT/DELTA	LINE/XFMR NAME				OL%/FLOW/RATE			
			ST.VRAIN	230.00-WELD_PS	230.00 #1	100.2 / 574.9 / 574.0			