Avista System Planning Assessment

2015 Local Planning Report

Prepared By: ***Transmission System Planning***

Scott Waples Director, Asset Management and System Planning

Dec 30, 2015
Date

Version History

Version	Version Date	Action	Change Tracking	Reviewed By
0	Dec 30, 2015	2015 Final Version	Revised from 2014	SAW

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I EXECUTIVE SUMMARY

Avista's System Planning Department has completed its annual assessment of the Avista Transmission System as well as select portions of our neighboring transmission systems. The purpose of the Planning Assessment is to determine where the System may have the inability to meet performance requirements as defined in the NERC Reliability Standards and to develop Corrective Action Plans addressing how the performance requirements will be met. Key findings from the assessment include:

Big Bend Area: The Big Bend area transmission system performance will significantly improve upon completion of the Benton – Othello SS 115 kV Transmission Line Rebuild project. Further improvements are made through additional reconductor projects, the Saddle Mountains integration, and the addition of communication aided protection schemes.

Coeur d'Alene Area: Completion of the Coeur d'Alene – Pine Creek 115 kV Transmission Line Rebuild project and Cabinet – Bronx – Sand Creek 115 kV Transmission Line Rebuild project will provide significant transmission system performance in the near and long term planning horizon. The Sandpoint Reinforcement Project and installation of capacitor banks at St. Maries Substation is part of the long range plan for the area.

Lewiston/Clarkson Area: The transmission system in the Lewiston/Clarkson area exhibits relatively good performance. Issues are limited primarily to N-1-1 outages on the 230 kV system and voltage exceeding facility ratings during light loading conditions. Installation of shunt reactors is recommended to mitigate these issues.

Palouse Area: Completion of the Moscow 230 Station Rebuild project in 2014 has mitigated several performance issues. The remaining issue is an outage of both the Moscow and Shawnee 230/115 kV transformers. An operational and strategic long term plan is under development to best address the double transformer outage.

Spokane Area: Several performance issues exist with the present state of the transmission system in the Spokane area and worsen with additional load growth. The staged construction of new 230 kV facilities in particular the Garden Springs 230 kV and Ninth and Central 230 kV Substations to reinforce the area will be required. Dependency on Beacon Station presently leaves the system susceptible to performance issues for outages related to the station.

A list of corrective actions plans, developed to mitigate performance issues observed during the assessment, is provided in the following table. The plans are categorized as complete, planned (included in five year budget), needs further analysis (has been discussed but actionable plans are under development), conceptual (has been discussed and justification is pending) and new proposal (has not been presented in previous assessments).

	Year Issue Starts	Construction Start	Construction End	Priority	Cost Estimate
Big Bend	**2033**	**2017**	**2018**	**77.25**	**$82,125,000**
1-Completed					
Chelan - Stratford 115 kV Transmission Line River Crossing				0.01	
Stratford 115 kV Station Rebuild				0.01	
2-Planned					
Addy - Devils Gap 115 kV Transmission Line Reconductor	Present	2017	2018	4.16	$2,025,000
Benton - Othello SS 115 kV Transmission Line Rebuild	Present	2015	2016	77.25	$7,100,000
3-Needs Further Analysis					
Addy - Kettle Falls Protection Scheme	Present			45.00	$1,000,000
Chelan - Stratford 115 kV Transmission Line Rebuild	Present			2.48	$13,000,000
Lind – Warden 115 kV Transmission Line Rebuild	2033			0.14	$9,000,000
Saddle Mountain Integration	Present			23.18	$16,400,000
4-Conceptual					
Devils Gap - Stratford 115 kV Transmission Line Rebuild	2019			1.40	$30,100,000
Devils Gap Station Reconfiguration	Present			16.00	$3,000,000
Kettle Falls Capacitor Bank	2024			0.02	$500,000
Coeur d'Alene	**2034**	**2016**	**2018**	**90.30**	**$46,300,000**
1-Completed					
Lancaster Interconnection				0.01	
2-Planned					
Cabinet – Bronx – Sand Creek 115 kV Transmission Line Rebuild	Present	2015	2017	76.88	$7,500,000
Coeur d'Alene – Pine Creek 115 kV Transmission Line Rebuild	Present	2016	2018	90.30	$12,750,000
Pine Creek Transformer Replacement	2034			0.01	$500,000
3-Needs Further Analysis					
St. Maries Cap Bank	Present			3.13	$500,000
4-Conceptual					
Cabinet 230/115 kV Transformer Automatic LTC	2019			0.21	$50,000
Rathdrum 115 kV Bus Reconfiguration	2034			1.29	$5,000,000
Sandpoint Reinforcement	Present			16.31	$20,000,000
Lewiston/Clarkston	**2030**	**2017**	**2019**	**150.00**	**$15,325,000**
2-Planned					
Lolo Transformer Replacement	Present			0.13	$1,000,000
North Lewiston Reactors	Present	2015	2016	150.00	$4,900,000
4-Conceptual					
Hatwai - Lolo #2 230 KV Transmission Line	Present	2017	2019	7.97	$8,025,000
South Lewiston Station Rebuild	2030	2015	2016	0.06	$1,400,000
Palouse	**Present**			**107.25**	**$2,500,000**
1-Completed					
Moscow 230 Station Rebuild				0.01	
4-Conceptual					
Shawnee #2 230/115 kV Transformer	Present			107.25	$2,500,000
Spokane	**2034**	**2017**	**2019**	**157.50**	**$147,715,000**
2-Planned					
Garden Springs 115 kV Station Integration	Present	2017	2019	12.50	$8,200,000
Ninth & Central - Sunset 115 kV Transmission Line Rebuild	2023	2015	2016	0.05	$925,000
Spokane Valley Transmission Reinforcement	Present	2015	2016	157.50	$8,890,000
Westside Transformer Replacement	Present	2015	2016	1.38	$2,500,000
3-Needs Further Analysis					
Bell - Beacon Protection Scheme	Present			128.25	$0
Garden Springs 230 kV Station Integration	2032			0.14	$15,000,000
Nine Mile - Westside Protection Upgrade	Present			26.00	$200,000
4-Conceptual					
Beacon - Francis & Cedar 115 kV Transmission Line Reconductor	2032			0.01	$1,500,000
Beacon 230 kV Capacitor	Present			25.00	$1,500,000
Garden Springs - Ninth & Central 230 kV Transmission Line	2034			1.25	$30,000,000
Garden Springs - Thornton 230 kV Transmission Line	Present			5.63	$30,000,000
Ninth & Central 230 kV Integration	Present			56.25	$15,000,000
Rathdrum - Westside 230 kV Transmission Line	2034			0.09	$30,000,000
Silver Lake Switching Station	2032			0.01	$4,000,000

	Year Issue Starts	Construction Start	Construction End	Priority	Cost Estimate
System	**Present**			**600.00**	**$220,000**
3-Needs Further Analysis					
230 kV Capacitor Automatic Switching	Present			25.00	$20,000
RAS Update	Present			600.00	$200,000
Grand Total					**$294,185,000**

Additional projects not categorized as corrective action plans are listed in the following table:

	Construction Start	Construction End	Cost Estimate
Big Bend	**2019**	**2019**	**$18,747,700**
1-Completed			
Odessa Cap Bank			
2-Planned			
Devils Gap - Lind 115 kV Transmission Line Rebuild	2015	2016	$7,997,700
Ford Station Rebuild	2018	2019	$1,275,000
Gifford Station Rebuild	2015	2015	$1,200,000
Harrington Station Rebuild	2015	2016	$3,000,000
Little Falls Station Rebuild	2015	2017	$4,275,000
Valley Station Rebuild	2019	2019	$1,000,000
3-Needs Further Analysis			
49 Degrees Station			
Bruce Siding Station			
Lee and Reynolds Transformation			
Coeur d'Alene	**2019**	**2019**	**$44,625,000**
1-Completed			
Blue Creek Station Rebuild			
Julia Street			
Noxon Construction Station			
2-Planned			
Beck Road Station	2015	2014	
Benewah - Pine Creek 230 kV Transmission Line Rebuild	2018	2019	$15,000,000
Big Creek Station Rebuild	2016	2017	$1,300,000
Burke - Pine Creek #3 & #4 115 kV Transmission Line Rebuild	2015	2015	$3,500,000
Cabinet - Noxon 230 kV Transmission Line Rebuild	2017	2018	$1,500,000
Noxon Rapids 230 kV Switchyard Rebuild	2015	2019	$21,075,000
Priest River Station			
Sandpoint, Sagle, and Oden Grid Modernization			
St. Maries SCADA Upgrade/Add Feeder	2018	2018	$750,000
3-Needs Further Analysis			
Bronx Station	2019	2019	$1,500,000
Cabinet Gorge Switching Station			
Carlin Bay Station			
Noxon - Pine Creek #2 230 kV Transmission Line			
Lewiston/Clarkston	**2018**	**2019**	**$5,625,000**
1-Completed			
10th & Stewart Station Rebuild			
Lewiston Mill Road Station			
North Lewiston Distribution Station Relocation			
2-Planned			
Clearwater Station Upgrade	2015	2016	$1,000,000
Grangeville Station Rebuild	2018	2019	$2,025,000
Kamiah Wood Station Rebuild	2017	2018	$1,300,000
Kooskia Transformer Replacement			
Pound Land Station Rebuild	2017	2018	$1,300,000
3-Needs Further Analysis			
Wheatland Station			$0
Palouse	**2018**	**2019**	**$29,053,800**

	Construction Start	Construction End	Cost Estimate
2-Planned			
Benewah - Moscow 230 kV Transmission Line Rebuild	2015	2017	$24,178,800
Diamond Station Minor Rebuild			
Moscow City 115 SCADA/Minor Rebuild			
North Moscow Transformation	2018	2019	$1,800,000
Potlatch Transformer Replacement			
Tekoa SCADA Upgrade/Minor Rebuild			
3-Needs Further Analysis			
Deary - Potlatch 115 kV Transmission Line			
Tamarack Station	2018	2019	$3,075,000
Spokane	**2017**	**2019**	**$39,785,000**
2-Planned			
Chester Station Rebuild	2017	2018	$1,460,000
Deer Park Partial Rebuild	2015	2015	$750,000
Downtown West Station	2016	2018	$2,275,000
Greenacres/Otis Orchards Stations	2015	2015	$1,375,000
Hallett & White - Silver Lake 115 kV Transmission Line Rebuild	2017	2018	$2,025,000
Irvin Distribution	2016	2017	$1,875,000
Metro Station Rebuild	2016	2019	$13,150,000
Ninth & Central Station Upgrade	2015	2017	$2,950,000
Northwest Station Rebuild	2016	2017	$1,675,000
Ross Park Station Rebuild	2015	2017	$6,000,000
Southeast Capacity Increase	2016	2016	$450,000
Sunset Station Rebuild	2017	2019	$3,775,000
3-Needs Further Analysis			
Beacon - Bell - Francis & Cedar - Waikiki Reconfiguration	2016	2017	$2,025,000
Beacon Station Rebuild			
College and Walnut Consolidation/Rebuild			
Downtown East Station			
Hallett & White Capacitor Bank			
Hawthorne Station			
Hillyard Station			
Westside Station Rebuild			
System	**2015**	**2017**	**$9,794,000**
2-Planned			
Line Ratings Mitigation	2015	2017	$8,794,000
Spokane - Coeur d'Alene 115 kV Relay Upgrades	2015	2015	$1,000,000
Grand Total			**$147,630,500**

Executing the Corrective Action Plans will ensure the System is able to meet performance requirements as defined in the NERC Reliability Standards. A majority of the Corrective Action Plans are required to mitigate performance issues observed in the operating horizon (0-1 years).

II INTRODUCTION

Avista's 2015 Local Planning Report is the end product of both the Local Transmission Planning Process and the annual Planning Assessment. The Local Transmission Planning Process (Process) is outlined in Attachment K to Avista Corporation's (Avista) Open Access Transmission Tariff (OATT) FERC Electric Volume No. 8. The purpose of the Process is to identify Single System Projects needed to mitigate future reliability and load-service requirements for the Avista Transmission System. The Planning Assessment is outlined in the NERC Reliability Standard TPL-001-4. The purpose of the Planning Assessment is to determine where the System may have the inability to meet performance requirements as defined in the NERC Reliability Standards and to develop Corrective Action Plans addressing how the performance requirements will be met. The Planning Assessment of the Transmission System included performing steady state contingency analysis, analysis of potential voltage collapse, and transient technical studies. Development of the Local Planning Report supports compliance with applicable NERC Reliability Standards as well as satisfying necessary steps in the Local Transmission Planning Process.

The Local Planning Report, and associated collection of Corrective Action Plans and Single System Projects, provides a ten year Transmission System expansion plan by including all Transmission System Facility improvements.

1 REPORT ORGANIZATION

The Local Planning Report is organized by providing information about Avista's Transmission System in Section II.2 followed by a summary of the Local Planning Process in Section II.3. The Planning Assessment is covered in Section III beginning with an overview and project prioritization description. The remaining sections of the Local Planning Report are divided into the five geographical areas representing sections of Avista's Transmission System. The complete Planning Assessment includes all five area assessments. Sensitivity Analysis studies are presented in Section III.8.

2 COMPANY DESCRIPTION

2.1 Overview

Avista is a publicly held energy company primarily involved in the production, transmission and distribution of energy (natural gas and electricity). Avista, formerly known as The Washington Water Power Company, was founded on March 13, 1889, in Spokane, Washington, by ten enterprising men who saw the potential of one of the Northwest's most abundant natural resources — moving water.

Avista's primary market area covers more than 30,000 square miles, with energy generation, transmission, and distribution facilities in four Western states. The company serves more than 335,000 electric customers in eastern Washington and northern Idaho. Avista's electric power generation and transmission assets range in age from modern 21st century equipment to equipment that was patented and placed in service over 100 years ago.

The service territory served by the Avista electrical system is generally centered on the Spokane, Washington and Coeur d'Alene, Idaho load centers. Avista also serves a smaller southern load center located near Lewiston, Idaho and Clarkston, Washington. Figure II-1 geographically displays the Avista service territory.

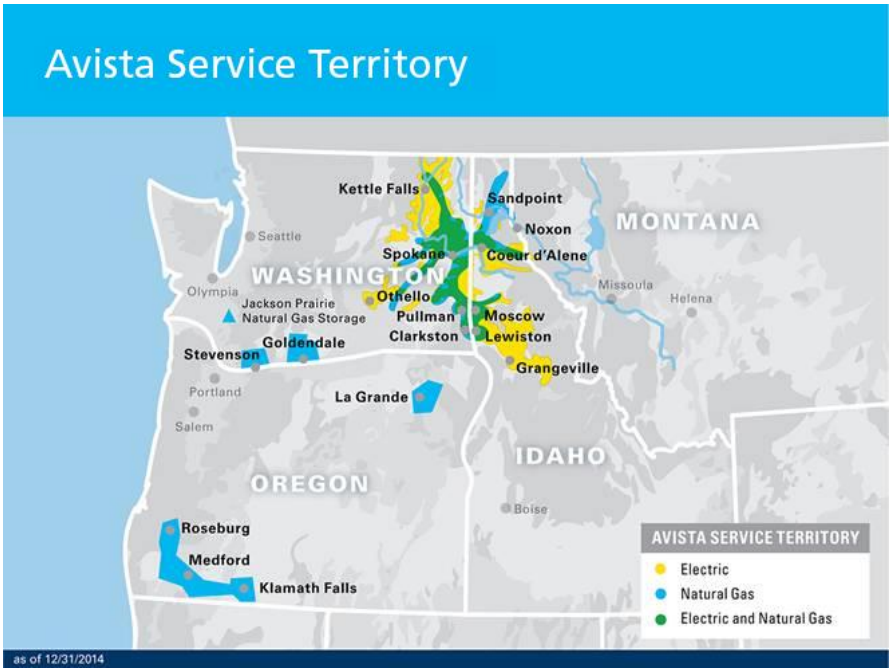


FIGURE II-1: AVISTA SERVICE TERRITORY

2.2 Transmission System

2.2.1 Transmission Lines

Avista owns and operates a system of over 2,200 miles of electric transmission facilities which include approximately 685 miles of 230 kV transmission lines and 1,527 miles of 115 kV transmission lines. Figure II-2 illustrates Avista's Transmission System on a map of the region.

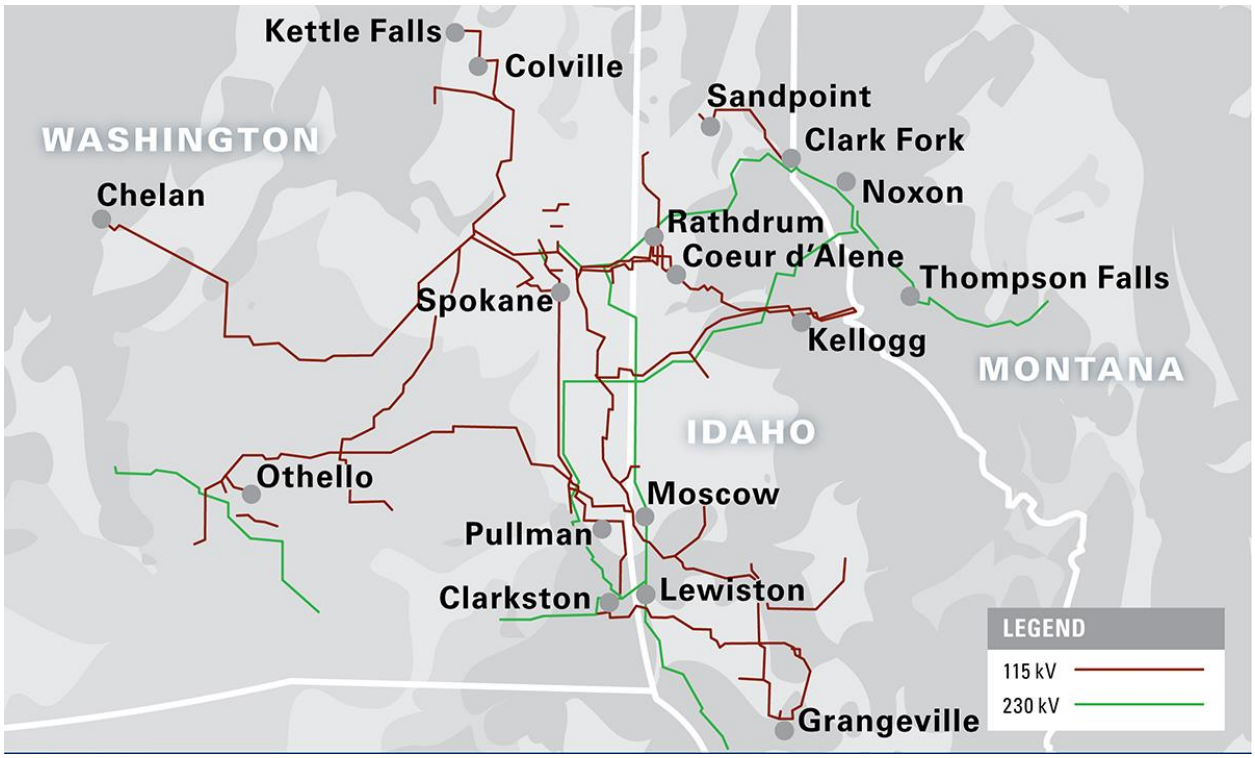


FIGURE II-2: AVISTA TRANSMISSION LINE MAP

The Avista 230 kV transmission lines are the backbone of Avista's Transmission. Figure II-3 shows a station level drawing of Avista's 230 kV Transmission System including interconnections to foreign utilities. Avista's 230kV Transmission System is interconnected to the BPA 500 kV transmission system at the Bell, Hot Springs and Hatwai Stations.

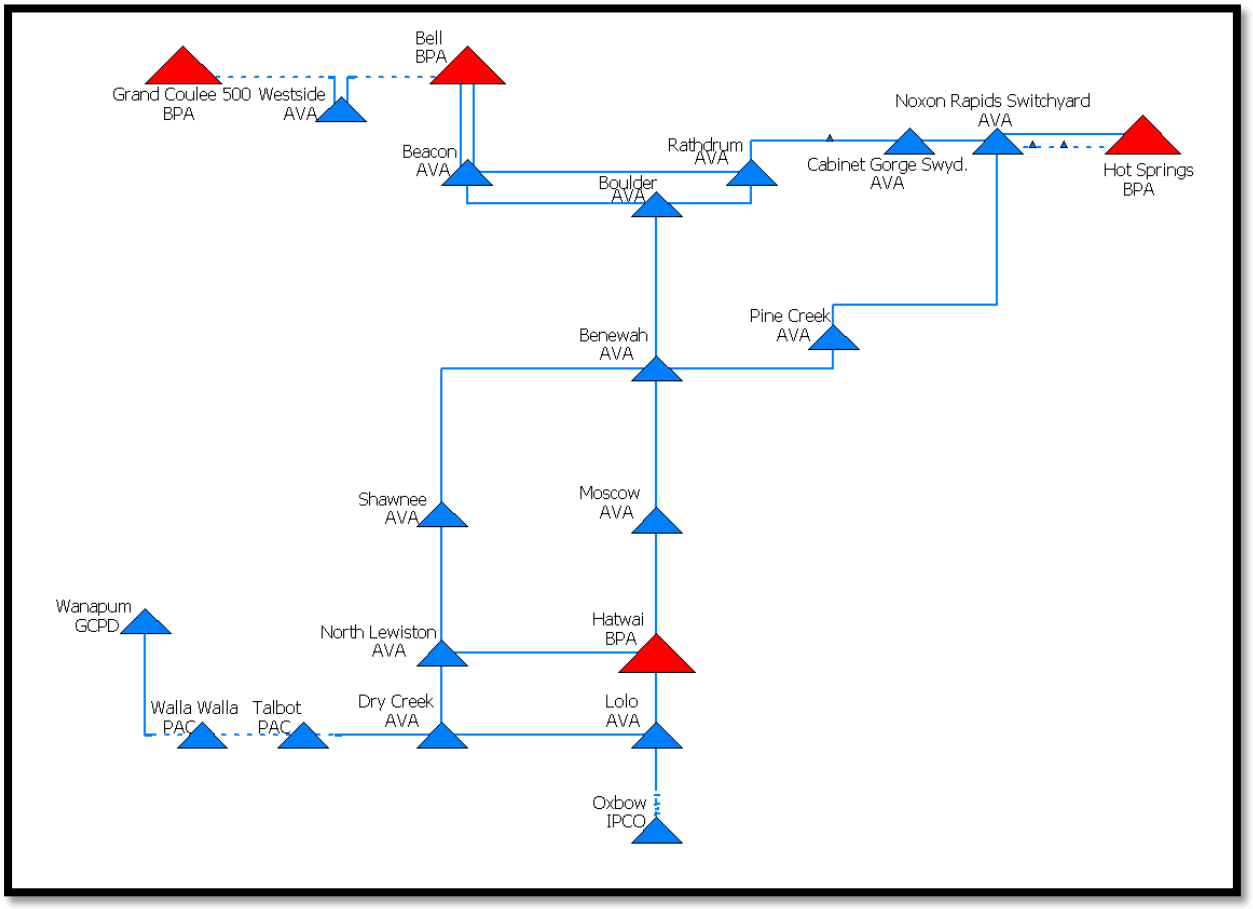


FIGURE II-3: AVISTA 230 KV TRANSMISSION SYSTEM

2.2.2 Transmission System Areas

Avista has separated its Transmission System into five geographical areas:

- Big Bend
- Coeur d'Alene
- Lewiston-Clarkston
- Palouse
- Spokane

The areas are shown with their approximate boundaries in Figure II-4. The Transmission System Assessment described in Section III is a compilation of assessments on each of the five areas.

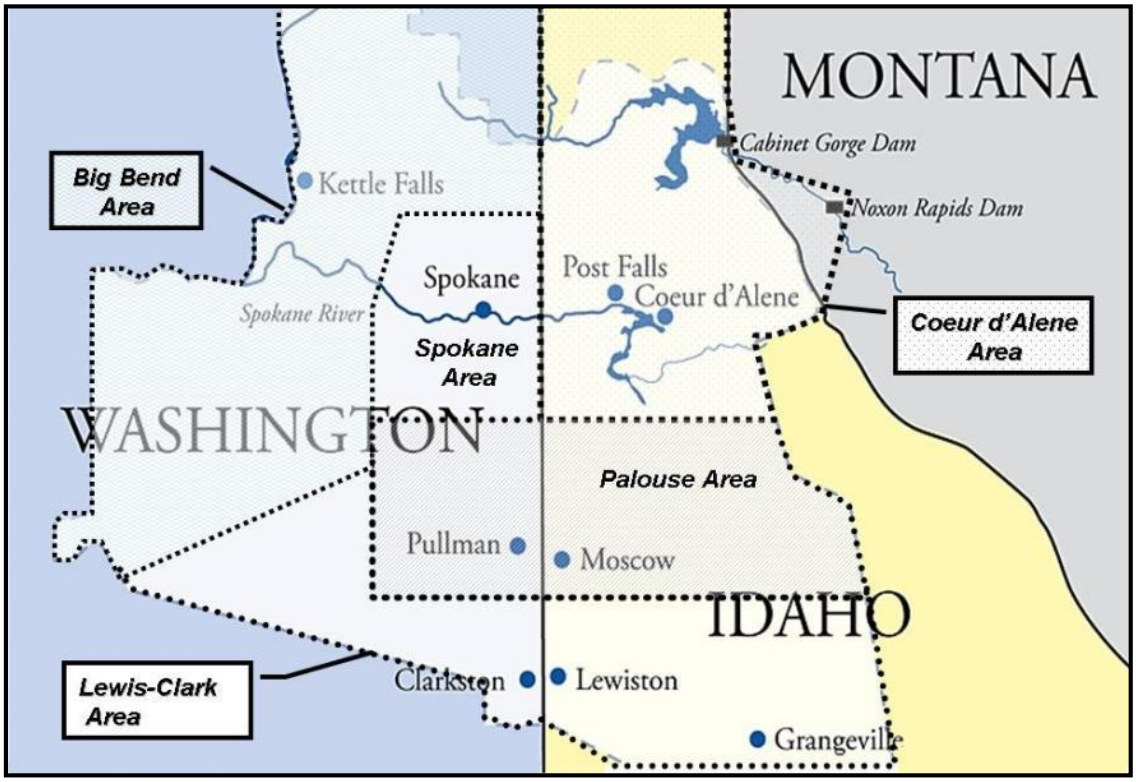


FIGURE II-4: AVISTA TRANSMISSION SYSTEM REGIONS

2.2.3 WECC Rated Paths

Avista owns transmission assets in the following WECC transfer paths:

- Path 6: West of Hatwai
- Path 8: Montana to Northwest
- Path 14: Idaho to Northwest

2.2.4 Points of Interconnection

Avista's Balancing Authority Area (BAA) is directly interconnected to the Balancing Authority Areas operated by:

- Bonneville Power Administration (BPA)
- Public Utility District No. 2 of Grant County (GCPD)
- Public Utility District No. 1 of Chelan County
- Idaho Power Company
- PacifiCorp

- NorthWestern Energy
- Seattle City Light

Significant points of interconnection are associated with the BPA 500/230 kV transformers located at the following BPA stations:

- G.H. Bell (Spokane, WA)
- Hatwai (Lewiston, ID)
- Hot Springs (Hot Springs, MT)

Within Avista's BAA, Avista's Transmission and Distribution System is interconnected with Pend Oreille PUD's Transmission System and several Load Serving Entities including: Asotin County PUD, Big Bend Electric Cooperative, City of Cheney, City of Chewelah, Clearwater Power Company, Fairchild Air Force Base, Idaho County Light & Power Cooperative, Inland Power & Light Company, Kootenai Electric Cooperative, Modern Electric Water Company, Northern Lights, and City of Plummer. Avista owned generation and distribution stations not connected directly to Avista's transmission system are typically telemetered into Avista's BAA.

2.3 Generation Resources

Avista has a diverse mix of generation with a majority of its generation being hydro power based on various projects located on the Spokane River and Clark Fork River. Avista owns eight hydroelectric generating plants as well as coal (partial ownership), natural gas, and wood-waste combustion plants in five eastern Washington, northern Idaho, eastern Oregon, and eastern Montana locations. Avista also utilizes power supply purchase and sale arrangements of varying lengths to meet a portion of its load requirements. Table II-1and Table II-2 summarize the operational capacities of Avista generating projects. Table II-1 includes the expected energy output of each facility based on the 70-year hydrologic record for the year ending 2014.

Project Name	Fuel	Location	Area	Project Start Date	Maximum Capability (MW)[1]	Expected Energy (aMW)
Monroe Street	Spokane River	Spokane, WA	Spokane	1890	15.0	**11.2**
Post Falls	Spokane River	Post Falls, ID	Coeur d'Alene	1906	18.0	**9.4**
Nine Mile	Spokane River	Nine Mile Falls, WA	Spokane	1925	32.0	**15.7**

[1] The maximum capability is the higher of the name plate capacity or the maximum capability—these numbers may vary from the 2015 Electric IRP numbers.

Project Name	Fuel	Location	Area	Project Start Date	Maximum Capability (MW)[1]	Expected Energy (aMW)
Little Falls	Spokane River	Ford, WA	Big Bend	1910	35.2	**22.6**
Long Lake	Spokane River	Ford, WA	Big Bend	1915	89.0	**56.0**
Upper Falls	Spokane River	Spokane, WA	Spokane	1922	10.2	**7.3**
Cabinet Gorge	Clark Fork	Clark Fork, ID	Coeur d'Alene	1952	270.5	**123.6**
Noxon Rapids	Clark Fork	Noxon, MT	Coeur d'Alene	1959	610.0	**196.5**
Total	All Hydro				1065.4	442.3

TABLE II-1: AVISTA HYDROELECTRIC GENERATION RESOURCES

Project Name	Fuel	Location	Area	Project Start Date	Maximum Capability (MW)[2]
Colstrip 3&4 (15%)	Coal	Colstrip, MT	N/A	1984	**247.0**
Rathdrum (CT)	Gas	Rathdrum, ID	Coeur d'Alene	1995	**178.0**
Northeast (CT)	Gas/Oil	Spokane, WA	Spokane	1978	**68.0**
Boulder Park (IC)	Gas	Spokane, WA	Spokane	2002	**24.6**
Coyote Springs 2 (CC)	Gas	Boardman, OR	N/A	2003	**312.0**
Kettle Falls	Wood	Kettle Falls, WA	Big Bend	1983	**50.7**
Kettle Falls (CT)	Gas	Kettle Falls, WA	Big Bend	2002	**11.0**
Total	All Thermal				891.3

TABLE II-2: AVISTA THERMAL GENERATION RESOURCES

For more information on Avista's generation, please refer to the Integrated Resource Plan.

[2] The maximum capability figures associated with thermal power plants is the highest of either the summer, winter, or nameplate capacities. These numbers may conflict with the project description numbers.

2.4 Distribution System

Avista's distribution system consists of over 18,300 miles of distribution lines operated at voltages ranging from 4 kV to 35 kV. The majority of the distribution system is configured as radial feeders with ties to adjacent feeders and substations for redundancy. The distribution system serving the downtown Spokane area is an exception as it operates in a networked configuration.

2.5 Customer Demand

Avista biennially develops an Electric Integrated Resource Plan (IRP) which is a thoroughly researched and data-driven document to guide responsible resource planning for the company. Included in the IRP is a detailed process for native load forecasting. For more information on Avista's load and load forecasting methodology, please refer to the IRP.

2.5.1 Native Load

Avista's typical peak hour is in the winter months, between November and early February. Air conditioning loads have created some summer months where peak loads exceeded those of winter. This phenomenon has transformed Avista into a dual peaking utility. Even though summer peaks may be higher than winter, Avista still expects to have its highest electricity load in the winter. Avista's all-time native peak load was in the winter of 2009 at 1,821 MW.

As documented in the IRP, Avista's 20-year native peak load growth rate was 0.74 percent in the winter and 0.85 percent in the summer, excluding large industrial customers. Figure II-5 illustrates the growth levels compared to historical peaks for both summer and winter.

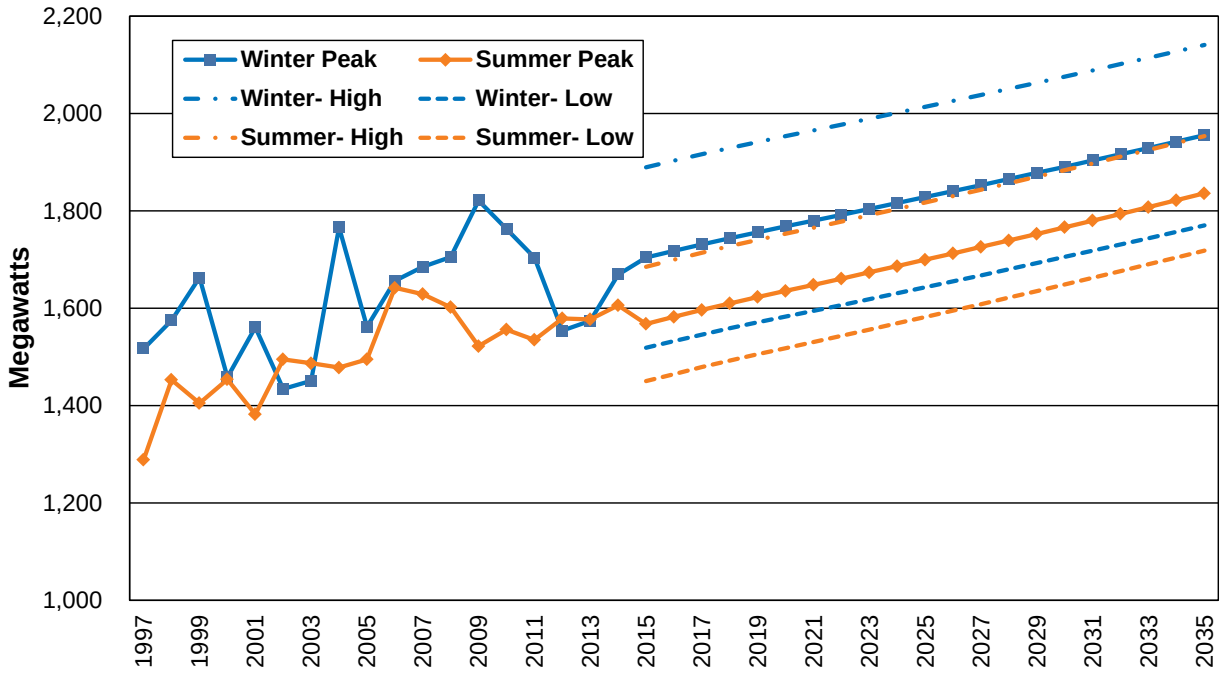


FIGURE II-5: WINTER AND SUMMER NATIVE LOAD PEAK DEMAND, 1997-2035

2.5.2 Balancing Authority Area (BAA) Load

Avista's BAA load peaks around 2,200 MW in the winter and 2,050 MW in the summer. Figure II-6 shows the BAA load historical monthly peaks from 2001-2014 and the forecasted monthly peaks for 2015-2030. The power factor of typical loads at a station vary from 0.95 in the summer to unity in the winter. During light load conditions, some loads may have leading power factor. Variation in power factor affects how the Transmission System needs to be operated. Under low power factor scenarios, additional reactive resources are required to maintain applicable facility voltage ratings.

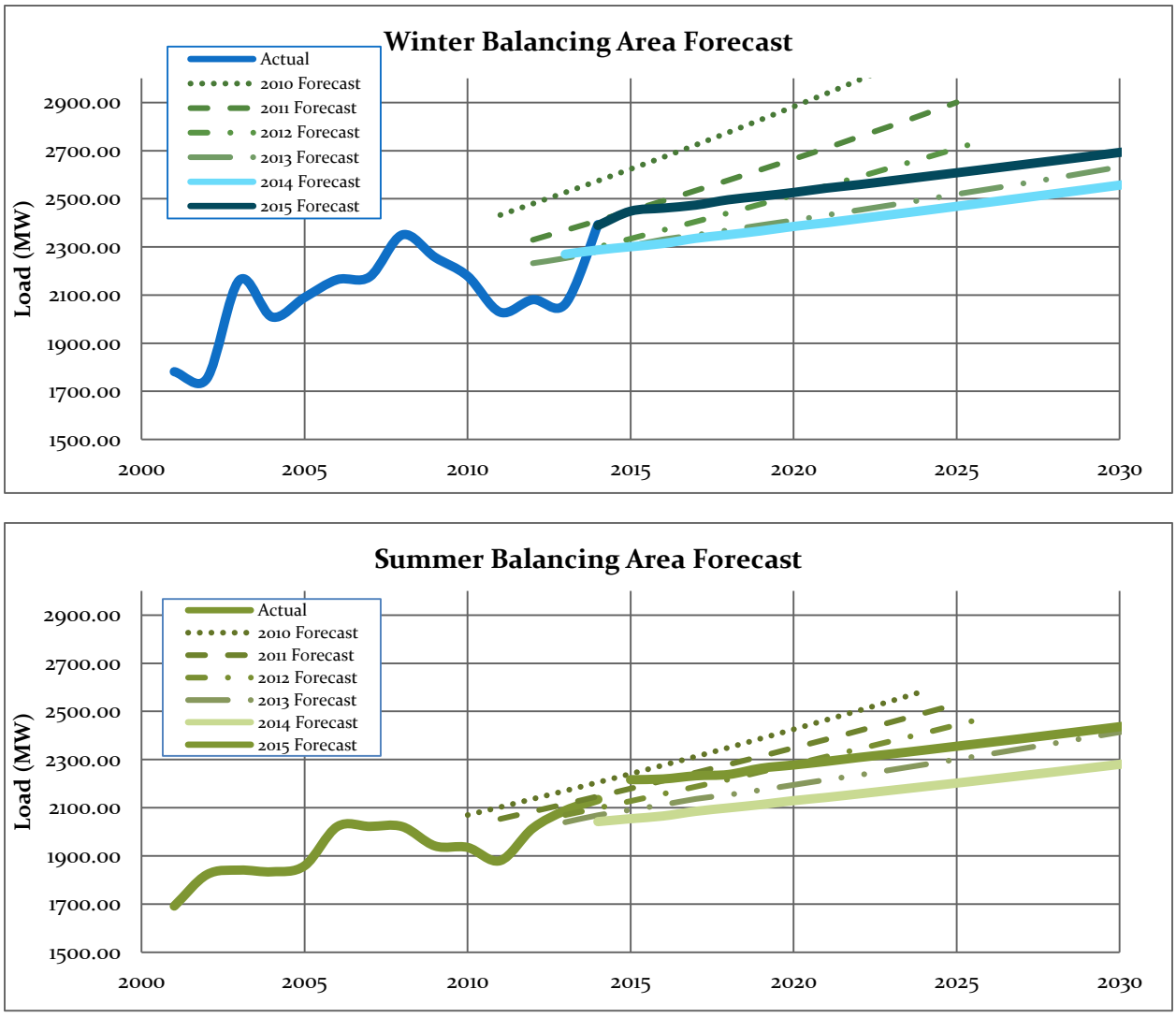


FIGURE II-6: ACTUAL AND FORECASTED PEAK BALANCING AUTHORITY AREA LOAD

The BAA load growth rate is expected to be similar to the native load growth rate. The forecast data for the loads which are not Avista's native loads are provided by the Bonneville Power Administration on behalf of the Load Serving Entity of each load.

3 LOCAL PLANNING PROCESS

The development of the Local Planning Report follows the Local Transmission Planning Process provided in Attachment K, Part III – The Avista Local Transmission Planning Process of Avista's OATT. The Local Planning Report has been prepared within the two-year process as defined in Avista's OATT Attachment K. The Local Planning Report identifies the Transmission System facility additions required to reliably interconnect forecasted generation resources and serve the forecasted Network Customers' load, Native Load Customers' load, and Point-to-Point Transmission Customers' requirements, including both grandfathered, non-OATT agreements and rollover rights, over a ten (10) year planning horizon. Additionally, the Local Planning Report incorporates the results of any stakeholder-requested economic congestion studies results that were performed. For the 2015-2016 planning cycle, no economic congestion studies were requested or incorporated. The Process is open to all Interested Stakeholders, including, but not limited to, all Transmission Customers, interconnection customers, and state authorities.

Avista coordinates its planning processes with other transmission providers through membership in the ColumbiaGrid, Northern Tier Transmission Group (NTTG) and the Western Electricity Coordinating Council (WECC). Avista uses the ColumbiaGrid process for its Regional Planning Process[3]. The results from both years of the biennial planning process are provided to ColumbiaGrid for incorporation into their planning process. Avista uses the WECC for its interconnection wide planning and development of wide-area planning proposals.

Avista's OATT is located on its Open Access Same-time Information System (OASIS) at http://www.oatioasis.com/avat. Additional information regarding Avista's Transmission Planning is located in the Transmission Planning folder on Avista's OASIS.

3.1 Study Development Meeting

Avista held a Study Development Meeting during the second quarter of 2015 providing participants an opportunity to provide comments for data gathering, initial assumptions and input into the study development. All comments received at the Study Development Meeting, or during the 30 days following, were incorporated into the Local Planning Report.

The purpose of the Process is to identify Single System Projects needed to mitigate future reliability and load-service requirements for the Avista Transmission System.

3.2 Local Planning Report Development

Avista uses the data gathered from the Study Development Meeting to perform a Planning Assessment. The results of the Planning Assessment are documented in the Local Planning Report. The Local Planning Report may also include additional information regarding projects and System modifications developed through others means then the Planning Assessment.

[3] As described in FERC Order 890 and its subsequent Orders, and Order 1000

3.2.1 Access to Planning Data

The Transmission System models used in the Planning Assessment can be provided within 10 calendar days, via email or other media, to any WECC member that makes a request. Non-WECC members will be required to sign a confidentiality agreement with the WECC before any base cases can be shared. Once the WECC confirms a confidentiality agreement has been signed, the requested base case(s) shall be provided within 10 calendar days. Any additional information needed to replicate the technical study results of the Planning Assessment can be provided, upon written request.

3.2.2 Identification of Analytical Tools

The following Analytical Tools were used to perform technical studies in the Planning Assessment:

- PowerWorld Simulator Software, Version 18
  - PowerWorld Simulator is an interactive power systems simulation package designed to simulate high voltage power systems operation on a time frame ranging from several minutes to several days. The software contains a highly effective power flow analysis package capable of efficiently solving systems with up to 100,000 buses using mathematical calculations based on system impedances, load levels and generation output. PowerWorld provides the user with a variety of sophisticated study tools such as an automated contingency processor, an Available Transfer Capability (ATC) tool, an Optimal Power Flow tools, various voltage stability tools (i.e. PV and QV tools), and a Transient Stability Analysis tool.

3.3 Draft Local Planning Report Meeting

Avista held a Draft Study Report meeting in the fall of 2015 to discuss the Draft Local Planning Report. After the comment period following that meeting, Avista confirmed and finalized the 2015 Local Planning Report.

3.4 Point of Contact

A Point of Contact for questions regarding the Local Planning Report and the projects described within it has been designated. Please contact the party named below for any questions:

Transmission Planning Department
PO Box 3727, MSC-16
Spokane, WA 99220
TransmissionPlanning@avistacorp.com

III PLANNING ASSESSMENT

1 ASSESSMENT OVERVIEWS

Transmission System assessment was conducted using the same analysis techniques for each area. The assessments consisted of steady state analysis and stability analysis.

1.1 Transmission System Models (TPL-001-4, R1)

Avista's System Planning Department develops a set of transmission system models (Planning Cases) biannually to model its Transmission Planner and Planning Coordinator areas as well as the regional Transmission System. The Planning Case development process outlined in the internal document *TP-SPP-04 – Data Preparation for Steady State and Dynamic Studies* outlines the use of WECC approved base cases and applying steady state and dynamic data modifications as required representing desired scenarios. The resulting Planning Cases represent a normal System condition (N-0). Planning Cases include the following:

- All existing facilities i.e. no planned transmission expansion project models. In past studies, inclusion of non-committed planned transmission models has incorrectly hidden potential reliability and load-service issues. Subsequently, a Corrective Action Plan was not developed as necessary (TPL-001-4, R1.1.1)
- Known outages of generation or Transmission Facilities with a duration of at least six months. Presently, Avista does not have planned outages outside the operations planning horizon. Long duration outages outside of Avista's Transmission Planner or Planning Coordinator areas are typically modeled in WECC approved base cases. (TPL-001-4, R1.1.2, R2.1.3)
- New planned Facilities and changes to existing Facilities. The Transmission System models are updated bi-annually to incorporate constructed projects and changes to existing Facilities. Planning Cases are developed to represent scenarios with and without planned Facilities and changes to existing Facilities; refer to table in Appendix A. (TPL-001-4, R1.1.3)
- Real and reactive Load forecasts. Load forecasts are developed annually and incorporated into the Planning Cases. (TPL-001-4, R1.1.4)
- Known commitments for Firm Transmission Service and Interchange. Developing sensitivity cases with WECC Rated Paths at their limits represents scenarios with all existing known commitments modeled. Future commitments exceeding the limits of WECC Rated Paths are not presently studied. (TPL-001-4, R1.1.5)
- Resources (supply or demand side) required for Load. Resource dispatch forecasts are developed based on historical data and represented accordingly in the Planning Cases. (TPL-001-4, R1.1.6)

- Normal operating procedures. All established pre-contingency operating procedures are represented. Manual application of each operating procedure is followed in the process of developing each Planning Case.
- Reactive Power Resources. All existing Reactive Power Resources are modeled to ensure adequate reactive resources are available.

1.2 Steady State Analysis (TPL-001-4, R2.1-2.2 & R3)

For the Steady State portion of the Planning Assessment, Avista performs contingency analysis based on computer simulation models according to the following section.

1.2.1 Analysis Development

The following Transmission System models are developed to represent various seasonal conditions:

- Heavy Summer and Heavy Winter:
  - Year two (next year, i.e. 2016 case if case is created and used in 2015) (TPL-001-4, R2.1.1, R2.4.1)
  - Year five (TPL-001-4, R2.1.1, R2.4.1)
  - Year ten (TPL-001-4, R2.2.1, R2.5)
- Light Summer and Light Winter
  - Year two (next year, i.e. 2016 case if case is created and used in 2015) (TPL-001-4, R2.1.2, R2.4.2)
  - Year five (TPL-001-4, R2.1.2, R2.4.2)
- Heavy Summer with Low Local Hydro Generation (generation dispatch scenario sensitivity):
  - Year two (next year, i.e. 2016 case if case is created and used in 2015) (TPL-001-4, R2.1.1, R2.4.1)
  - Year five (TPL-001-4, R2.1.4, R2.4.3 for R2.1.1 and R2.4.1)
  - Year ten (TPL-001-4, R2.1.4 for R2.1.1)
- Transfer Scenarios
  - West of Hatwai – East to West (TPL-001-4, R2.1.4, R2.4.3 for R2.1.2 and R2.4.2)
  - Montana to Northwest – East to West (TPL-001-4, R2.1.4, R2.4.3 for R2.1.2 and R2.4.2)
  - Montana to Northwest – West to East (TPL-001-4, R2.1.4, R2.4.3 for R2.1.1 and R2.4.1)
  - Idaho to Northwest – East to West (TPL-001-4, R2.1.4, R2.4.3 for R2.1.2 and R2.4.2)
  - Idaho to Northwest – West to East (TPL-001-4, R2.1.4, R2.4.3 for R2.1.1 and R2.4.1)

A detailed summary of specific flows and loading levels for the Planning Cases used in the 2015 Planning Assessments is provided in Appendix A - Planning Case Summary.

Figure III-1 and Figure III-2 provide a comparison of the Summer and Winter model to historical Balancing Authority Area load and Balancing Authority Area interchange excluding dynamic imports.

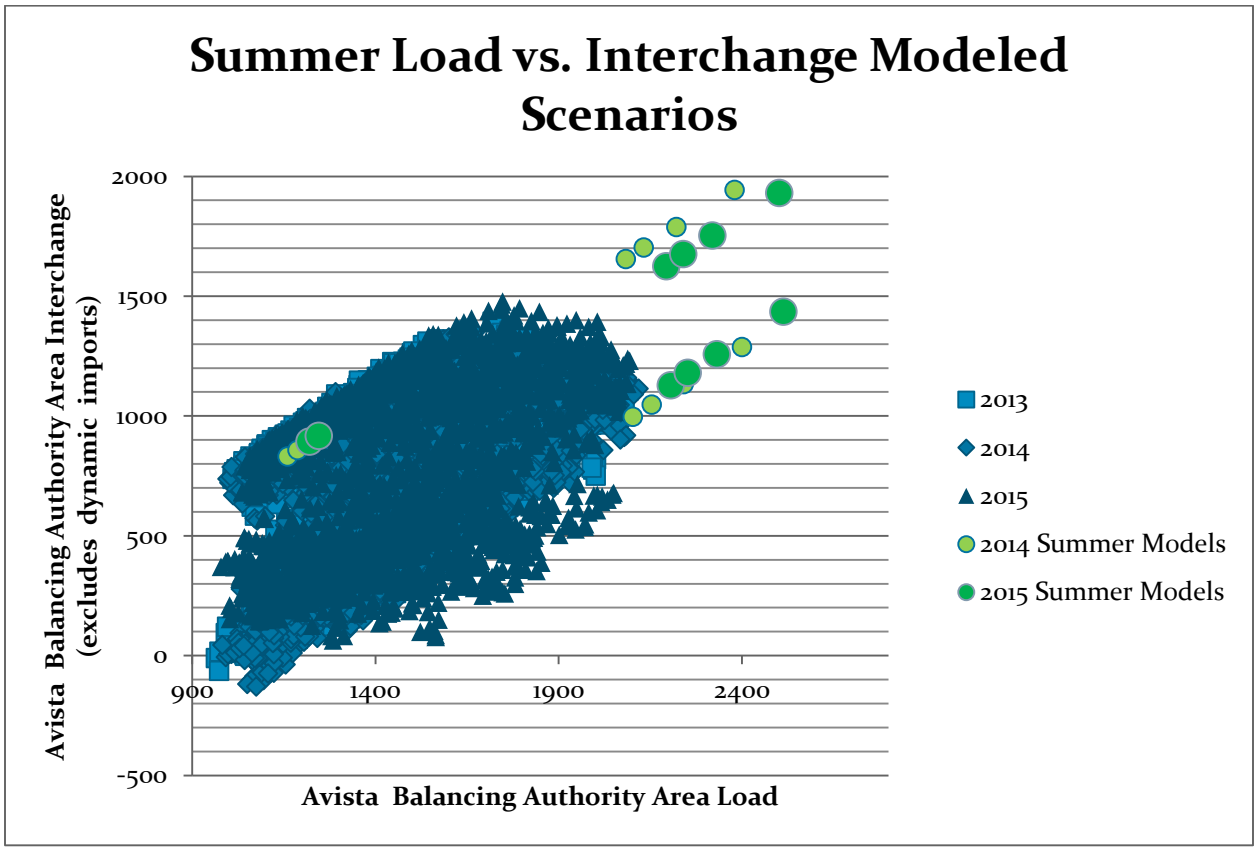


FIGURE III-1: SUMMER MODEL SCENARIOS

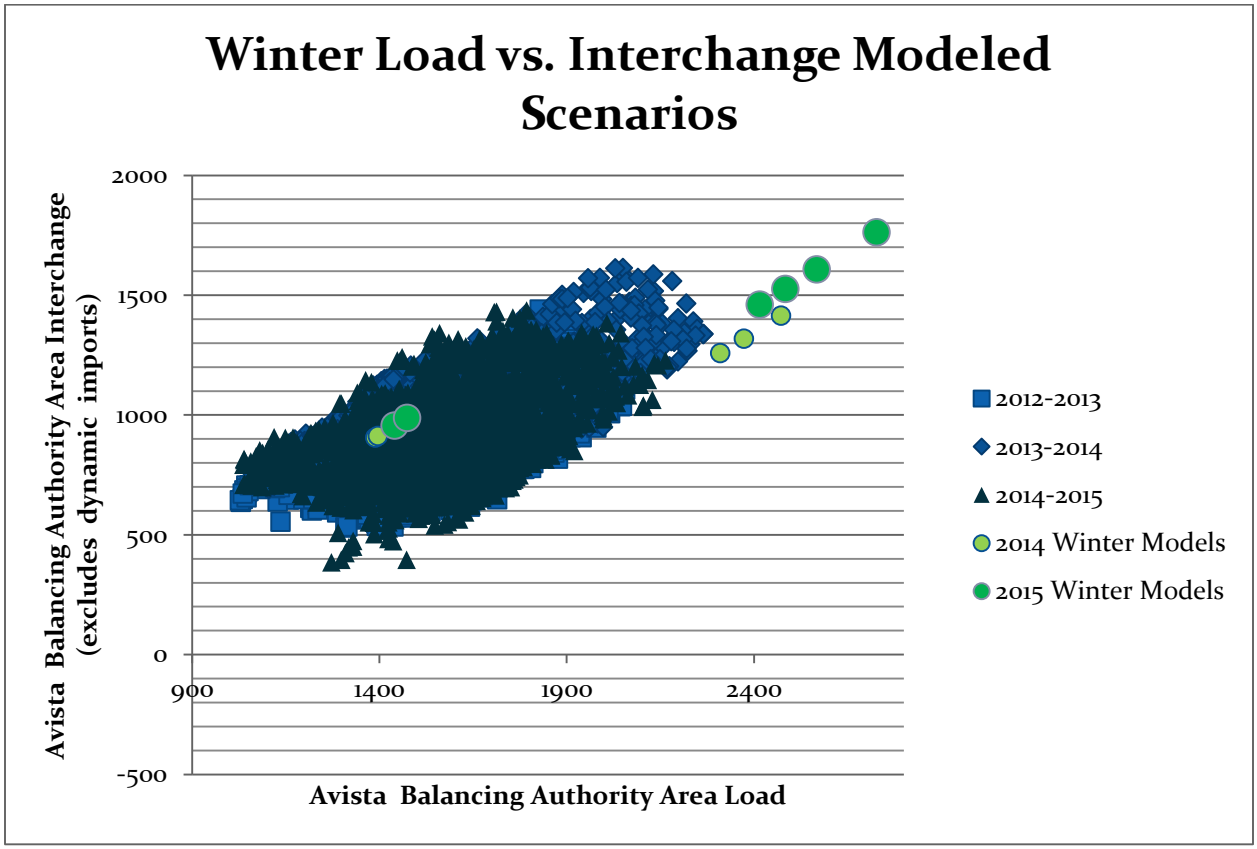


FIGURE III-2: WINTER MODEL SCENARIOS

Load Forecast

Load forecasts for Network Customers and Point-to-Point Customers were requested at the Study Development Meeting. The BPA submitted its forecast load information as a Network Customer to Avista for inclusion in the technical studies. Avista's System Planning Department incorporated forecast load data for the Avista LSE into the technical studies.

Planned Generation Facilities

Only potential generation projects in the Avista Interconnection Request queue that have executed Interconnection Agreements are modeled (with corresponding upgrades) in the base cases for technical studies.

The 2015 Planning Assessments did not include any potential generation in the technical studies.

1.2.2 Spare Equipment Analysis (TPL-001-4, R2.1.5)

Avista's spare 230/115 kV transformer spare equipment strategy is to purchase a new transformer upon failure resulting in potential lead times exceeding one year or more. Therefore, a study assessing the impact of the unavailability of transformers is conducted for each area. The study methodology involves each transformer in an area being taken out of

service and all single transmission line or transformer, bus outage, and breaker failure contingencies assessed (P0, P1, and P2). Only the Heavy Summer scenario in the five year planning horizon is studied.

1.2.3 Voltage Stability Analysis

Steady state analysis techniques are used to evaluate the voltage stability performance of the transmission system. PV analysis of a particular area or of a particular transfer path reveals the static stability margin of the area or of the path under study.

A PV curve is obtained in steady state simulation by monitoring a voltage at a bus of interest and varying (increasing) the power (load or transfer) in small increments until power-flow divergence is encountered. Each equilibrium point represents a steady-state operating condition. For each area, all loads within the area were increased until voltage collapse occurred. An assumption was made that all additional generation necessary to supply the increase in load came from a distribution of all generation in WECC. Each area consisted of a Load Ramp PV Curve analysis with the five year heavy summer scenario. Transfer Path PV Curve analysis is conducted on the sensitivity scenario representing WECC paths operating at their limits.

A set of contingencies depicting one or more transmission outages was used to produce a series of PV curves for both the Load Ramp and Transfer Path PV Curve analysis. The operating limit can be established as the lowest of the following as obtained from the PV analysis results:

1. 5% below the area load magnitude at the ‘nose-point’ for Category P0 performance,
2. 5% below the area load magnitude corresponding to the ‘nose-point’ on the PV curve representing the worst Category P1 contingency,
3. 2.5% below the area load magnitude corresponding to the ‘nose-point’ on the PV curve representing the worst Category P2-P7 contingency.

1.2.4 Steady State Performance Criteria

The criteria used in evaluating the performance of the Transmission System are the present North American Electric Reliability Corporation (NERC) Reliability Standards and WECC regional criterion including the following:

- TPL-001-WECC-CRT-2.1 – System Performance
- TPL-001-4 – Transmission System Planning Performance Requirements
- FAC-010 – System Operating Limit Methodology for the Planning Horizon

The contingencies evaluated for steady state studies are a standard contingency set used by Avista’s System Planning Department, reviewed and updated annually. Documentation on the contingency set is provided by Transmission Planning Standards, Policies and Procedures TP-SPP-06 Contingency Analysis. The standard contingency set includes outages in Avista’s

Transmission System as well as outages in adjacent Planning Coordinator and Transmission Planner areas. TP-SPP-06 Contingency Analysis provides detailed explanation of the contingencies evaluated. The steady state studies are performed to determine whether the BES meets the performance requirements listed below: (TPL-001-4, R3.1, R3.4)

Category P0: For normal operating conditions, no facilities shall exceed their applicable facility ratings or exceed the desired voltage range.

Category P1: For single contingency scenarios, no facilities shall exceed their applicable facility ratings nor shall they exceed the desired voltage.

Category P2: For single contingency scenarios, including but not limited to line end open and relocation of normally open points, opening of a line section without a fault, bus section fault, and internal breaker fault (non bus tie and bus tie breaker), no facilities shall exceed their applicable facility ratings nor shall they exceed the desired voltage range.

Category P3: (Multiple Contingency) For a loss of a generator unit with system adjustments and then the loss of any other single contingency scenario, no facilities shall exceed their applicable facility ratings nor shall they exceed the desired voltage.

Category P4: (Multiple Contingency) For the loss of multiple elements caused by fault plus stuck breaker, no facilities shall exceed their applicable facility ratings nor shall they exceed the desired voltage.

Category P5: (Multiple Contingency) For a delayed fault clearing scenario due to protection system failure for any single node outage, no facilities shall exceed their applicable facility ratings nor shall they exceed the desired voltage.

Category P6: (Multiple Contingency) For a single contingency followed by system adjustment and then overlapped with another single contingency, no facilities shall exceed their applicable facility ratings nor shall they exceed the desired voltage.

Category P7: (Multiple Contingency) For the loss of any two adjacent circuits on common structures, no facilities shall exceed their applicable facility ratings nor shall they exceed the desired voltage.

Extreme Events: For extreme contingencies system performance is analyzed on a case-by-case basis for performance and potential mitigation.

The steady state studies simulate the removal of all elements that the Protection System and other automatic controls are expected to disconnect for each Contingency without operator intervention. Transformer LTC's and phase shifters within Avista's System and those within neighboring System's are controlled by manual operator intervention. Shunt capacitors and reactors are allowed to switch in the studies at their automatic relay control points. (TPL-001-4, R3.3.1, R3.3.2)

Studies conducted for the 2015 System Assessment did not evaluate the tripping of generators where simulations show generator bus voltages or high side of the generation step up (GSU) voltages are less than known or assumed minimum generator steady state or ride through voltage limitations. Further studies or will be included in next years assessment or future years studies (TPL-001-4, R3.3.1.1)

Studies conducted for the 2015 System Assessment did not evaluate the tripping of Transmission elements where relay loadability limits were exceeded. Further studies or will be included in next years assessment or future years studies (TPL-001-4, R3.3.1.2)

1.3 Stability Analysis (TPL-001-4, R2.4, R4)

For the Stability portion of the Planning Assessment, Avista performs contingency analysis based on computer simulation models according to the following section.

1.3.1 Analysis Development

The same Transmission System models described in Section 1.2.1 are used for Stability Analysis. The loads represented include models which represent the expected dynamic behavior of loads that could impact the study area, considering the behavior of induction motor loads. WECC approved base cases have historically used an 80% induction motor load model. During 2014, WECC began to use the composite load model which more accurate captures the characteristics of the loads. (TPL-001-4, R2.4.1)

1.3.2 Stability Performance Criteria

The criteria used in evaluating the performance of the Transmission System are the present North American Electric Reliability Corporation (NERC) Reliability Standards and WECC regional criterion including the following:

- TPL-001-WECC-CRT-2.1 – System Performance
- TPL-001-4 – Transmission System Planning Performance Requirements
- FAC-010 – System Operating Limit Methodology for the Planning Horizon

The contingencies evaluated for stability studies are a standard contingency set used by Avista's System Planning Department, reviewed and updated annually. Documentation on the contingency set is provided by Transmission Planning Standards, Policies and Procedures TP-SPP-06 Contingency Analysis. The standard contingency set includes outages in Avista's Transmission System as well as outages in adjacent Planning Coordinator and Transmission Planner areas. TP-SPP-06 Contingency Analysis provides detailed explanation of the contingencies evaluated. The stability studies are performed to determine whether the BES meets the performance requirements listed below: (TPL-001-4, R4.1, R4.4)

- Category P0: Applicable to steady state only.
- Category P1:
  - During single contingency scenarios, no generating unit shall pull out of synchronism. A generator being disconnected from the System by fault clearing action or by a Special Protection System is not considered pulling out of synchronism.
  - Power oscillations shall exhibit acceptable damping as established by Avista. The 2015 System Assessment did not include systematic monitoring of oscillations damping.
  - Voltage and frequency deviations for Category B in Table III-1.
- Category P2-P7:
  - When a generator pulls out of synchronism in the simulations, the resulting apparent impedance swings shall not result in the tripping of any Transmission system elements other than the generating unit and its directly connected Facilities.
  - Power oscillations shall exhibit acceptable damping as established by Avista. The 2015 System Assessment did not include systematic monitoring of oscillations damping.
  - Voltage and frequency deviations for Category C in Table III-1.
- Extreme Events: During extreme contingencies, system performance is analyzed on a case-by-case basis for performance and potential mitigation. (TPL-001-4, R4.2)

NERC and WECC Categories	Outage Frequency Associated with the Performance Category (outage/year)	Transient Voltage Dip Standard	Minimum Transient Frequency Standard	Post Transient Voltage Deviation Standard (See Note 3)
A	Not Applicable	Nothing in addition to NERC.		
B	≥ 0.33	Not to exceed **25%** at load buses or **30%** at non-load buses. Not to exceed **20% for more than 20 cycles** at load buses.	Not below **59.6** Hz for 6 cycles or more at a load bus.	Not to exceed **5%** at any bus.
C	0.033 – 0.33	Not to exceed **30%** at any bus. Not to exceed **20% for more than 40 cycles** at load buses.	Not below **59.0** Hz for 6 cycles or more at a load bus.	Not to exceed **10%** at any bus.
D	< 0.033	Nothing in addition to NERC.		

TABLE III-1: WECC DISTURBANCE-PERFORMANCE TABLE FROM TPL-001-WECC-CRT-2.1

The stability studies simulate the removal of all elements that the Protection System and other automatic controls are expected to disconnect for each Contingency without operator intervention. Generator exciter control and power system stabilizers, static var compensators, power flow controllers and DC Transmission controllers are included in the simulations. (TPL-001-4, R4.3.1, R4.3.2)

Studies conducted for the 2015 System Assessment did not evaluate successful or unsuccessful high speed reclosing. Avista's typical reclosing practice is to reclose at one second. (TPL-001-4, R4.3.1.1)

Studies conducted for the 2015 System Assessment did not evaluate the tripping of generators where simulations show generator bus voltages or high side of the generation step up (GSU) voltages are less than known or assumed minimum generator steady state or ride through voltage limitations. (TPL-001-4, R4.3.1.2)

Studies conducted for the 2015 System Assessment did not evaluate the tripping of Transmission lines and transformers where transient swings cause Protection System operation based on generic or actual relay models. (TPL-001-4, R4.3.1.3)

1.4 Corrective Action Plans (R2.7)

When the studies conducted indicate an inability of the System to meet the performance requirements, a Corrective Action Plan(s) addressing how the performance requirements will be met is developed. Revisions to the Corrective Action Plan(s) are allowed in subsequent Planning Assessments but the planned System shall continue to meet the performance requirements. Corrective Action Plan(s) do not need to be developed solely to meet the performance requirements for a single sensitivity case analyzed.

Corrective Action Plan(s) will list System deficiencies and the associated actions needed to achieve required System performance. Actions may include (TPL-001-4, R2.7.1):

- Installation, modification, retirement, or removal of Transmission and generation Facilities and any associated equipment
- Installation, modification, or removal of Protection Systems or Special Protection Systems
- Installation or modification or automatic generation tripping as a response to a single or multiple Contingency to mitigate Stability performance violations
- Installation or modification of manual and automatic generation

Corrective Action Plans will be developed to resolve performance deficiencies identified in multiple sensitivity studies or rationale will be provided for why actions are not necessary. (TPL-001-4, R2.7.2)

If situations arise that are beyond the control of Avista that prevent the implementation of a Corrective Action Plan in the required timeframe, then Avista is permitted to utilize Non-Consequential Load Loss and curtailment of Firm Transmission Service to correct the situation that would normally not be permitted, provided Avista documents that they are taking actions to resolve the situation. Avista shall document the situation causing the problem, alternatives evaluated, and the use of Non-Consequential Load Loss or curtailment of Firm Transmission Service. (TPL-001-4, R2.7.3)

Each Corrective Action Plan will be reviewed in subsequent annual Planning Assessments for continued validity and implementation status of identified System Facilities and Operating Procedures. (TPL-001-4, R2.7.4)

2 PERFORMANCE ISSUE PRIORITIZATION

Prioritization of System performance issues identified in the planning assessment is developed based on the consequences and risk of the event and associated problem. The consequence of an issue is determined through consideration of criteria violations (stability, thermal, and voltage) and the amount of load and generation affected. The probability of the issue considers the likelihood of the event to occur and the timeframe from the present assessment year the issue exists. The priority of the issue is then determined by the product of the consequence factor and probability factor.

$$\text{Consequence Factor} = (\text{Stability} + \text{Thermal} + \text{Voltage}) \times (\text{Load} + \text{Generation})$$

Stability and Thermal Factors		Voltage Factors	
Extreme, widespread	10	**Load Loss**	10
Severe, multiple	5	**Very Low (<0.8pu)**	5
Moderate, localized	2	**Low (<0.95pu)**	2
Minor, small impact	1	**High**	2
None	0	**None**	0
Load Affected		Generation Affected	
Total MW of load subjected to inadequate performance or required to drop to mitigate violations		Total MW of generation subjected to inadequate performance or required to drop to mitigate violations	

TABLE III-2: CONSEQUENCE RATING FACTORS

$$\text{Probability Factor} = \text{Seasonal Condition} \times \text{System Condition} \times \text{Time Frame}$$

Seasonal Condition Factors		System Condition Factors	
All Seasons	1	**P0 – All line in service**	1
Average (occurs frequently)	0.75	**P1 – N-1**	0.5
Light Loading	0.25	**P2, P4, P5, or P7 – Multiple outages**	0.1
Summer and Winter Peak	0.25	**P3 or P6 – N-1-1**	0.075
Summer or Winter Peak	0.125		
Time Frame Factor			
Present		1	
Future		$1/(Start - 2014)$	

TABLE III-3: PROBABILITY RATING FACTORS

	Consequence						Probability				
	Stability?	Thermal?	Voltage?	Total Load	Total Generation	Consequence Factor	Seasonal Condition?	System Condition?	Time Frame?	Probability Factor?	Priority Factor
P1											
Libby 230/115	0	5	0	41		205	0.750	0.500	1.0000	0.38	**76.88**
Addy - Kettle Falls Zone 2	2	0	0		45	90	1.000	0.500	1.0000	0.50	**45.00**
Nine Mile - Weside Zone 2	2	0	0		26	52	1.000	0.500	1.0000	0.50	**26.00**
Maintain voltage SOL's	0	0	2	100		200	0.250	0.500	1.0000	0.13	**25.00**
Hatwai 500/230	0	0	2	25		50	0.125	0.500	1.0000	0.06	**3.13**
P2											
Rathdrum Tie Breaker Failure	0	5	2	172		1204	0.750	0.100	1.0000	0.08	**90.30**
Sand Dunes Breaker Failure	0	5	5	103		1030	0.750	0.100	1.0000	0.08	**77.25**
Beacon Tie Breaker Failure	0	5	0	150		750	0.750	0.100	1.0000	0.08	**56.25**
Devils Gap East Bus Outage	5	0	0		32	160	1.000	0.100	1.0000	0.10	**16.00**
Bell S2 & S3 Tie Breaker Failure	0	5	0	22		110	0.125	0.100	1.0000	0.01	**1.38**
Sand Creek Bus Outage	0	0	2	41		82	0.125	0.100	0.2000	0.00	**0.21**
Ninth & Central Tie Breaker Failure	0	2	0	100		200	0.125	0.100	0.0556	0.00	**0.14**
P6											
Bell #6 230/115 + Beacon - Northeast	0	5	10	114		1710	1.000	0.075	1.0000	0.08	**128.25**
Moscow 230/115 + Shawnee 230/115	0	5	5	143		1430	1.000	0.075	1.0000	0.08	**107.25**
Benton - Othello + Sand Dunes - Warden #2	0	2	2	103		412	0.750	0.075	1.0000	0.06	**23.18**
Albeni Falls - Sand Creek + Cabinet 230/115	0	0	10	174		1740	0.125	0.075	1.0000	0.01	**16.31**
Dry Creek - North Lewiston 230 + Hatwai - Lolo	0	5	0	170		850	0.125	0.075	1.0000	0.01	**7.97**
Benewah - Pine Creek + Hatwai 500/230	0	2	0	300		600	0.125	0.075	1.0000	0.01	**5.63**
Airway Heights - Devils Gap + Nine Mile - Westside	0	2	0		37	74	0.750	0.075	1.0000	0.06	**4.16**
Devils Gap - Stratford + Larson - Stratford	0	2	0		22	44	0.750	0.075	1.0000	0.06	**2.48**
Dry Creek 230/115 + North Lewiston 230/115	0	1	0	14		14	0.125	0.075	1.0000	0.01	**0.13**
Beacon - Ross Park + Bell - Westside	0	2	0	100		200	0.125	0.075	0.0500	0.00	**0.09**
N-1-1 outages in L/C Area	0	2	0	50		100	0.125	0.075	0.0625	0.00	**0.06**
Airway Heights - Devils Gap + Metro - Post Street	0	1	0	50		50	0.125	0.075	0.1111	0.00	**0.05**
Boundary - Box Canyon - Colville + Addy 230/115	0	0	2	11		22	0.125	0.075	0.1000	0.00	**0.02**
Airway Heights Cap + Airway Heights - Garden Springs	0	0	2	12		24	0.125	0.075	0.0556	0.00	**0.01**
Francis & Cedar - Ross Park + Northwest - Westside	0	1	0	22		22	0.125	0.075	0.0556	0.00	**0.01**
Benewah - Pine Creek + Pine Creek #2 230/115	0	1	0	5		5	0.125	0.075	0.0500	0.00	**0.01**
Reliability Improvement											
Minimize generator tripping	0	2	0		400	800	0.750	0.000	1.0000	0.75	**600.00**
Improve Spokane Valley Reliability	0	1	0	210		210	0.750	0.000	1.0000	0.75	**157.50**
L/C High Voltage	0	0	2	100		200	0.750	0.000	1.0000	0.75	**150.00**
Spokane Low Voltages	0	0	2	100		200	0.125	0.000	1.0000	0.13	**25.00**
West Spokane Reinforcement	0	2	0	100		200	0.125	0.000	1.0000	0.13	**12.50**
Stratford - Wilson Creek section	0	0	2	28		56	0.125	0.000	0.2000	0.03	**1.40**
Diamond - Shawnee Section	0	1	2	7		21	0.125	0.000	0.0526	0.01	**0.14**

TABLE III-4: PERFORMANCE ISSUE PRIORITIZATION

The process to prioritize performance issues is under development. The results shown in Table III-4 are derived from the first iteration of a process. Subsequent planning assessment will include improved processes to reduce the subjective nature of assigning weight factors to each performance issue. Further improvements can be seen by incorporating the issues intended to be addressed by further single system projects. The present Avista budgeting process is intended to prioritize projects through business cases which may be presented as either individual projects or programs containing several projects. The concept of prioritizing performance issues is both evolutionary and revolutionary to Avista's present methodologies.

3 BIG BEND AREA

3.1 Executive Summary

The Big Bend area transmission system demonstrated performance issues in the near term and long term planning horizons. Several performance issues exist in the present state of the system and worsen with time. The most severe performance issue in the Big Bend area is caused by the breaker failure of GB1250 at Grant County PUD's Sand Dunes Station. The area's dependence on the Sand Dunes Station leaves the system with a single point of failure causing widespread performance issues.

Completion of the Benton – Othello SS 115 kV Transmission Line Rebuild project will provide greatly improved transmission system performance in the near and long term planning horizon. Further improvements are made through additional reconductor projects and the addition of communication aided protection schemes.

A list of the corrective action plans proposed for the Big Bend area is provided in Table III-5.

	Year Problem Starts	Construction Start	Construction End	Consequence	Risk Factor	Priority	Cost Estimate
1-Completed							
Chelan - Stratford 115 kV Transmission Line River Crossing						0.0100	
Stratford 115 kV Station Rebuild						0.0100	
2-Planned							
Addy - Devils Gap 115 kV Transmission Line Reconductor	Present	2017	2018	74	0.0563	4.1625	$2,025,000
Benton - Othello SS 115 kV Transmission Line Rebuild	Present	2015	2016	1030	0.0750	77.2500	$7,100,000
3-Needs Further Analysis							
Addy - Kettle Falls Protection Scheme	Present			90	0.5000	45.0000	$1,000,000
Chelan - Stratford 115 kV Transmission Line Rebuild	Present			44	0.0563	2.4750	$13,000,000
Lind – Warden 115 kV Transmission Line Rebuild	2033			21	0.0066	0.1382	$9,000,000
Saddle Mountain Integration	Present			412	0.0563	23.1750	$16,400,000
4-Conceptual							
Devils Gap Station Reconfiguration	Present			160	0.1000	16.0000	$3,000,000
Kettle Falls Capacitor Bank	2024			22	0.0009	0.0206	$500,000
Devils Gap - Stratford 115 kV Transmission Line Rebuild	2019			56	0.0250	1.4000	$30,100,000

TABLE III-5: BIG BEND CORRECTIVE ACTION PLANS

Additional projects not categorized as corrective action plans are listed in Table III-6.

	Construction Start	Construction End	Cost Estimate
1-Completed			
Odessa Cap Bank			
2-Planned			
Devils Gap - Lind 115 kV Transmission Line Rebuild	2015	2016	$7,997,700
Ford Station Rebuild	2018	2019	$1,275,000
Gifford Station Rebuild	2015	2015	$1,200,000
Harrington Station Rebuild	2015	2016	$3,000,000
Little Falls Station Rebuild	2015	2017	$4,275,000
Valley Station Rebuild	2019	2019	$1,000,000
3-Needs Further Analysis			
49 Degrees Station			
Bruce Siding Station			
Lee and Reynolds Transformation			

TABLE III-6: BIG BEND FURTHER SINGLE SYSTEM PROJECTS

3.2 System Description

The Avista Big Bend area is located primarily in the Ferry, Stevens, Pend Oreille, Lincoln, Grant, Adams, Franklin, and Walla Walla counties in the state of Washington. The majority of the load served in the area can be categorized as rural, low density load with areas around Warden that are highly influenced by irrigation load. Colville, Ritzville, and Othello represent the largest urban loads in the Big Bend. The 2015 net peak summer loading within Big Bend was around 100 MW's.

The west portion of the 115 kV transmission system in the Big Bend area is operated with normally open points referred to as "star points". A star point is used to minimize power flow to mitigate overloads on the 115 kV system in the event of an outage on the overlying 230 kV or 500 kV transmission system. These overloads also occur with no outages on the 230 kV and 500 kV systems throughout the summer during high east to west transfers, therefore these lines cannot be operated normally closed. Operating in a "star" configuration reduces exposure to loads served by long transmission lines and also reduces overall system losses in the area. In the Big Bend area, "star point" switches may be operated open or closed based on outages, specific flow conditions, or due to operational constraints. The areas around Colville and Othello are operated as a network, with the 115 kV lines closed-in. The central area around Lind is primarily operated in a "star point" configuration with the 115 kV lines open.

3.2.1 Area Transmission

Transmission Lines

The main 230 kV transmission lines in the northern portion of the Big Bend area are:

- Boundary – Addy – Bell (BPA)
- Boundary – Cusick – Usk – Bell (BPA)
- Boundary – Sacheen – Bell (BPA).

In the western portion the 230 kV transmission lines are:

- Columbia – Larson (GCPD)
- Larson – Wheeler – Sand Dunes (GCPD)
- Sand Dunes –Frenchman Hills – Midway (GCPD).

In the southern portion the 230 kV transmission lines are[4]:

- Wanapum – Walla Walla (AVA/PACW)

[4] The southern portion 230 kV transmission lines do not serve any Big Bend area load; they merely cross the geographic area.

- Talbot – Walla Walla (PACW)
- Talbot – Dry Creek (AVA/PACW).

Transmission Sources

The main transmission sources that feed the load in the Big Bend area are:

- 230/115 kV, 167 MVA transformer at Boundary (POPD)
- 230/115 kV, 150 MVA transformer at Addy (BPA)
- 230/115 kV, 250 MVA transformer at Larson (GCPD)
- 230/115 kV, 250 MVA transformer at Sand Dunes (GCPD)
- 230/115 kV, 280 MVA transformer at Benton (BPA).

3.2.2 Area Generation

Non-Avista owned local generation facilities within the Big Bend area include the following:

- Main Canal HED Unit 1 @ 22 MW CBH[5]
- Summer Falls HED Unit 1 & 2 @ 46.2 MW CBH

The following are active Generation Interconnection Requests within the Big Bend area:

- Project #43 150 MW Near Lind Station
- Project #46 126 MW Walla Walla – Wanapum 230 kV Transmission Line

[5] Main Canal and Summer Falls are owned by the Columbia Basin Hydropower, operated by and telemetered into Seattle City Light

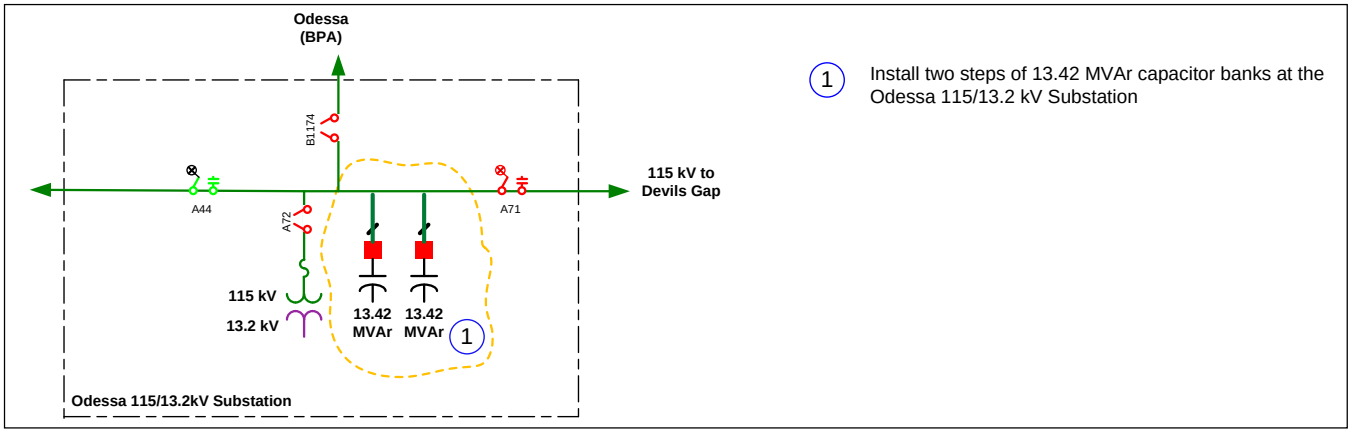
3.3 Corrective Action Plans

3.3.1 Completed

Odessa Capacitor Bank

Two steps of 13.42 MVAr capacitor banks were installed at Odessa Station to improve restoration capability to stations connected to the Devils Gap – Stratford 115 kV Transmission Line during outage conditions. The capacitor bank addition required expanding the existing station property.

Construction was completed in summer 2014.



Chelan – Stratford 115 kV Transmission Line River Crossing

Project Scope/Description

The Chelan – Stratford 115 kV Transmission Line is 49.36 miles long. Avista owns 49.12 miles of the transmission line, which includes the Columbia River crossing. The Chelan – Headwork section of the transmission line overloads during light summer conditions for outages causing the loss of the Larson – Stratford 115 kV Transmission Line. The conductor types, lengths and current capacity on the Chelan – Headworks section of the transmission line are 250 CU for 33.89 miles with 85.9 MVA capacity at 40 ° C ambient temperature, 19#8 CW for 0.39 miles with 78.3 MVA capacity at 40 ° C ambient temperature and 556.5 for 0.53 miles with 115 MVA capacity at 40 ° C ambient temperature. Reconductoring the 19#8 CW conductor to 795 ACSS will mitigate the performance issues observed in the light summer conditions in the ten year planning horizon for all contingencies except the P6 N-1: Devils Gap - Stratford 115 kV (STR-WIL) + N-1: Larson - Stratford 115 kV.

Replacing the 19#8 CW conductor on the Chelan – Stratford 115 kV Transmission Line does not address all of the observed performance issues.

Construction was completed in Winter 2015.

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Chelan – Stratford 115 kV Reconductor Study Report

Stratford 115 kV Station Rebuild

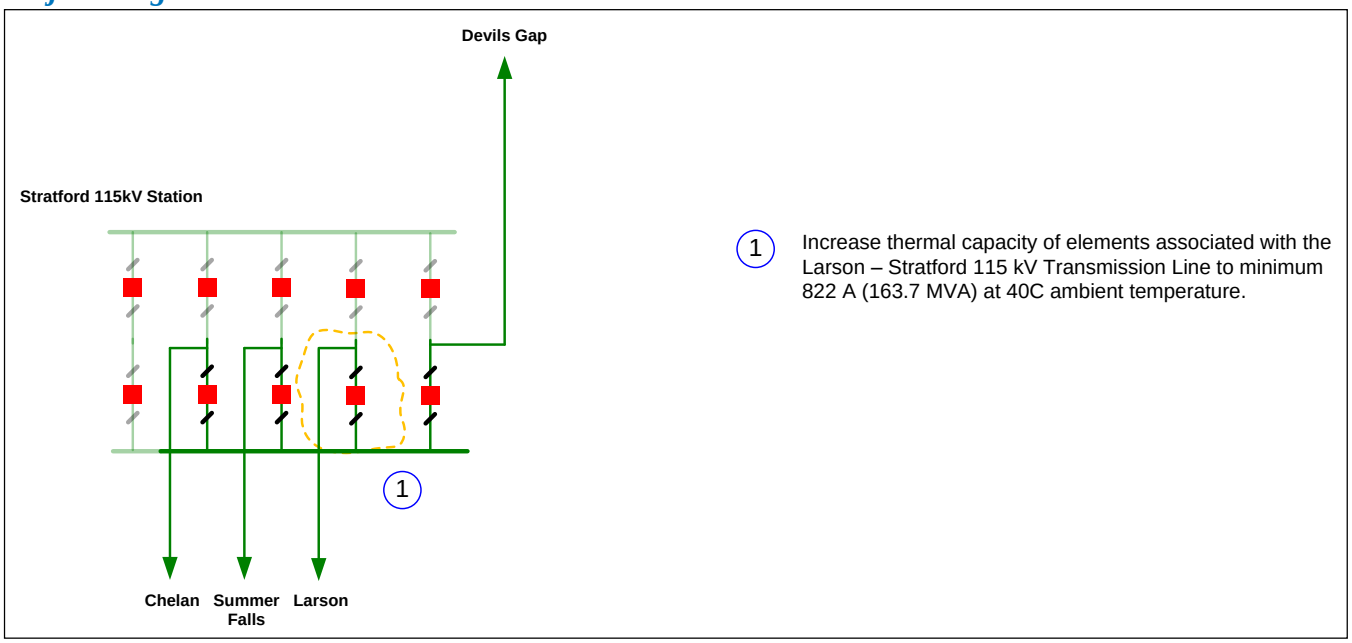
Project Scope/Description

The Larson – Stratford 115 kV Transmission Line shows overloads for the P6 N-1: Columbia - Larson 230 kV + N-1: Devils Gap - Stratford 115 kV (STR-WIL) contingency with no system adjustments between outages. The current transformer and strain bus conductor within the Stratford Station are the most limiting elements. The Stratford Station will be completely rebuilt due to Substation Engineering requirements and the transmission line constraints will be mitigated.

Completion of the project will mitigate the performance issues within the ten year planning horizon.

Construction was completed Summer 2014.

Project Diagram



Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Stratford Station Rebuild Study

3.3.2 Planned

Addy – Devils Gap 115 kV Transmission Line Reconductor

Project Scope/Description

The Ford – Long Lake Tap segment of the Addy – Devil's Gap 115 kV Transmission Line fails to meet performance requirements for the outage of Airway Heights – Devil's Gap and Devil's Gap – Nine Mile 115 kV transmission lines. The transmission line segment under consideration is 5.19 miles long, and it is primarily constructed with 266.8 ACSR and 397.5 ACSR conductor with a rating of 71.5 MVA at 40C. The new conductor will be 556 kcmil conductor with a minimum thermal capacity rating of 120 MVA at 40C.

Completion of the project will mitigate the performance issues within the ten year planning horizon.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 Heavy Summer and Heavy Winter.

The project is scheduled to be completed by the end of 2016.

Performance Criteria Violations

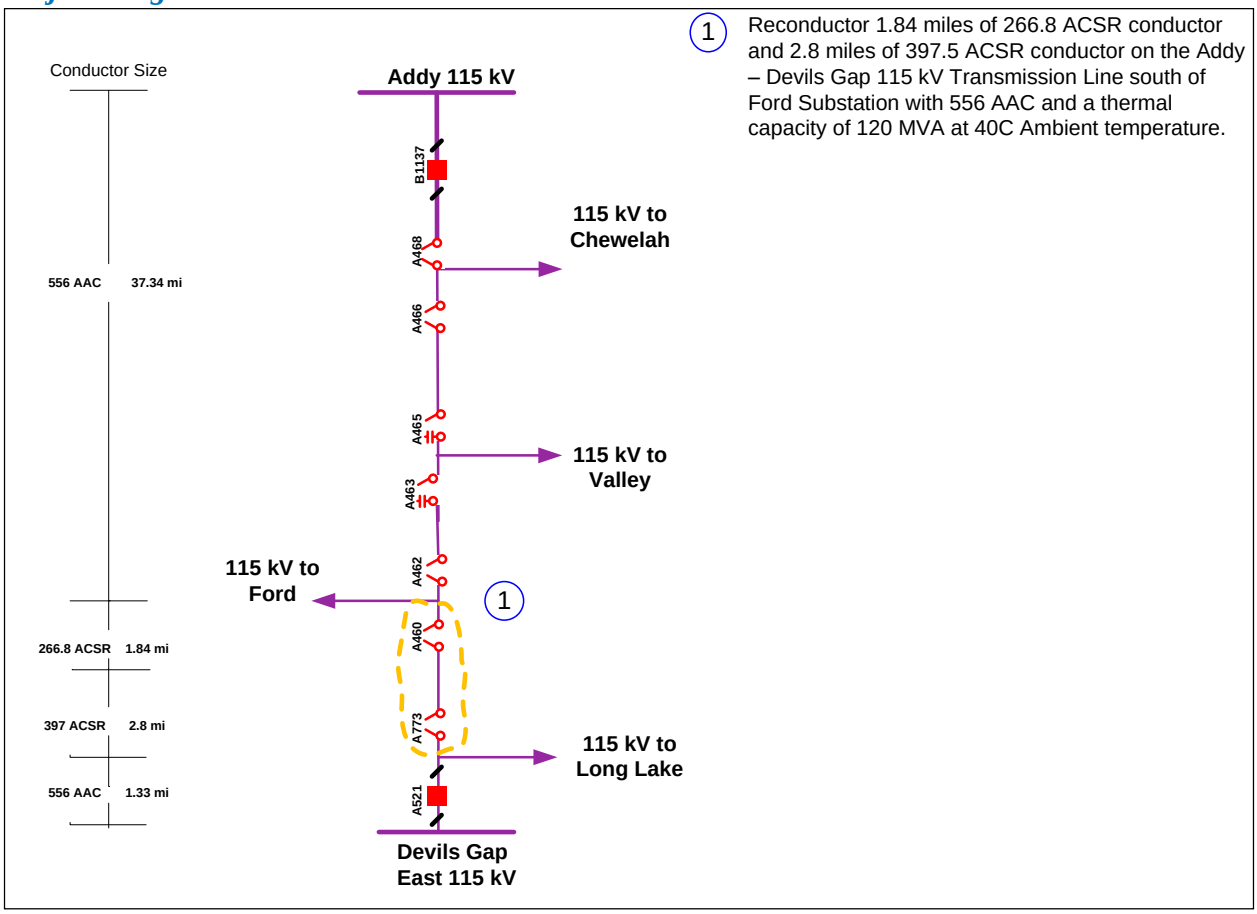
Heavy Summer Scenario

Row Labels	16HS	20HS	25HS	35HS
NA				
RES: N-2 (ROW and ADJ): Airway Heights - Devils Gap 115 kV and Devils Gap - Nine Mile 115 kV				
LONGLAKT (48203) -> FORD (48123) CKT 1	127.1 %	127.1 %	125.8 %	123.9 %
P6				
N-1: Airway Heights - Devils Gap 115 kV + N-1: Devils Gap - Nine Mile 115 kV				
LONGLAKT (48203) -> FORD (48123) CKT 1	126.9 %	127.0 %	125.9 %	124.0 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Nine Mile - Westside 115 kV				
LONGLAKT (48203) -> FORD (48123) CKT 1	135.4 %	135.4 %	134.3 %	132.5 %
SSEE				
N-2 (ROW and ADJ): Airway Heights - Devils Gap 115 kV and Devils Gap - Nine Mile 115 kV				
LONGLAKT (48203) -> FORD (48123) CKT 1	126.9 %	127.0 %	125.9 %	124.0 %

Heavy Winter Scenario

Row Labels	25HW	35HW
SSEE		
SUB: Bell 500, 230 & 115 (BPA)		
LONGLAKT (48203) -> FORD (48123) CKT 1	106.6 %	111.0 %

Project Diagram



Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Addy – Devils Gap 115 kV Reconductor Study Report

Benton – Othello SS 115 kV Transmission Line Rebuild

Project Scope/Description

The 2015 System Planning Assessment identified thermal capacity issues on the Avista owned segments of the Benton – Othello SS 115 kV Transmission Line. Stations served by the Benton – Othello SS 115 kV Transmission Line are observed with low voltages during several contingencies. Transmission Planning recommends the Avista owned portion of the Benton – Othello SS 115 kV Transmission Line be reconductored to a conductor capable of providing a minimum of 205 MVA thermal capacity at 40° C ambient temperature. The Bonneville Power Administration (BPA) owns 11 miles of the 37 mile transmission line. The portion of the transmission line owned by the BPA was rebuilt to 795 ACSR/TW (Toutle) conductor in 2013. The minimum proposed conductor of 205 MVA thermal capacity at 40° C Ambient temperature matches the thermal capacity of the conductor being used by the BPA for their portion of the transmission line.

Completion of the project will mitigate the performance issues within the ten year planning horizon.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2015 Heavy Summer.

The project is scheduled to be completed by the end of 2016.

As the table below shows there are many new potential violations that may occur after the project is implemented, this project would be considered the first phase to reinforce the area. With reconductoring Benton - Othello we have increased the flow through this “path”. The major 230 kV source from Benton flows north through Avista’s system, and/or the 230 kV sources through Grant system (depending on the contingency) flows through the Warden area to get to load. After this project is complete either Saddle Mountain Integration needs to be implemented or reconductor various lines.

Performance Criteria Violations

Row Labels	16HS	20HS	25HS	35HS	35HSPR OJECTS
P1					
N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					**101.2 %**
P2					
BF: A253 Warden 115 kV, Lind-Warden					
LEE&REYN (48308)		**0.9479**	**0.9431**	**0.9069**	
OTHELLO (48307)		**0.9485**	**0.9437**	**0.9075**	
OTHELOSS (48309)				**0.9172**	
SOTHELLO (48391)				**0.918**	
SOTHELOT (48393)				**0.9229**	
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1	**100.8 %**	**104.5 %**	**107.6 %**	**130.5 %**	
BF: A254 Warden 115 kV, Larson-Sand Dunes-Warden					
LEE&REYN (48308)		**0.9482**	**0.9434**	**0.9072**	
OTHELLO (48307)		**0.9488**	**0.944**	**0.9079**	
OTHELOSS (48309)				**0.9175**	
SOTHELLO (48391)				**0.9184**	
SOTHELOT (48393)				**0.9232**	

Row Labels	16HS	20HS	25HS	35HS	35HSPROJECTS
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1	101.0 %	104.5 %	107.6 %	130.5 %	
BF: GB1250 Sand Dunes 115 kV, Larson-Sand Dunes-Warden					
DELIGHT (47025)	0.8282	0.7864	0.7616	0.5799	0.9398
LIND (48187)	0.8304	0.7889	0.7643	0.5838	0.9416
MARENGO (48221)	0.8278	0.7861	0.7613	0.5797	0.9394
RALSTONB (47073)	0.8282	0.7866	0.7618	0.5803	0.9397
RITZVILL (48365)	0.8179	0.7755	0.7499	0.565	0.9295
ROXBORO (48375)	0.83	0.7903	0.767	0.5942	0.9387
WASHTUNA (48457)	0.8276	0.7858	0.7609	0.5788	0.9393
WARDEN A (48455)	0.8501	0.8135	0.7925	0.6335	
LEE&REYN (48308)	0.8515	0.8157	0.7953	0.6392	
OTHELLO (48307)	0.8523	0.8165	0.7962	0.6406	
OTHELOSS (48309)	0.8618	0.8268	0.8071	0.6567	
SOTHELLO (48391)	0.8673	0.8335	0.8145	0.6713	
SOTHELOT (48393)	0.8716	0.8382	0.8195	0.6779	
OTHELOSS (48309) -> OTHELLO (48307) CKT 1		101.4 %	106.0 %	148.5 %	100.2 %
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1	201.7 %	214.6 %	225.3 %	307.8 %	
SOTHELOT (48393) -> OTHELOSS (48309) CKT 1	162.7 %	172.1 %	179.8 %	245.1 %	
WARDEN A (48455) -> ROXBORO (48375) CKT 1				116.8 %	
BUS: Sand Dunes 115 kV					
DELIGHT (47025)	0.9394	0.9362	0.9474	0.9305	0.9395
LIND (48187)	0.941	0.9379	0.949	0.9323	0.9413
MARENGO (48221)	0.939	0.9358	0.947	0.9301	0.9391
RALSTONB (47073)	0.9393	0.9361	0.9473	0.9305	0.9395
RITZVILL (48365)	0.9302	0.9268	0.9378	0.9201	0.9292
ROXBORO (48375)	0.937	0.9341	0.9453	0.9298	0.9384
WASHTUNA (48457)	0.939	0.9358	0.947	0.93	0.9391
WARDEN A (48455)	05.5 %	0.9486		0.946	
LEE&REYN (48308)	0.9478	0.9447		0.9418	
OTHELLO (48307)	0.9481	0.945		0.942	
OTHELOSS (48309)				0.9487	
SOTHELLO (48391)		0.9499		0.9475	
BUS: Warden 115 kV					
LEE&REYN (48308)		0.9479	0.9431	0.9069	
OTHELLO (48307)		0.9485	0.9437	0.9075	
OTHELOSS (48309)				0.9172	
SOTHELLO (48391)				0.918	
SOTHELOT (48393)				0.9229	
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1	100.8 %	104.5 %	107.6 %	130.5 %	
N-1: Othello SS - Warden #2 115 kV Open @ WAR					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					101.2 %
P3					
G-1: Ice Harbor Units 1-6 + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					103.7 %
P6					
N-1: 3TM Larson - Sand Dunes - Warden 115 kV + N-1: Sand Dunes - Warden #2 115 kV					
OTHELOSS (48309) -> OTHELLO (48307) CKT 1		101.0 %	105.5 %	148.1 %	
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1	201.7 %	213.7 %	224.2 %	306.9 %	
SOTHELOT (48393) -> OTHELOSS (48309) CKT 1	162.7 %	171.5 %	178.9 %	244.5 %	
WARDEN A (48455) -> ROXBORO (48375) CKT 1				116.6 %	
N-1: 3TM Larson - Sand Dunes - Warden 115 kV + T-1: Sand Dunes 230/115 kV					
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1				101.0 %	
N-1: Ancient Lake - Frenchman 115 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					103.1 %
N-1: Benton - Midway 230 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1	111.1 %	120.3 %	121.8 %	132.1 %	140.7 %
N-1: Benton - Midway 230 kV + N-1: Sand Dunes - Warden #2 115 kV					
WARDEN T (46117) -> WARDEN A (48455) CKT 1					123.2 %
N-1: Benton - Midway 230 kV + T-1: White Bluff #1 230/115 kV					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1		100.9 %	101.7 %	106.5 %	116.7 %
OTHELOSS (48309) -> SOTHELOT (48393) CKT 1		112.5 %	112.9 %	110.2 %	
N-1: Benton - Othello SS 115 kV (BENT-SOT) + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1			102.7 %	117.8 %	117.7 %
N-1: Chelan - Manson 115 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.5 %

Row Labels	16HS	20HS	25HS	35HS	35HSPROJECTS
N-1: Columbia - Ancient Lake 115 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.3 %
N-1: Columbia - Larson 230 kV + N-1: Frenchman - Potholes (G) - Sand Dunes 230 kV					
DELIGHT (47025)		0.9406	0.9372	0.9353	0.9485
LIND (48187)		0.9423	0.9389	0.9371	
MARENGO (48221)		0.9402	0.9368	0.9349	0.9481
RALSTONB (47073)		0.9406	0.9372	0.9352	0.9484
RITZVILL (48365)	0.9487	0.9313	0.9275	0.9249	0.9382
ROXBORO (48375)		0.9384	0.9355	0.9343	0.9471
WASHTUNA (48457)		0.9402	0.9368	0.9348	0.948
LEE&REYN (48308)		0.9474	0.945	0.9447	
OTHELLO (48307)		0.9475	0.9451	0.9448	
SOTHELLO (48391)			0.9498		
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1	100.3 %			106.8 %	
N-1: Columbia - Larson 230 kV + N-1: Potholes - Sand Dunes 230 kV					
DELIGHT (47025)		0.9406	0.9372	0.9353	0.9485
LIND (48187)		0.9423	0.9389	0.9371	
MARENGO (48221)		0.9402	0.9368	0.9349	0.9481
RALSTONB (47073)		0.9406	0.9372	0.9352	0.9484
RITZVILL (48365)	0.9487	0.9313	0.9275	0.9249	0.9382
ROXBORO (48375)		0.9384	0.9355	0.9343	0.9471
WASHTUNA (48457)		0.9402	0.9368	0.9348	0.948
LEE&REYN (48308)		0.9474	0.945	0.9447	
OTHELLO (48307)		0.9475	0.9451	0.9448	
SOTHELLO (48391)			0.9498		
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1	100.3 %			106.8 %	
N-1: Columbia - Rocky Ford 115 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					103.9 %
N-1: Columbia - Wanapum 230 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.6 %
N-1: Devils Gap - Lind 115 kV (LIN-RIT) + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1				101.7 %	106.4 %
N-1: Devils Gap - Stratford 115 kV (STR-WIL) + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					104.9 %
N-1: Devils Gap - Stratford 115 kV (STR-WIL) + N-1: Sand Dunes - Warden #2 115 kV					
WARDEN T (46117) -> WARDEN A (48455) CKT 1					100.2 %
N-1: Dworshak - Hatwai 500 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1				102.5 %	108.1 %
N-1: Dworshak - Hatwai 500 kV + N-1: Sand Dunes - Warden #2 115 kV					
WARDEN T (46117) -> WARDEN A (48455) CKT 1					102.0 %
N-1: Dworshak - Taft 500 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1				102.1 %	107.7 %
N-1: Dworshak - Taft 500 kV + N-1: Sand Dunes - Warden #2 115 kV					
RITZVILL (48365)	0.9498				
WARDEN T (46117) -> WARDEN A (48455) CKT 1					101.7 %
N-1: Hatwai - Lower Granite 500 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					103.1 %
N-1: Larson - Wheeler 230 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1				100.5 %	105.1 %
N-1: Larson - Wheeler 230 kV + N-1: Sand Dunes - Warden #2 115 kV					
WARDEN T (46117) -> WARDEN A (48455) CKT 1					101.2 %
N-1: Lind - Shawnee 115 kV (LIN-EWN) + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.4 %
N-1: Lind - Warden 115 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1		100.9 %	102.5 %	112.5 %	119.9 %
N-1: Lind - Washtucna 115 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.5 %
N-1: Midway - Mattawa - Vantage 230 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					103.1 %
N-1: Midway - Mattawa - Wanapum 230 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					103.1 %

Row Labels	16HS	20HS	25HS	35HS	35HSPROJECTS
N-1: Othello SS - Warden #1 115 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
LEE&REYN (48308)		0.9482	0.9434	0.9072	
OTHELLO (48307)		0.9488	0.944	0.9078	
OTHELOSS (48309)				0.9175	
SOTHELLO (48391)				0.9184	
SOTHELOT (48393)				0.9232	
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1	100.8 %	104.5 %	107.6 %	130.5 %	
N-1: Othello SS - Warden #2 115 kV (WAR-L&R) + N-1: Sand Dunes - Wheeler 230 kV					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					106.7 %
N-1: Othello SS - Warden #2 115 kV (WAR-L&R) + N-1: Talbot - Walla Walla 230 kV					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.2 %
N-1: Othello SS - Warden #2 115 kV (WAR-L&R) + N-1: Walla Walla - Wanapum 230 kV					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.8 %
N-1: Othello SS - Warden #2 115 kV (WAR-L&R) + T-1: Benton 230/115 kV					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1	111.0 %	120.2 %	121.7 %	132.0 %	140.7 %
N-1: Othello SS - Warden #2 115 kV (WAR-L&R) + T-1: Hatwai 500/230 kV					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.5 %
N-1: Othello SS - Warden #2 115 kV (WAR-L&R) + T-1: Sickler-Douglas #1 500/230 kV					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					104.1 %
N-1: Othello SS - Warden #2 115 kV (WAR-L&R) + T-1: White Bluff #1 230/115 kV					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1	100.9 %	109.2 %	110.6 %	120.6 %	128.1 %
N-1: Sand Dunes - Warden #2 115 kV + N-1: Sand Dunes - Wheeler 230 kV					
WARDEN T (46117) -> WARDEN A (48455) CKT 1					100.9 %
N-1: Sand Dunes - Warden #2 115 kV + T-1: Benton 230/115 kV					
WARDEN T (46117) -> WARDEN A (48455) CKT 1					123.2 %
N-1: Sand Dunes - Warden #2 115 kV + T-1: White Bluff #1 230/115 kV					
WARDEN T (46117) -> WARDEN A (48455) CKT 1					115.2 %
N-1: Sand Dunes - Wheeler 230 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1				102.2 %	106.7 %
N-1: Sand Dunes - Wheeler 230 kV + N-1: Sand Dunes - Warden #2 115 kV					
WARDEN T (46117) -> WARDEN A (48455) CKT 1					100.9 %
N-1: Talbot - Walla Walla 230 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.2 %
N-1: Walla Walla - Wanapum 230 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.8 %
S-1: San Dunes 115kV Switched Shunt + T-1: Sand Dunes 230/115 kV					
RITZVILL (48365)				0.945	
T-1: Benton 230/115 kV + T-1: White Bluff #1 230/115 kV					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1		100.9 %	101.7 %	106.5 %	116.7 %
OTHELOSS (48309) -> SOTHELOT (48393) CKT 1		112.5 %	112.9 %	110.2 %	
T-1: Frenchman Hills 230/115 kV + T-1: Sand Dunes 230/115 kV					
RITZVILL (48365)				0.9496	
T-1: Hatwai 500/230 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					102.5 %
T-1: Sickler-Douglas #1 500/230 kV + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)					
WARDEN A (48455) -> OTHELOSS (48309) CKT 1					104.1 %

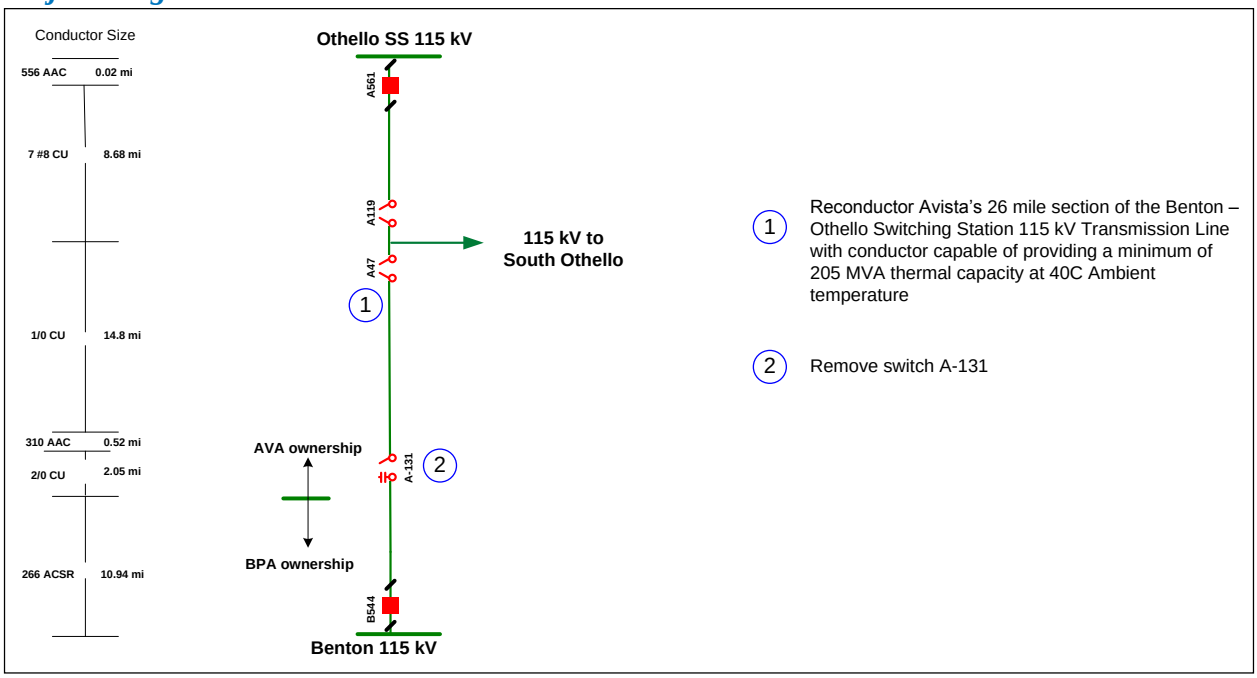
Potential violations identified in all scenarios. Violations are most severe in summer scenario.

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Benton – Othello SS 115 kV Reconductor Study Report

Project Diagram



3.3.3 Need Further Analysis

The following sections describe system deficiencies assuming completion of the planned projects as described above.

Lind – Warden 115 kV Transmission Line Rebuild

Project Scope/Description

The Roxboro – Warden segment of the Lind – Warden 115 kV Transmission Line is proposed to be reconductored with 795 ACSR conductor with a minimum thermal capacity of 150 MVA at 40C. The reconductor project will mitigate thermal overloads on the transmission line during restoration of service to stations connected to the Devils Gap – Lind and Lind – Shawnee 115 kV transmission lines. The section from Warden to Roxboro is 21 miles and consists primarily of 7#8 CU conductor with a rating of 57 MVA at 40C.

The Lind – Warden 115 kV Transmission Line show thermal overloads for various outages in the Big Bend area. The observed overloads are primarily caused by significant increase in reactive power flow due to loss of sources to the Warden Station. Mitigating the issues related to losing sources at Warden Station will mitigate the observed thermal overloads on the Lind – Warden 115 kV Transmission Line without the need to reconductor the transmission line.

Timeline

System performance analysis indicates an inability of the System to restore service to customers under conditions represent 2035 heavy summer.

Performance Criteria Violations

Row Labels	16HS	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
P2				
BF: GB1250 Sand Dunes 115 kV, Larson-Sand Dunes-Warden				
DELIGHT (47025)	0.8282	0.9462	0.9387	0.9398
LIND (48187)	0.8304	0.9479	0.9404	0.9416
MARENGO (48221)	0.8278	0.9459	0.9383	0.9394
RALSTONB (47073)	0.8282	0.9462	0.9386	0.9397
RITZVILL (48365)	0.8179	0.937	0.929	0.9295
ROXBORO (48375)	0.83	0.9439	0.9369	0.9387
WASHTUNA (48457)	0.8276	0.9459	0.9383	0.9393
WARDEN A (48455)	0.8501			
LEE&REYN (48308)	0.8515			
OTHELLO (48307)	0.8523			
OTHELOSS (48309)	0.8618			
SOTHELLO (48391)	0.8673			
SOTHELOT (48393)	0.8716			
OTHELOSS (48309) -> OTHELLO (48307) CKT 1				100.2 %
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1	201.7 %			
SOTHELOT (48393) -> OTHELOSS (48309) CKT 1	162.7 %			
P6				
N-1: 3TM Larson - Sand Dunes - Warden 115 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)	0.8281	0.9482	0.9407	0.942
LIND (48187)	0.8304	0.9499	0.9424	0.9438
MARENGO (48221)	0.8278	0.9478	0.9403	0.9416
RALSTONB (47073)	0.8282	0.9482	0.9407	0.942
RITZVILL (48365)	0.8179	0.939	0.931	
ROXBORO (48375)	0.83	0.9458	0.9389	
WASHTUNA (48457)	0.8276	0.9478	0.9403	0.9416
WARDEN A (48455)	0.85			
LEE&REYN (48308)	0.8515			

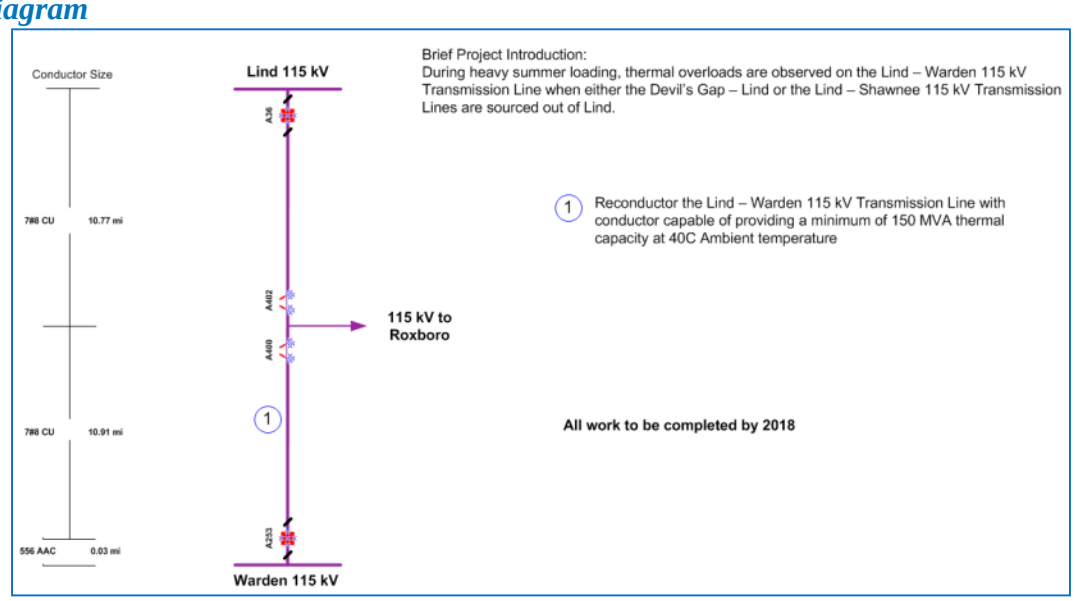
Row Labels	16HS	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
OTHELLO (48307)	0.8522			
OTHELOSS (48309)	0.8618			
SOTHELLO (48391)	0.8672			
SOTHELOT (48393)	0.8716			
BENTNAVA (48039) -> SOTHELOT (48393) CKT 1	201.7 %			
SOTHELOT (48393) -> OTHELOSS (48309) CKT 1	162.7 %			

Potential violations identified in all scenarios. Violations are most severe in summer scenario.

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

Project Diagram



Chelan – Stratford 115 kV Transmission Line Rebuild

Project Scope/Description

The Chelan – Headworks Tap segment of the Chelan – Stratford 115 kV Transmission Line failed to meet performance requirements beginning in 2014 for several outages around Larson Station. The transmission line segments under consideration are 0.38 miles of 19#8 CW and 33.89 miles of 250 CU conductor, leaving the line with a rating of 78.3 MVA at 40C. The new line will be 556 kcmil conductor with a minimum thermal capacity rating of 120 MVA at 40C. This rating is enough to mitigate thermal violations over the ten year planning horizon.

During heavy summer and light summer conditions, the outage of the Larson – Stratford and Devils Gap – Stratford 115 kV transmission lines causes generation from Summer Falls and Main Canal to exceed the thermal facility ratings on the Chelan – Stratford 115 kV Transmission Line. A complete rebuild of the Chelan – Stratford 115 kV Transmission Line will mitigate the thermal overloads.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 heavy and light summer.

Performance Criteria Violations

Heavy Summer Scenario

Row Labels	16HS	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
P6				
N-1: Devils Gap - Stratford 115 kV (STR-WIL) + N-1: Larson - Stratford 115 kV				
HEADWORK (48149) -> CHELAN (46805) CKT 1	**116.1 %**	**115.7 %**	**115.3 %**	**114.5 %**
STRATFRD (48419) -> COULECTY (46021) CKT 1	**103.0 %**	**103.0 %**	**102.9 %**	**102.7 %**

Light Scenarios

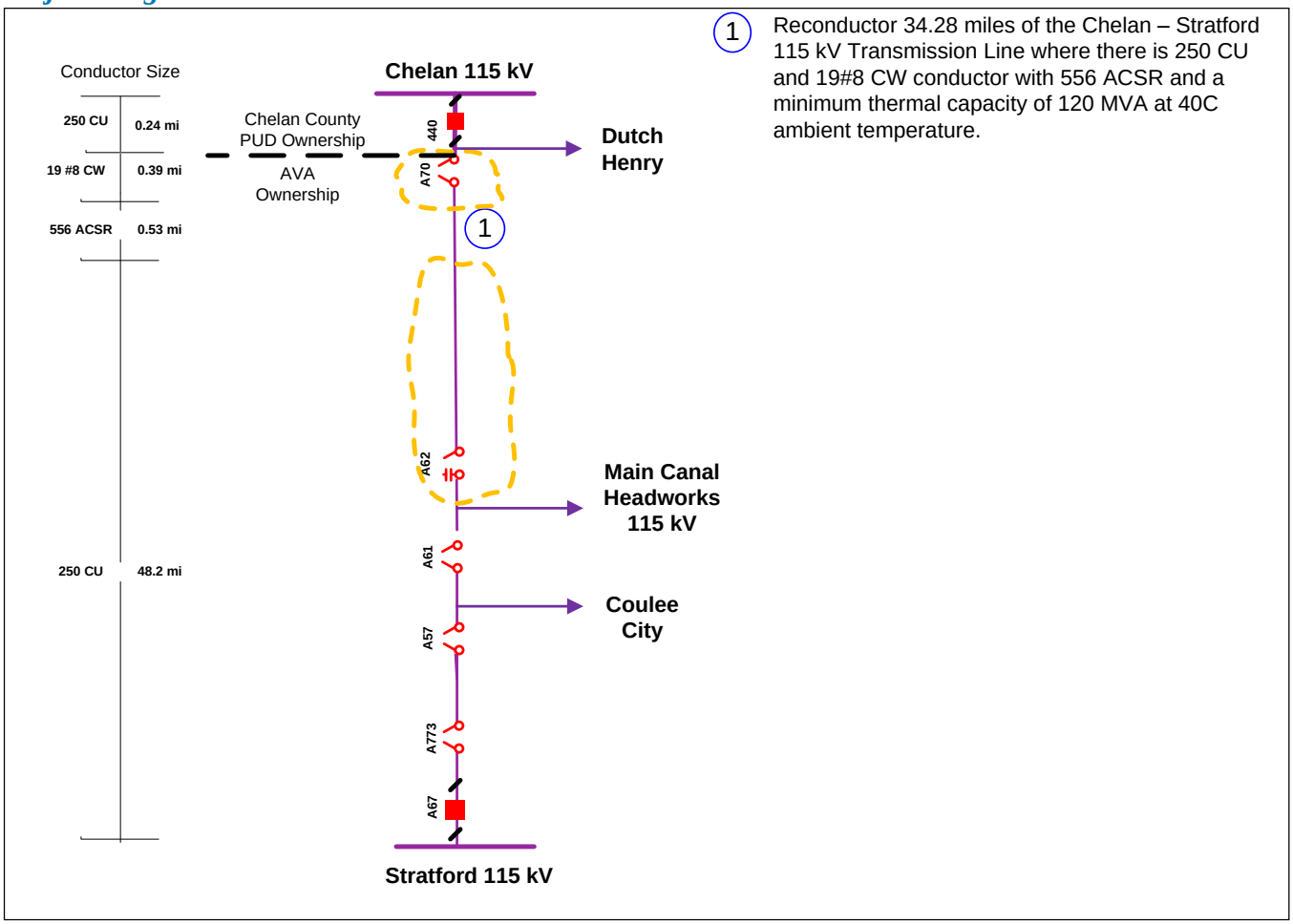
Row Labels	16LS	20LSPROJECTS
P1		
N-1: Larson - Stratford 115 kV		
HEADWORK (48149) -> CHELAN (46805) CKT 1	**102.4 %**	**101.9 %**
P2		
BF: GB1412 Larson 115 kV, Larson-Stratford		
HEADWORK (48149) -> CHELAN (46805) CKT 1	**102.3 %**	**101.8 %**
N-1: Larson - Stratford 115 kV Open @ STR		
HEADWORK (48149) -> CHELAN (46805) CKT 1	**102.4 %**	**101.9 %**
P6		
N-1: Devils Gap - Stratford 115 kV (STR-WIL) + N-1: Larson - Stratford 115 kV		
HEADWORK (48149) -> CHELAN (46805) CKT 1	**121.6 %**	**121.5 %**
STRATFRD (48419) -> COULECTY (46021) CKT 1	**102.9 %**	**102.9 %**

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Chelan – Stratford 115 kV Reconductor Study Report

Project Diagram



Saddle Mountain Integration

Project Scope/Description

The construction of a new 230/115 kV station at the intersection of the Walla Walla – Wanapum 230 kV and Benton – Othello SS 115 kV transmission lines is desired to mitigate performance criteria violations. The project will include the construction of a new 115 kV transmission line from the new station to Warden Station potentially utilizing existing transmission paths. Coordination with adjacent Transmission Planners and Planning Coordinators was initiated in Q4 of 2014. The Benton – Othello 115 kV Transmission Line Rebuild project, scheduled for completion in 2016, is not sufficient to mitigate the N-1-1 outage of Benton – Othello and Sand Dunes – Warden #2 115 kV transmission lines.

The local area around the Othello and Warden stations has performance issues during contingencies causing the outage of two or more transmission lines serving the area. The worst performing contingency is the N-1: Benton - Othello SS 115 kV (BENT-SOT) + N-1:

Sand Dunes - Warden #2 115 kV. A long term plan is under development for the Othello and Warden area. Presently the preferred plan of service includes a new 230 kV station on the Walla Walla – Wanapum 230 kV Transmission Line and interconnected to the 115 kV system. The project includes a new 115 kV transmission line from the new 230 kV station to Othello or Warden station.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 heavy summer.

Performance Criteria Violations

Row Labels	16HS	20HSPR OJECTS	25HSPR OJECTS	35HSPR OJECTS
NA				
RES: N-1: Lind - Warden 115 kV Open @ WAR				
LIND (48187)				0.95
ROXBORO (48375)	0.9413	0.9412	0.9383	0.932
P6				
N-1: Addy - Bell 115 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.9499
WASHTUNA (48457)				0.9499
N-1: Bell - Coulee #3 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.9499
WASHTUNA (48457)				0.9498
N-1: Bell - Coulee #5 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.9499
WASHTUNA (48457)				0.9499
N-1: Benewah - Boulder 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.9499
WASHTUNA (48457)				0.9499
N-1: Benewah - Moscow 230 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.9499
WASHTUNA (48457)				0.9499
N-1: Benton - Midway 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)		0.9425	0.9394	0.9394
LIND (48187)		0.9441	0.9411	0.9411
MARENGO (48221)		0.9421	0.939	0.939
RALSTONB (47073)		0.9424	0.9393	0.9393
RITZVILL (48365)	0.9495	0.9331	0.9297	
ROXBORO (48375)		0.9402	0.9376	
WASHTUNA (48457)		0.9421	0.9389	0.9389
LEE&REYN (48308)		0.9487	0.9466	0.9484
OTHELLO (48307)		0.9488	0.9467	0.9485
SOTHELLO (48391)			0.9482	
WARDEN T (46117) -> WARDEN A (48455) CKT 1	104.9 %			
N-1: Benton - Midway 230 kV + T-1: White Bluff #1 230/115 kV				
RITZVILL (48365)				0.9465
SOTHELLO (48391)				0.9473
N-1: Benton - Othello SS 115 kV (BENT-SOT) + N-1: Columbia - Wanapum 230 kV				
RITZVILL (48365)				0.949
N-1: Benton - Othello SS 115 kV (BENT-SOT) + N-1: Dworshak - Hatwai 500 kV				
RITZVILL (48365)				0.9491
N-1: Benton - Othello SS 115 kV (BENT-SOT) + N-1: Frenchman - Sandunes 115 kV				
RITZVILL (48365)				0.9499
N-1: Benton - Othello SS 115 kV (BENT-SOT) + N-1: Larson - Stratford 115 kV				
RITZVILL (48365)				0.9493
N-1: Benton - Othello SS 115 kV (BENT-SOT) + N-1: Midway - Mattawa - Vantage 230 kV				
RITZVILL (48365)				0.9483
N-1: Benton - Othello SS 115 kV (BENT-SOT) + N-1: Midway - Mattawa - Wanapum 230 kV				
RITZVILL (48365)				0.9484
N-1: Benton - Othello SS 115 kV (BENT-SOT) + N-1: Othello SS - Warden #2 115 kV (WAR-L&R)				
LEE&REYN (48308)		0.9493	0.9464	0.9469

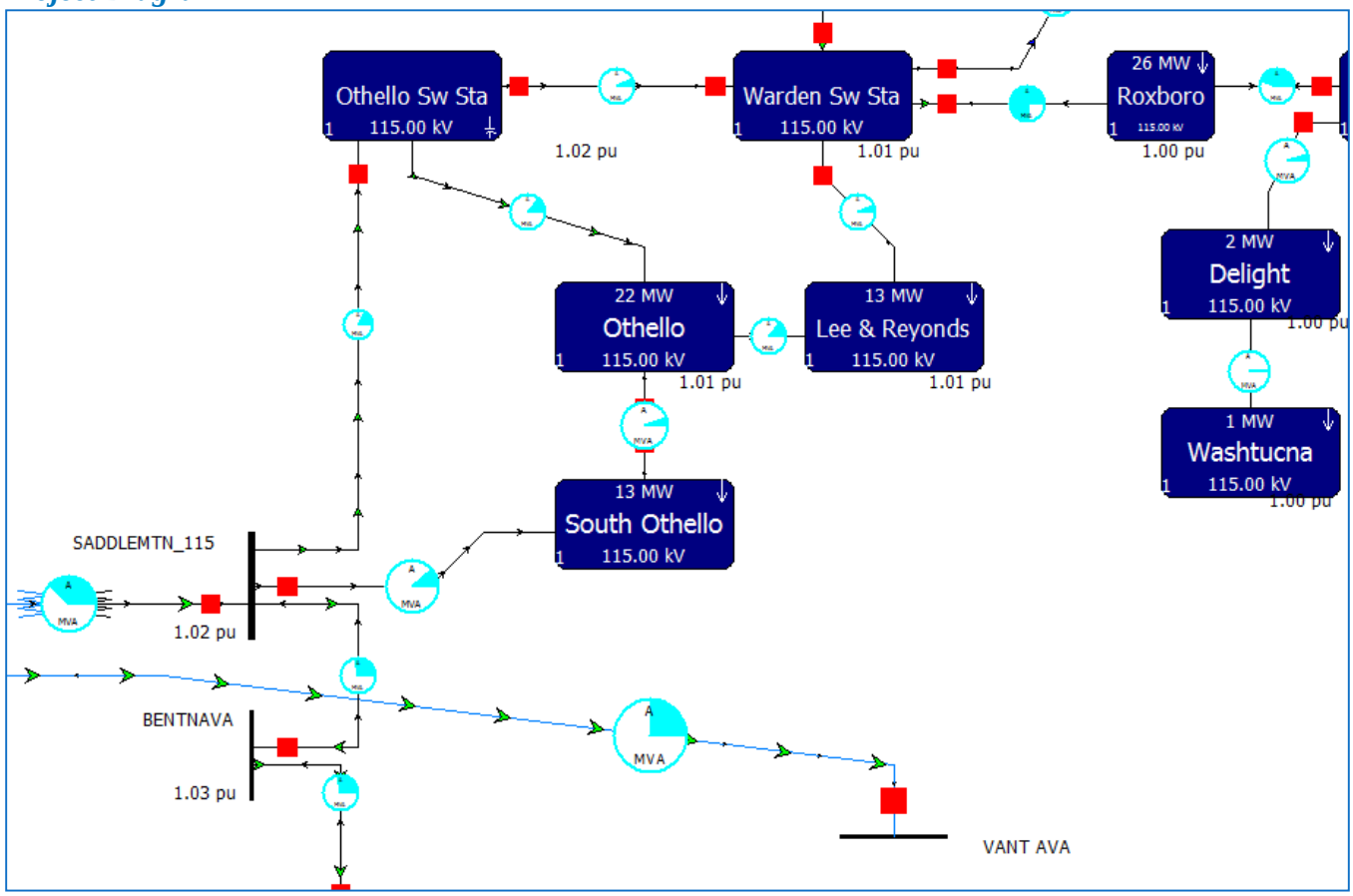
Row Labels	16HS	20HSPR OJECTS	25HSPR OJECTS	35HSPR OJECTS
OTHELLO (48307)		0.9498	0.947	0.9475
SOTHELLO (48391)			0.949	
N-1: Benton - Othello SS 115 kV (BENT-SOT) + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)	0.9204	0.9169	0.9105	0.8781
LIND (48187)	0.9221	0.9187	0.9123	0.8801
MARENGO (48221)	0.92	0.9165	0.9101	0.8777
RALSTONB (47073)	0.9203	0.9169	0.9105	0.8781
RITZVILL (48365)	0.911	0.9074	0.9005	0.8671
ROXBORO (48375)	0.9187	0.9156	0.9098	0.8793
WASHTUNA (48457)	0.92	0.9165	0.91	0.8775
WARDEN A (48455)	0.9335	0.931	0.926	0.8985
LEE&REYN (48308)	0.9246	0.9217	0.9163	0.8852
OTHELLO (48307)	0.9244	0.9215	0.916	0.8847
OTHELOSS (48309)	0.9274	0.9245	0.919	0.8882
SOTHELLO (48391)	0.9204	0.9189	0.9131	0.8815
SOTHELOT (48393)	0.9245	0.9231	0.9176	0.8866
WARDEN T (46117) -> WARDEN A (48455) CKT 1	123.5 %	125.8 %	129.1 %	147.7 %
N-1: Benton - Othello SS 115 kV (BENT-SOT) + S-1: Larson 115kV Switched Shunt				
RITZVILL (48365)				0.9494
N-1: Benton - Othello SS 115 kV (BENT-SOT) + S-1: Othello SS 115kV Switched Shunt				
MARENGO (48221)				0.9496
RITZVILL (48365)				0.9398
ROXBORO (48375)				0.9486
WASHTUNA (48457)				0.9496
LEE&REYN (48308)				0.9468
OTHELLO (48307)				0.946
OTHELOSS (48309)				0.948
SOTHELLO (48391)				0.9418
SOTHELOT (48393)				0.9465
N-1: Benton - Othello SS 115 kV (BENT-SOT) + S-1: San Dunes 115kV Switched Shunt				
RITZVILL (48365)			0.9487	0.9435
SOTHELLO (48391)				0.9489
N-1: Benton - Othello SS 115 kV (BENT-SOT) + T-1: Frenchman Hills 230/115 kV				
RITZVILL (48365)				0.9439
SOTHELLO (48391)				0.9492
N-1: Benton - Othello SS 115 kV (BENT-SOT) + T-1: Larson 230/115 kV				
RITZVILL (48365)				0.9431
SOTHELLO (48391)				0.9485
N-1: Benton - Othello SS 115 kV (BENT-SOT) + T-1: Sand Dunes 230/115 kV				
RITZVILL (48365)				0.9483
N-1: Benton - Othello SS 115 kV (OSS-SOT) + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)		0.9451	0.941	0.9173
LIND (48187)		0.9468	0.9427	0.9192
MARENGO (48221)		0.9447	0.9406	0.9169
RALSTONB (47073)		0.9451	0.941	0.9172
RITZVILL (48365)	0.946	0.9358	0.9314	
ROXBORO (48375)		0.9428	0.9392	
WASHTUNA (48457)		0.9447	0.9406	0.9168
WARDEN A (48455)				0.934
LEE&REYN (48308)			0.9483	0.9257
OTHELLO (48307)			0.9484	0.9256
OTHELOSS (48309)				0.9306
WARDEN T (46117) -> WARDEN A (48455) CKT 1	103.4 %	105.4 %	107.2 %	120.5 %
N-1: Brownlee - Hells Canyon 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.9497
MARENGO (48221)				0.9493
RALSTONB (47073)				0.9496
WASHTUNA (48457)				0.9492
N-1: Chelan - Stratford 115 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.95
WASHTUNA (48457)				0.95
N-1: Columbia - Larson 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)	0.9467			0.9467
LIND (48187)	0.9483			0.9485
MARENGO (48221)	0.9463			0.9463
RALSTONB (47073)	0.9466			0.9466

Row Labels	16HS	20HSPR OJECTS	25HSPR OJECTS	35HSPR OJECTS
RITZVILL (48365)	0.9376		0.9495	
ROXBORO (48375)	0.944			
WASHTUNA (48457)	0.9463			0.9463
N-1: Columbia - Rocky Ford 115 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.9481
LIND (48187)				0.9499
MARENGO (48221)				0.9477
RALSTONB (47073)				0.9481
WASHTUNA (48457)				0.9477
N-1: Columbia - Wanapum 230 kV + N-1: Benton - Othello SS 115 kV (BENT-SOT)				
RITZVILL (48365)				0.949
N-1: Columbia - Wanapum 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.9491
MARENGO (48221)				0.9487
RALSTONB (47073)				0.9491
WASHTUNA (48457)				0.9487
N-1: Conkelley - Libby 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.9499
WASHTUNA (48457)				0.9499
N-1: Coulee - Westside 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.9498
WASHTUNA (48457)				0.9498
N-1: Devils Gap - Stratford 115 kV (STR-WIL) + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.9499
MARENGO (48221)				0.9494
RALSTONB (47073)				0.9498
WASHTUNA (48457)				0.9494
N-1: Dry Creek - Talbot 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.9496
RALSTONB (47073)				0.9499
WASHTUNA (48457)				0.9496
N-1: Dworshak - Hatwai 500 kV + N-1: Benton - Othello SS 115 kV (BENT-SOT)				
RITZVILL (48365)				0.9491
N-1: Dworshak - Hatwai 500 kV + N-1: Sand Dunes - Warden #2 115 kV				
BENEWAH (48037)				1.0099
DELIGHT (47025)				0.9477
LIND (48187)				0.9494
MARENGO (48221)				0.9472
PINE CRK (48317)		1.0035	1.0034	1.0035
RALSTONB (47073)				0.9476
RITZVILL (48365)			0.9499	
WASHTUNA (48457)				0.9472
N-1: Dworshak - Taft 500 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.9466
LIND (48187)				0.9483
MARENGO (48221)				0.9462
PINE CRK (48317)		1.0047	1.0043	1.0044
RALSTONB (47073)				0.9465
RITZVILL (48365)			0.9488	
WASHTUNA (48457)				0.9461
N-1: Frenchman - Potholes (G) - Sand Dunes 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.9491
MARENGO (48221)				0.9487
RALSTONB (47073)				0.949
RITZVILL (48365)	0.9427			
ROXBORO (48375)	0.949			
WASHTUNA (48457)				0.9486
N-1: Hatwai - Lolo 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.9499
WASHTUNA (48457)				0.9499
N-1: Hatwai - Lower Granite 500 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.95
WASHTUNA (48457)				0.9499
N-1: Hatwai - Moscow 230 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
MOSCOW (48249)				1.0088
N-1: Hurricane- Walla Walla 230 kV + N-1: Sand Dunes - Warden #2 115 kV				

Row Labels	16HS	20HSPR OJECTS	25HSPR OJECTS	35HSPR OJECTS
MARENGO (48221)				0.9498
WASHTUNA (48457)				0.9498
N-1: Larson - Rocky Ford 115 kV + N-1: Sand Dunes - Warden #2 115 kV				
RITZVILL (48365)	0.9499			
N-1: Larson - Stratford 115 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.9497
MARENGO (48221)				0.9493
RALSTONB (47073)				0.9496
WASHTUNA (48457)				0.9492
N-1: Lolo - Oxbow 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.9496
MARENGO (48221)				0.9492
RALSTONB (47073)				0.9495
WASHTUNA (48457)				0.9492
N-1: Midway - Mattawa - Vantage 230 kV + N-1: Benton - Othello SS 115 kV (BENT-SOT)				
RITZVILL (48365)				0.9483
N-1: Midway - Mattawa - Vantage 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.9469
LIND (48187)				0.9486
MARENGO (48221)				0.9465
RALSTONB (47073)				0.9468
RITZVILL (48365)	0.9497		0.9491	
WASHTUNA (48457)				0.9464
N-1: Midway - Mattawa - Wanapum 230 kV + N-1: Benton - Othello SS 115 kV (BENT-SOT)				
RITZVILL (48365)				0.9484
N-1: Midway - Mattawa - Wanapum 230 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.947
LIND (48187)				0.9488
MARENGO (48221)				0.9466
RALSTONB (47073)				0.9469
RITZVILL (48365)	0.9498		0.9493	
WASHTUNA (48457)				0.9466
N-1: Othello SS - Warden #1 115 kV + N-1: Sand Dunes - Warden #2 115 kV				
DELIGHT (47025)				0.9477
LIND (48187)				0.9494
MARENGO (48221)				0.9473
RALSTONB (47073)				0.9476
RITZVILL (48365)	0.9499		0.9497	
WASHTUNA (48457)				0.9472
T-1: Sickler-Douglas #1 500/230 kV + N-1: Sand Dunes - Warden #2 115 kV				
MARENGO (48221)				0.9496
WASHTUNA (48457)				0.9496

Potential violations identified in all scenarios. Violations are most severe in summer scenario.

Project Diagram



Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Othello Area Transmission Feasibility Study

3.3.4 Conceptual

Devils Gap – Stratford 115 kV Transmission Line Rebuild

Project Scope/Description

Low voltage criteria violations occur at the station connected to the Devils Gap – Stratford 115 kV Transmission Line when the transmission line is operated open at Stratford Station. Capacitor banks were installed at Odessa station in 2014 but they are insufficient to hold the voltage in the long term planning horizon. A complete rebuild of the Devils Gap – Stratford 115 kV Transmission Line will improve voltage performance.

Timeline

System performance analysis indicates an inability of the System to reliably restore service to load in scenarios representing 2020 heavy summer.

Performance Criteria Violations

Heavy Summer Scenario

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
NA			
RES: BUS: Stratford 115 kV			
WILSNCKT (48471)	0.944	0.9373	0.9314
WILSONCK (46129)	0.9438	0.9371	0.9313
ODESSA (48295)		0.9497	0.9443

Potential violations identified in Heavy Summer low hydro, and light case scenarios. Heavy Summer scenario is most severe.

Kettle Falls Capacitor Bank

Project Scope/Description

The area around Kettle Falls station experiences low voltage in heavy winter scenarios with outages of the Addy 230/115 kV Transformer and Boundary – Box Canyon – Colville 115 kV Transmission Line. A capacitor bank at Kettle Falls Station will provide additional voltage support to the area mitigating low voltage issues.

Timeline

System performance analysis indicates an inability of the System to reliably restore service to load in scenarios representing 2016 heavy summer.

Performance Criteria Violations

Heavy Summer Scenario

Row Labels	16HS	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
P2				
BF: A388 Bell S2 & S3 230 kV				
ARDEN (48015)				**06.0 %**
COLV AVA (48083)				**06.0 %**
GIFFORD (48135)				**06.0 %**
GREENWDA (48143)				**06.0 %**
KETTLEAV (48175)				**06.0 %**
ORIN (48301)				**06.0 %**
BF: B1135 Addy 115 kV, Addy-Bell				
ARDEN (48015)	0.9433	0.9377	0.9317	**05.3 %**
COLV AVA (48083)	0.9446	0.939	0.9331	
GREENWDA (48143)	**06.0 %**	0.9456	0.94	
KETTLEAV (48175)	**05.6 %**	**05.7 %**	0.9451	
ORIN (48301)	0.9441	0.9385	0.9326	
BF: B1137 Addy 115 kV, Addy-Devils Gap				
ARDEN (48015)	0.9428	0.937	0.931	**05.4 %**
COLV AVA (48083)	0.944	0.9384	0.9324	
GREENWDA (48143)	**06.0 %**	0.945	0.9393	
KETTLEAV (48175)	**05.6 %**	0.9498	0.9444	
ORIN (48301)	0.9436	0.9379	0.9318	**05.1 %**
BUS: Addy 115 kV				
ARDEN (48015)	0.9426	0.9369	0.9308	**05.4 %**
COLV AVA (48083)	0.9439	0.9382	0.9322	
GREENWDA (48143)	**06.0 %**	0.9448	0.9392	
KETTLEAV (48175)	**05.6 %**	0.9497	0.9442	
ORIN (48301)	0.9434	0.9377	0.9317	**05.1 %**
P6				
N-1: 3TM Bell - Boundary #3 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				
ARDEN (48015)	0.9301			
CHEWELAH (48071)	0.9452			
COLV AVA (48083)	0.9248			
GIFFORD (48135)	0.9295			
GREENWDA (48143)	0.9237			
KETTLEAV (48175)	0.9239			
ORIN (48301)	0.9266			
N-1: 3TM Bell - Boundary #3 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				
ARDEN (48015)	0.9301			
CHEWELAH (48071)	0.9452			
COLV AVA (48083)	0.9248			
GIFFORD (48135)	0.9295			
GREENWDA (48143)	0.9237			
KETTLEAV (48175)	0.9239			
ORIN (48301)	0.9266			
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Kettle Falls Tap 115 kV				
COLV AVA (48083)		0.9475	0.944	
GREENWDA (48143)	0.9456	0.9424	0.9388	0.9452
KETTLEAV (48175)	0.9436	0.9403	0.9366	0.9429
ORIN (48301)			0.9473	
N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV + T-1: Addy #3 230/115 kV				
ARDEN (48015)	0.9327			
CHEWELAH (48071)	0.9475			
COLV AVA (48083)	0.9274			
GIFFORD (48135)	0.9322			
GREENWDA (48143)	0.9263			
KETTLEAV (48175)	0.9265			
ORIN (48301)	0.9292			
N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV + T-1: Addy #3 230/115 kV				
ARDEN (48015)	0.9327			
CHEWELAH (48071)	0.9475			
COLV AVA (48083)	0.9274			
GIFFORD (48135)	0.9322			
GREENWDA (48143)	0.9263			

Row Labels	16HS	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
KETTLEAV (48175)	0.9265			
ORIN (48301)	0.9292			
N-1: Kettle Falls Tap 115 kV + T-1: Addy #3 230/115 kV				
GREENWDA (48143)		0.9482	0.9448	
KETTLEAV (48175)	0.9482	0.9461	0.9426	0.9485
SSEE				
N-2 (ROW): Bell - Boundary #1 230 kV and Bell - Boundary #3 230 kV and Boundary - Usk 230 kV and 3TM Boundary - Box Canyon - Colville 115 kV				
ARDEN (48015)	0.9329			
CHEWELAH (48071)	0.9478			
COLV AVA (48083)	0.9277			
GIFFORD (48135)	0.9324			
GREENWDA (48143)	0.9266			
KETTLEAV (48175)	0.9268			
ORIN (48301)	0.9295			
VALLEY A (48441)	05.5 %			

Row Labels	16HS	20HS	25HS	35HS	35HSPROJECTS
P2					
BF: A388 Bell S2 & S3 230 kV					
ARDEN (48015)					06.0 %
COLV AVA (48083)					06.0 %
GIFFORD (48135)					06.0 %
GREENWDA (48143)					06.0 %
KETTLEAV (48175)					06.0 %
ORIN (48301)					06.0 %
BF: B1135 Addy 115 kV, Addy-Bell					
ARDEN (48015)	0.9433	0.9377	0.9317	05.3 %	05.3 %
COLV AVA (48083)	0.9446	0.939	0.9331		
GREENWDA (48143)	06.0 %	0.9456	0.94		
KETTLEAV (48175)	05.6 %	05.7 %	0.9451		
ORIN (48301)	0.9441	0.9385	0.9325	05.0 %	
BF: B1137 Addy 115 kV, Addy-Devils Gap					
ARDEN (48015)	0.9428	0.937	0.931	05.4 %	05.4 %
COLV AVA (48083)	0.944	0.9383	0.9324		
GREENWDA (48143)	06.0 %	0.9449	0.9393		
KETTLEAV (48175)	05.6 %	0.9497	0.9443		
ORIN (48301)	0.9436	0.9378	0.9318	05.1 %	05.1 %
BUS: Addy 115 kV					
ARDEN (48015)	0.9426	0.9368	0.9308	05.4 %	05.4 %
COLV AVA (48083)	0.9439	0.9382	0.9322		
GREENWDA (48143)	06.0 %	0.9448	0.9391		
KETTLEAV (48175)	05.6 %	0.9496	0.9442		
ORIN (48301)	0.9434	0.9377	0.9316	05.1 %	05.1 %
P6					
N-1: 3TM Bell - Boundary #3 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV					
ARDEN (48015)	0.9301				
CHEWELAH (48071)	0.9452				
COLV AVA (48083)	0.9248				
GIFFORD (48135)	0.9295				
GREENWDA (48143)	0.9237				
KETTLEAV (48175)	0.9239				
ORIN (48301)	0.9266				
N-1: 3TM Bell - Boundary #3 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV					
ARDEN (48015)	0.9301				
CHEWELAH (48071)	0.9452				
COLV AVA (48083)	0.9248				
GIFFORD (48135)	0.9295				

Row Labels	16HS	20HS	25HS	35HS	35HSPROJECTS
GREENWDA (48143)	0.9237				
KETTLEAV (48175)	0.9239				
ORIN (48301)	0.9266				
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Kettle Falls Tap 115 kV					
COLV AVA (48083)		0.9469	0.9433	0.9497	
GREENWDA (48143)	0.9456	0.9419	0.938	0.944	0.9452
KETTLEAV (48175)	0.9436	0.9398	0.9358	0.9417	0.9429
ORIN (48301)		0.95	0.9465		
N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV + T-1: Addy #3 230/115 kV					
ARDEN (48015)	0.9327				
CHEWELAH (48071)	0.9475				
COLV AVA (48083)	0.9274				
GIFFORD (48135)	0.9322				
GREENWDA (48143)	0.9263				
KETTLEAV (48175)	0.9265				
ORIN (48301)	0.9292				
N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV + T-1: Addy #3 230/115 kV					
ARDEN (48015)	0.9327				
CHEWELAH (48071)	0.9475				
COLV AVA (48083)	0.9274				
GIFFORD (48135)	0.9322				
GREENWDA (48143)	0.9263				
KETTLEAV (48175)	0.9265				
ORIN (48301)	0.9292				
N-1: Kettle Falls Tap 115 kV + T-1: Addy #3 230/115 kV					
COLV AVA (48083)			0.9493		
GREENWDA (48143)		0.9477	0.9441	0.9497	
KETTLEAV (48175)	0.9482	0.9456	0.9419	0.9474	0.9485

Potential violations identified in Heavy Summer low hydro, and Heavy Winter scenarios. Heavy Summer scenario is most severe.

Addy – Kettle Falls POTT Scheme

Project Scope/Description

Implementation of a high speed, communication aided tripping scheme on the Addy – Kettle Falls 115 kV Transmission Line is necessary to improve stability performance of the Kettle Falls units during zone 2 time delayed clearing of a fault on the Addy – Kettle Falls 115 kV Transmission Line near Addy Station. A new communication path is required between Addy and Kettle Falls Stations. Upgrades and setting changes to relays at each station are also required to implement Avista's standard permissive overreaching transfer trip scheme.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in requirement R4.1.1 of TPL-001-4 in scenarios representing 2016 heavy summer.

Performance Criteria Violations

Row Labels	16HW Max of Voltage Dip or Frequency	Max of Duration or Time	20HWPROJECTS Max of Voltage Dip or Frequency	Max of Duration or Time
P1				
N-1: Addy - Kettle Falls 115 kV 3P @ ADD				
Out of Step Generator				

Row Labels	16HW Max of Voltage Dip or Frequency	Max of Duration or Time	20HWPROJECTS Max of Voltage Dip or Frequency	Max of Duration or Time
KETTLEAV 14kV	OOS	1.6 s	OOS	1.6 s
WECC Category B Frequency				
KETTLEAV 13.8kV	59.2 Hz	8.5 ~	59.1 Hz	8.5 ~
WECC Category B Voltage Dip Load Bus				
COOK M T 115kV	-29.1 %		-29.3 %	
KETTLEAV 115kV	-27.8 %		-28.0 %	
KETTLEAV 13.8kV	-66.9 %		-67.4 %	
REPUBLIC 115kV	-29.2 %		-29.5 %	
WECC Category B Voltage Dip Load Bus Duration				
KETTLEAV 13.8kV	-66.9 %	INF	-67.4 %	INF

Potential violations identified in all scenarios. Heavy Winter scenario is most severe.

Devils Gap Station Reconfiguration

Project Scope/Description

During faults causing the clearing of the Devils Gap east bus, an island is created with the Little Falls units and load radially connected to the Devils Gap west bus. The ability for the Little Falls units to maintain acceptable voltage and frequency within the island depends on the present load and generation levels. Further analysis is necessary to determine existing generation protection schemes deployed and the capabilities of the existing and proposed controls systems installed on the Little Falls units.

The present configuration of Devils Gap Station has both Little Falls transmission lines connected to the west bus and both Long Lake transmission lines connected to the east bus. The configuration was initially developed to meet historical operational concepts associated with the West of Hatwai path. Following the redevelopment of how the local area is operated, a re-evaluation of the Devils Gap configuration did not occur. Conceptually, re-terminating the Little Falls and Long Lake transmission lines such that both lines to a single plant are not connected to the same Devils Gap bus will increase the reliability of the plants and eliminate the potential islanding condition for loss of the east bus.

Timeline

System performance analysis indicates an inability of the System to maintain a high level of reliability representing 2016 heavy summer.

Performance Criteria Violations

Row Labels	16HS		25HSPROJECTS	
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time
P2				
BUS: Devils Gap East 115 kV 3P				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.3 s**	OOS	**1.3 s**
LITFAL34 4kV	OOS	**1.3 s**	OOS	**1.3 s**
BUS: Devils Gap East 115 kV SLG				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.4 s**	OOS	**1.4 s**
LITFAL34 4kV	OOS	**1.4 s**	OOS	**1.4 s**
P4				
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @ADD)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.9 s**	OOS	**1.9 s**
LITFAL34 4kV	OOS	**1.9 s**	OOS	**1.9 s**
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @DGP)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.5 s**	OOS	**1.5 s**
LITFAL34 4kV	OOS	**1.5 s**	OOS	**1.5 s**
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @ADD)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.9 s**	OOS	**1.9 s**
LITFAL34 4kV	OOS	**1.9 s**	OOS	**1.9 s**
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @DGP)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.6 s**	OOS	**1.6 s**
LITFAL34 4kV	OOS	**1.6 s**	OOS	**1.6 s**
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV 3P (DGP-LL #1 @DGP)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.3 s**	OOS	**1.3 s**
LITFAL34 4kV	OOS	**1.3 s**	OOS	**1.3 s**
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV SLG (DGP-LL #1 @DGP)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.6 s**	OOS	**1.6 s**
LITFAL34 4kV	OOS	**1.6 s**	OOS	**1.6 s**
BF: A524 Devils Gap 115 kV, Devils Gap - Little Falls #1 115 kV 3P (DGP-LF #1 @DGP)				
Out of Step Generator				
LONGLKG1 4kV	OOS	**1.4 s**	OOS	**1.4 s**
LONGLKG2 4kV	OOS	**1.4 s**	OOS	**1.4 s**
LONGLKG3 4kV	OOS	**1.4 s**	OOS	**1.4 s**
LONGLKG4 4kV	OOS	**1.5 s**	OOS	**1.5 s**

Row Labels	16HS		25HSPROJECTS	
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @DGP)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.5 s**	OOS	**1.5 s**
LITFAL34 4kV	OOS	**1.5 s**	OOS	**1.5 s**
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @NMS)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.9 s**	OOS	**1.9 s**
LITFAL34 4kV	OOS	**1.9 s**	OOS	**1.9 s**
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @DGP)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.6 s**	OOS	**1.6 s**
LITFAL34 4kV	OOS	**1.6 s**	OOS	**1.6 s**
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @NMS)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.9 s**	OOS	**1.9 s**
LITFAL34 4kV	OOS	**1.9 s**	OOS	**1.9 s**
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @AIR)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.9 s**	OOS	**1.9 s**
LITFAL34 4kV	OOS	**1.9 s**	OOS	**1.9 s**
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @DGP)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.5 s**	OOS	**1.5 s**
LITFAL34 4kV	OOS	**1.5 s**	OOS	**1.5 s**
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @AIR)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.9 s**	OOS	**1.9 s**
LITFAL34 4kV	OOS	**1.9 s**	OOS	**1.9 s**
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @DGP)				
Out of Step Generator				
LITFAL12 4kV	OOS	**1.6 s**	OOS	**1.6 s**
LITFAL34 4kV	OOS	**1.6 s**	OOS	**1.6 s**
BF: A538 Devils Gap 115 kV, Devils Gap - Little Falls #2 115 kV 3P (DGP-LF #2 @DGP)				
Out of Step Generator				
LONGLKG1 4kV	OOS	**1.4 s**	OOS	**1.4 s**
LONGLKG2 4kV	OOS	**1.4 s**	OOS	**1.5 s**
LONGLKG3 4kV	OOS	**1.5 s**	OOS	**1.4 s**
LONGLKG4 4kV	OOS	**1.5 s**	OOS	**1.5 s**
BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV 3P (DGP-LL #2 @DGP)				

Row Labels	16HS		25HSPROJECTS	
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time
Out of Step Generator				
LITFAL12 4kV	OOS	1.3 s	OOS	1.3 s
LITFAL34 4kV	OOS	1.3 s	OOS	1.3 s
BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV SLG (DGP-LL #2 @DGP)				
Out of Step Generator				
LITFAL12 4kV	OOS	1.6 s	OOS	1.6 s
LITFAL34 4kV	OOS	1.6 s	OOS	1.6 s
P5				
PSF: Devils Gap East 115 kV SLG				
Out of Step Generator				
LITFAL12 4kV	OOS	1.9 s	OOS	1.9 s
LITFAL34 4kV	OOS	1.9 s	OOS	1.9 s
PSF: Devils Gap West 115 kV 3P				
Out of Step Generator				
LONGLKG1 4kV	OOS	1.5 s	OOS	1.5 s
LONGLKG2 4kV	OOS	1.5 s	OOS	1.5 s
LONGLKG3 4kV	OOS	1.5 s	OOS	1.5 s
LONGLKG4 4kV	OOS	1.5 s	OOS	1.5 s

Potential violations identified in all scenarios. Heavy Summer scenario is most severe.

3.3.5 New Proposals

There are no new proposed Corrective Action Plans planned for the Big Bend area.

3.4 Single System Projects (non-corrective action plans)

3.4.1 Devil's Gap – Lind 115 kV Transmission Line Structure Replacement

The age and condition of the Devil's Gap – Lind 115 kV Transmission Line has reached a trigger within the Avista Asset Management process, and this line will be rebuilt to current standards. No capacity change is expected.

3.4.2 Forty Nine Degrees Station

The 49 Degrees North Ski Resort added a new double chair lift in 2012 and a mid mountain lodge is scheduled for construction in summer 2014. This is phase one of their five phase master plan. The existing distribution is being reinforced to accommodate the planned expansion, but there is limited additional capacity. A dedicated feeder at a higher voltage level and a new transformation at Chewelah Station or a new distribution station and a 115 kV radial transmission tap line will be required if the resort continues to expand.

3.4.3 Ford Station Rebuild

Currently, Ford Station sits on land that the Dawn Mining Company needs to reclaim. They are required to fence and secure the non operational uranium mine property due to ongoing reclamation activities at the uranium mill site. This would require Avista to move the substation less than half a mile. This will be an opportunity to remove the (3) single phase 115/13 kV transformer bank and the 115/2.4 kV transformer. This project is also in the 5 to 10 year planning horizon and mentioned here for completeness.

3.4.4 Gifford Station Rebuild

There is currently a 115/34.5 kV, 12 MVA transformer serving load in the area. There is an additional (3) single phase 34.5/13.2 kV, 1500 kVA pole mounted, bucking transformation outside of the station. This project will add a new 115-13.2 kV, 3.75 MVA transformer, feeder position and regulator at the Gifford Station and create a new GIF12F1 feeder to serve the north branch load. The project is scheduled for construction in 2015.

3.4.5 Harrington Station Rebuild

Harrington is the last area Avista serves at the legacy 4 kV voltage. This voltage is obsolete for serving utility distribution systems and we have very limited spare equipment to continue service at this voltage. The Harrington station is very old and the transformer will be difficult and time consuming to replace if it fails. Avista does not have a 4 kV mobile substation, so all the customers served by Harrington feeders will be out of service until the transformer is replaced. This could easily be up to 48 hours.

3.4.6 Little Falls Station Rebuild

Several components of the Little Falls hydroelectric dam will be worked on or replaced during the several years. The exsting Little Falls Station integrates the generation to Avista's transmission system. The station's condition warrants a complete rebuild. The scheduled generation outages necessary for the generator replacement provides an opportunity to take outages at the station for construction of the rebuild.

3.4.7 Bruce Siding Station

Currently there is a large agricultural processing center about 6 miles east of Othello in addition to typical irrigation load. This area is served out of Lee & Reynolds Station by two, 5 mile long distribution feeders and the existing load is approximately 2.2 MW. A customer had proposed a new local industrial load in 2007, which would require a new distribution substation local to the area. This proposed load has been subsequently delayed. A new Bruce Siding Station remains a 5 to 10 year project, mentioned here for reference. The OthelloSS – Warden #2115 kV Transmission Line passes directly through the area and the station property has not been purchased.

3.4.8 Valley Station Rebuild

The Valley Station is planned to be rebuilt.

3.4.9 Lee and Reynolds Transformation

The Othello industrial district is home to some of our largest customers. Currently taking a transformer outage in the area is very difficult due to the high load factor and limited backup capacity. The first step in increasing operational flexibility in the area would be the addition of a second transformer at Lee and Reynolds. Currently L&R is one of two transformers on our system that serves 4 feeders, and in a semi-urban area. This is currently not scheduled, but should be looked at in the 5-10 year horizon.

3.5 Spare Equipment Study

Avista does not own any 230/115 kV autotransformers within the Big Bend area therefore, a spare equipment study was not conducted. The BPA and Grant County PUD's spare equipment methodology includes the ability to replace an autotransformer in less than one year.

3.6 Voltage Stability Study

A Load Ramp PV Curve analysis was conducted while monitoring all buses in the Big Bend area. All loads within the Big Bend area were increased until voltage collapse occurred. All additional generation necessary to supply the increase in load came from a distribution of all generation in WECC except those within the Big Bend area.

The theoretical flow limit is around 725 MW for all lines in service condition. The critical bus under all lines in service condition is Ritzville Station. As load increases in the Big Bend area, the limiting contingency is a breaker failure of GB1250 on the Sand Dunes 115 kV bus or the two overlapping singles of Larson - Sand Dunes – Warden 115 kV and Sand Dunes – Warden No. 2 115 kV Lines with total area load of around 220 MW (see Figure III-3). The critical bus under the GB1250 breaker failure contingency and the N-1-1 overlapping single contingency is Ritzville Station.

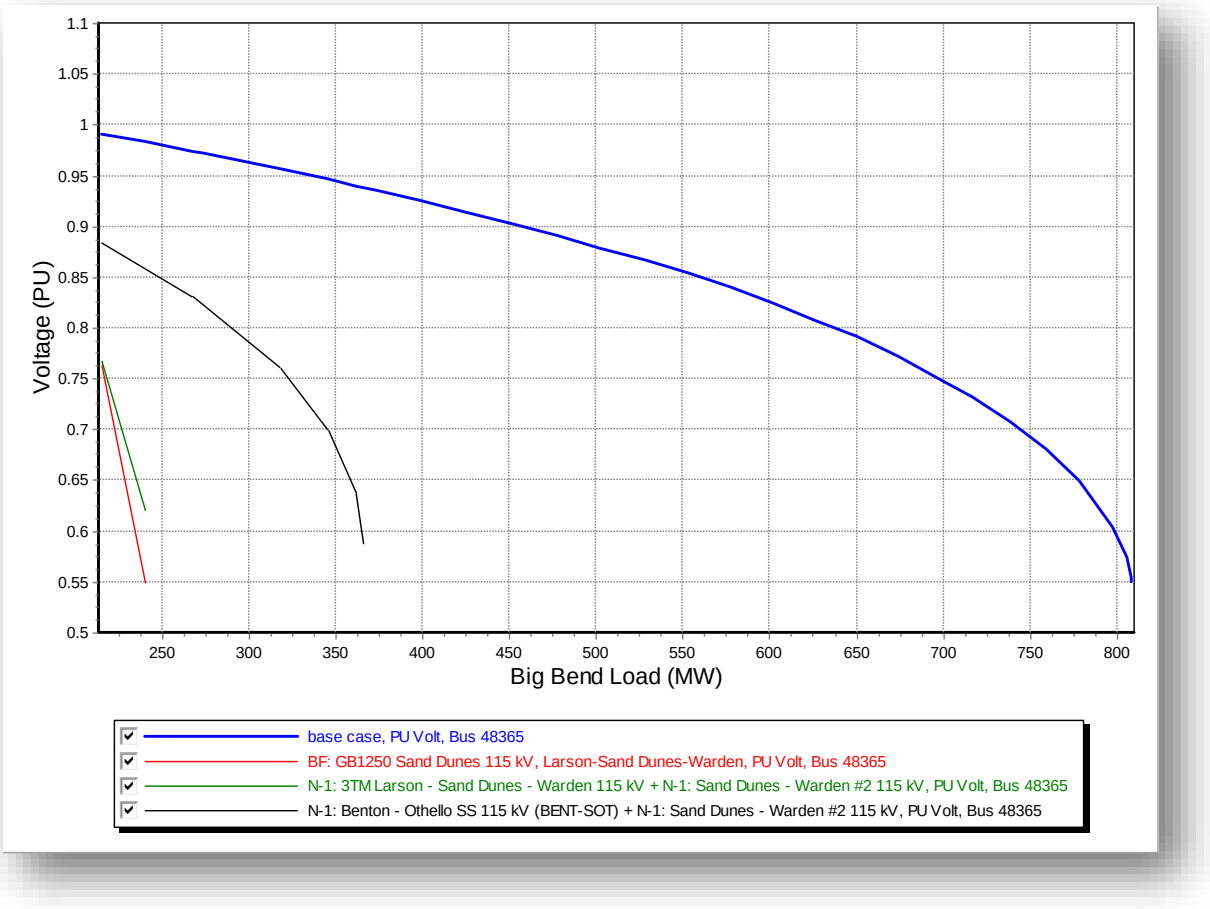


FIGURE III-3: BIG BEND LOAD RAMP PV CURVE RESULTS – EXISTING SYSTEM

The load ramp PV curve analysis was repeated with the assumption that all planned corrective action plans listed above are constructed. The limiting contingency remains the GB1250 breaker failure at Sand Dunes Station but with a total area load of 340 MW, an increase of 120 MW prior to project construction. The N-1-1 outage of Benton – Othello and Sand Dunes – Warden #2 115 kV transmission lines is more limiting with a total area load of around 300 MW but operator action can be taken in between the outages.

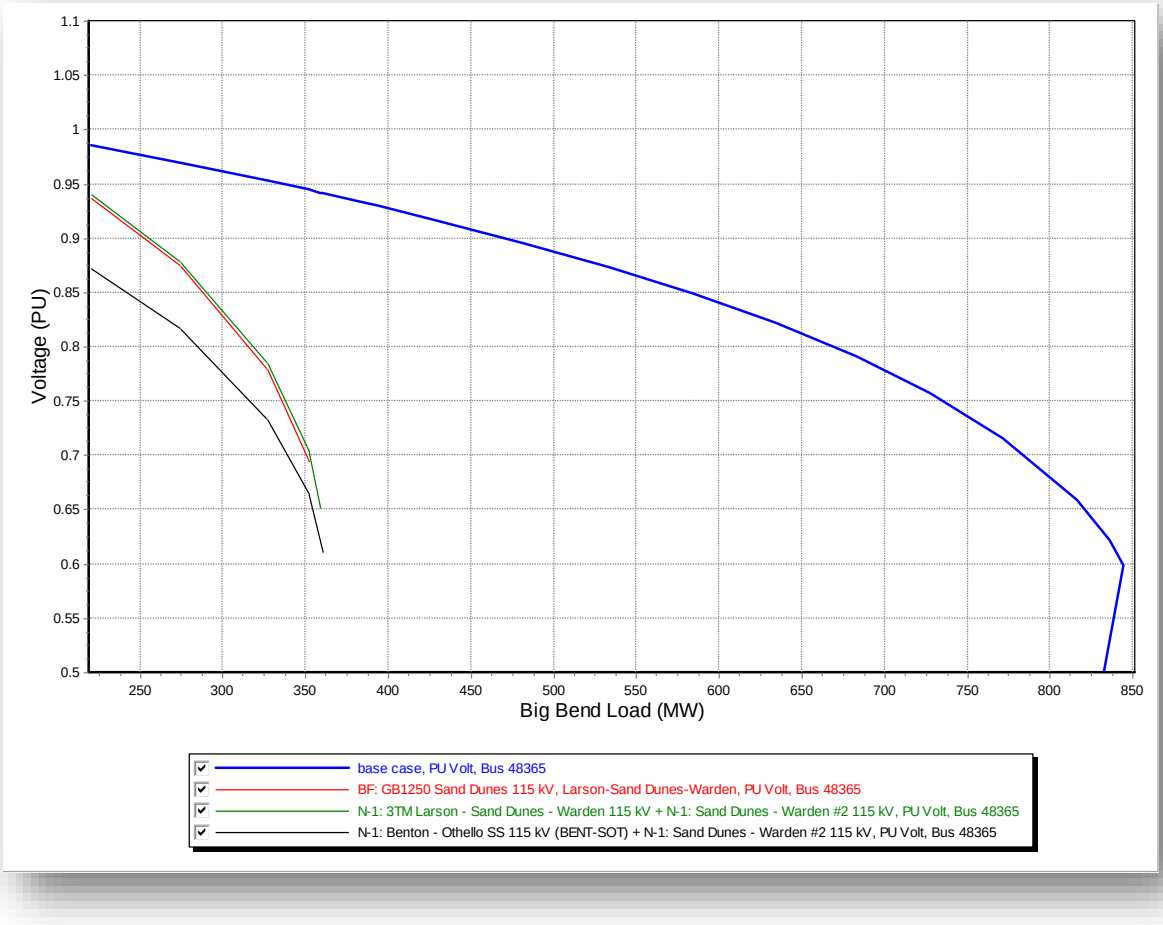


FIGURE III-4: BIG BEND LOAD RAMP PV CURVE RESULTS – PLANNED SYSTEM

3.7 Stability Study Results

Heavy Summer Scenario

Row Labels	16HS		20HSPROJECTS		25HSPROJECTS		
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	
P2							
BUS: Devils Gap East 115 kV 3P							
Out of Step Generator							
LITFAL12 4kV	OOS	1.3 s	OOS	1.3 s	OOS	1.3 s	Devil's Gap Reconfiguration
LITFAL34 4kV	OOS	1.3 s	OOS	1.3 s	OOS	1.3 s	
BUS: Devils Gap East 115 kV SLG							
Out of Step Generator							
LITFAL12 4kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s	
LITFAL34 4kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s	
P4							
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @ADD)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
LITFAL34 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @DGP)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
LITFAL34 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @ADD)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
LITFAL34 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @DGP)							Devil's Gap Reconfiguration
Out of Step Generator							
LITFAL12 4kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s	
LITFAL34 4kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s	
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV 3P (DGP-LL #1 @DGP)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.3 s	OOS	1.3 s	OOS	1.3 s	
LITFAL34 4kV	OOS	1.3 s	OOS	1.3 s	OOS	1.3 s	
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV SLG (DGP-LL #1 @DGP)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s	
LITFAL34 4kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s	
BF: A524 Devils Gap 115 kV, Devils Gap - Little Falls #1 115 kV 3P (DGP-LF #1 @DGP)							
Out of Step Generator							
LONGLKG1 4kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s	

Row Labels	16HS Max of Voltage Dip or Frequency	16HS Max of Duration or Time	20HSPROJECTS Max of Voltage Dip or Frequency	20HSPROJECTS Max of Duration or Time	25HSPROJECTS Max of Voltage Dip or Frequency	25HSPROJECTS Max of Duration or Time
LONGLKG2 4kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s
LONGLKG3 4kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s
LONGLKG4 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @DGP)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
LITFAL34 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @NMS)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s
LITFAL34 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @DGP)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s
LITFAL34 4kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @NMS)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s
LITFAL34 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @AIR)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s
LITFAL34 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @DGP)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
LITFAL34 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @AIR)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s
LITFAL34 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @DGP)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s
LITFAL34 4kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s
BF: A538 Devils Gap 115 kV, Devils Gap - Little Falls #2 115 kV 3P (DGP-LF #2 @DGP)						
Out of Step Generator						
LONGLKG1 4kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s
LONGLKG2 4kV	OOS	1.4 s	OOS	1.4 s	OOS	1.5 s

Row Labels	16HS		20HSPROJECTS		25HSPROJECTS		
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	
LONGLKG3 4kV	OOS	1.5 s	OOS	1.4 s	OOS	1.4 s	
LONGLKG4 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV 3P (DGP-LL #2 @DGP)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.3 s	OOS	1.3 s	OOS	1.3 s	
LITFAL34 4kV	OOS	1.3 s	OOS	1.3 s	OOS	1.3 s	
BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV SLG (DGP-LL #2 @DGP)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s	
LITFAL34 4kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s	
P5							
PSF: Devils Gap East 115 kV SLG							
Out of Step Generator							
LITFAL12 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
LITFAL34 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
PSF: Devils Gap West 115 kV 3P							Devil's Gap Reconfiguration
Out of Step Generator							
LONGLKG1 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
LONGLKG2 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
LONGLKG3 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
LONGLKG4 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	

Heavy Summer Low Hydro Scenario

Row Labels	16HSLH		20HSLHPROJECTS		25HSLHPROJECTS		
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	
P1							
N-1: Addy - Kettle Falls 115 kV 3P @ ADD							
Out of Step Generator							
KETTLEAV 14kV	OOS	1.6 s	OOS	1.6 s	OOS	1.6 s	Addy - Kettle Falls POTT Scheme
WECC Category B Frequency							
KETTLEAV 13.8kV	59.2 Hz	7.0 ~	59.2 Hz	7.0 ~			
WECC Category B Voltage Dip Load Bus							
COOK M T 115kV	-27.2 %		-27.5 %		-27.5 %		
KETTLEAV 115kV	-26.7 %		-26.9 %		-26.9 %		

Row Labels	16HSLH		20HSLHPROJECTS		25HSLHPROJECTS	
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time
KETTLEAV 13.8kV	-63.0 %		-63.2 %		-63.4 %	
REPUBLIC 115kV	-27.3 %		-27.6 %		-27.6 %	
WECC Category B Voltage Dip Load Bus Duration						
KETTLEAV 13.8kV	-63.0 %	INF	-63.2 %	INF	-63.4 %	INF

Heavy Winter Scenario

Row Labels	16HW		25HWPROJECTS		20HWPROJECTS		
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	
P1							
N-1: Addy - Kettle Falls 115 kV 3P @ ADD							
Out of Step Generator							
KETTLEAV 14kV	OOS	1.6 s	OOS	1.7 s	OOS	1.6 s	
WECC Category B Frequency							
KETTLEAV 13.8kV	59.2 Hz	8.5 ~	59.3 Hz	9.0 ~	59.1 Hz	8.5 ~	Addy - Kettle Falls POTT Scheme
WECC Category B Voltage Dip Load Bus							
COOK M T 115kV	-29.1 %		-28.0 %		-29.3 %		
KETTLEAV 115kV	-27.8 %		-26.8 %		-28.0 %		
KETTLEAV 13.8kV	-66.9 %		-64.7 %		-67.4 %		
REPUBLIC 115kV	-29.2 %		-28.2 %		-29.5 %		
WECC Category B Voltage Dip Load Bus Duration							
KETTLEAV 13.8kV	-66.9 %	INF	-64.7 %	INF	-67.4 %	INF	
P2							
BUS: Devils Gap East 115 kV 3P							
Out of Step Generator							
LITFAL12 4kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s	Devil's Gap Reconfiguration
LITFAL34 4kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s	
BUS: Devils Gap East 115 kV SLG							
Out of Step Generator							
LITFAL12 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
LITFAL34 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
P4							
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @ADD)							Devil's Gap Reconfiguration
Out of Step Generator							

Row Labels	16HW Max of Voltage Dip or Frequency	16HW Max of Duration or Time	25HWPROJECTS Max of Voltage Dip or Frequency	25HWPROJECTS Max of Duration or Time	20HWPROJECTS Max of Voltage Dip or Frequency	20HWPROJECTS Max of Duration or Time
LITFAL12 4kV	OOS	2.0 s	OOS	2.0 s	OOS	2.0 s
LITFAL34 4kV	OOS	2.0 s	OOS	2.0 s	OOS	2.0 s
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @DGP)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
LITFAL34 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @ADD)						
Out of Step Generator						
LITFAL12 4kV	OOS	2.0 s	OOS	2.0 s	OOS	2.0 s
LITFAL34 4kV	OOS	2.0 s	OOS	2.0 s	OOS	2.0 s
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @DGP)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.6 s	OOS	1.7 s	OOS	1.7 s
LITFAL34 4kV	OOS	1.6 s	OOS	1.7 s	OOS	1.7 s
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV 3P (DGP-LL #1 @DGP)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.3 s	OOS	1.3 s	OOS	1.3 s
LITFAL34 4kV	OOS	1.3 s	OOS	1.3 s	OOS	1.3 s
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV SLG (DGP-LL #1 @DGP)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.6 s	OOS	1.7 s	OOS	1.7 s
LITFAL34 4kV	OOS	1.6 s	OOS	1.7 s	OOS	1.7 s
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @DGP)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
LITFAL34 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @NMS)						
Out of Step Generator						
LITFAL12 4kV	OOS	2.1 s	OOS	2.1 s	OOS	2.1 s
LITFAL34 4kV	OOS	2.1 s	OOS	2.1 s	OOS	2.1 s
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @DGP)						
Out of Step Generator						
LITFAL12 4kV	OOS	1.7 s	OOS	1.7 s	OOS	1.7 s
LITFAL34 4kV	OOS	1.7 s	OOS	1.7 s	OOS	1.7 s
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @NMS)						
Out of Step Generator						
LITFAL12 4kV	OOS	2.0 s	OOS	2.1 s	OOS	2.0 s
LITFAL34 4kV	OOS	2.0 s	OOS	2.1 s	OOS	2.0 s
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @AIR)						

Row Labels	16HW Max of Voltage Dip or Frequency	16HW Max of Duration or Time	25HWPROJECTS Max of Voltage Dip or Frequency	25HWPROJECTS Max of Duration or Time	20HWPROJECTS Max of Voltage Dip or Frequency	20HWPROJECTS Max of Duration or Time	
Out of Step Generator							
LITFAL12 4kV	OOS	2.0 s	OOS	2.0 s	OOS	2.0 s	
LITFAL34 4kV	OOS	2.0 s	OOS	2.0 s	OOS	2.0 s	
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @DGP)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
LITFAL34 4kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @AIR)							
Out of Step Generator							
LITFAL12 4kV	OOS	2.0 s	OOS	2.0 s	OOS	2.0 s	
LITFAL34 4kV	OOS	2.0 s	OOS	2.0 s	OOS	2.0 s	
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @DGP)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.6 s	OOS	1.7 s	OOS	1.7 s	
LITFAL34 4kV	OOS	1.7 s	OOS	1.7 s	OOS	1.7 s	
BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV 3P (DGP-LL #2 @DGP)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.3 s	OOS	1.3 s	OOS	1.3 s	
LITFAL34 4kV	OOS	1.3 s	OOS	1.3 s	OOS	1.3 s	
BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV SLG (DGP-LL #2 @DGP)							
Out of Step Generator							
LITFAL12 4kV	OOS	1.6 s	OOS	1.7 s	OOS	1.7 s	
LITFAL34 4kV	OOS	1.6 s	OOS	1.7 s	OOS	1.7 s	
P5							
PSF: Devils Gap East 115 kV SLG							Devil's Gap Reconfiguration
Out of Step Generator							
LITFAL12 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
LITFAL34 4kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	

Light Scenarios

Row Labels	16LS Max of Voltage Dip or Frequency	16LS Max of Duration or Time	16LW Max of Voltage Dip or Frequency	16LW Max of Duration or Time	20LSPROJECTS Max of Voltage Dip or Frequency	20LSPROJECTS Max of Duration or Time	20LWPROJECTS Max of Voltage Dip or Frequency	20LWPROJECTS Max of Duration or Time	
P1									Addy -

Row Labels	16LS		16LW		20LSPROJECTS		20LWPROJECTS		
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	
N-1: Addy - Kettle Falls 115 kV 3P @ ADD									Kettle Falls POTT Scheme
Out of Step Generator									
KETTLEAV 14kV	OOS	1.7 s	OOS	1.7 s	OOS	1.7 s	OOS	1.7 s	
WECC Category B Frequency									
KETTLEAV 13.8kV	59.3 Hz	8.5 ~	59.3 Hz	8.5 ~	59.3 Hz	8.5 ~	59.3 Hz	8.5 ~	
WECC Category B Voltage Dip Load Bus									
COOK M T 115kV	-25.8 %		-26.2 %		-25.8 %		-26.3 %		
KETTLEAV 115kV	-25.8 %		-25.6 %		-25.8 %		-25.6 %		
KETTLEAV 13.8kV	-62.0 %		-61.9 %		-62.0 %		-61.8 %		
REPUBLIC 115kV	-25.8 %		-26.3 %		-25.8 %		-26.4 %		
WECC Category B Voltage Dip Load Bus Duration									
KETTLEAV 13.8kV	-62.0 %	INF	-61.9 %	INF	-62.0 %	INF	-61.8 %	INF	
P2									
BUS: Devils Gap East 115 kV 3P									
Out of Step Generator									
LITFAL12 4kV			OOS	1.3 s			OOS	1.3 s	Devil's Gap Reconfiguration
LITFAL34 4kV			OOS	1.3 s			OOS	1.3 s	
BUS: Devils Gap East 115 kV SLG									
Out of Step Generator									
LITFAL12 4kV			OOS	1.4 s			OOS	1.4 s	
LITFAL34 4kV			OOS	1.4 s			OOS	1.4 s	
P4									
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @ADD)									
Out of Step Generator									
LITFAL12 4kV			OOS	1.9 s			OOS	1.9 s	
LITFAL34 4kV			OOS	1.9 s			OOS	1.9 s	
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @DGP)									
Out of Step Generator									
LITFAL12 4kV			OOS	1.5 s			OOS	1.5 s	Devil's Gap Reconfiguration
LITFAL34 4kV			OOS	1.5 s			OOS	1.5 s	
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @ADD)									
Out of Step Generator									
LITFAL12 4kV			OOS	1.9 s			OOS	1.9 s	
LITFAL34 4kV			OOS	1.9 s			OOS	1.9 s	
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @DGP)									
Out of Step Generator									
LITFAL12 4kV			OOS	1.6 s			OOS	1.6 s	
LITFAL34 4kV			OOS	1.6 s			OOS	1.6 s	

Row Labels	16LS Max of Voltage Dip or Frequency	16LS Max of Duration or Time	16LW Max of Voltage Dip or Frequency	16LW Max of Duration or Time	20LSPROJECTS Max of Voltage Dip or Frequency	20LWPROJECTS Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV 3P (DGP-LL #1 @DGP)								
Out of Step Generator								
LITFAL12 4kV			OOS	**1.3 s**		OOS	**1.3 s**	
LITFAL34 4kV			OOS	**1.3 s**		OOS	**1.3 s**	
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV SLG (DGP-LL #1 @DGP)								
Out of Step Generator								
LITFAL12 4kV			OOS	**1.6 s**		OOS	**1.6 s**	
LITFAL34 4kV			OOS	**1.6 s**		OOS	**1.6 s**	
BF: A524 Devils Gap 115 kV, Devils Gap - Little Falls #1 115 kV 3P (DGP-LF #1 @DGP)								
Out of Step Generator								
LONGLKG1 4kV			OOS	**1.4 s**		OOS	**1.4 s**	
LONGLKG2 4kV			OOS	**1.4 s**		OOS	**1.4 s**	
LONGLKG3 4kV			OOS	**1.4 s**		OOS	**1.4 s**	
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @DGP)								
Out of Step Generator								
LITFAL12 4kV			OOS	**1.5 s**		OOS	**1.5 s**	
LITFAL34 4kV			OOS	**1.5 s**		OOS	**1.5 s**	
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @NMS)								
Out of Step Generator								
LITFAL12 4kV			OOS	**2.0 s**		OOS	**2.0 s**	
LITFAL34 4kV			OOS	**2.0 s**		OOS	**2.0 s**	
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @DGP)								
Out of Step Generator								
LITFAL12 4kV			OOS	**1.6 s**		OOS	**1.6 s**	
LITFAL34 4kV			OOS	**1.6 s**		OOS	**1.6 s**	
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @NMS)								
Out of Step Generator								
LITFAL12 4kV			OOS	**1.9 s**		OOS	**1.9 s**	
LITFAL34 4kV			OOS	**1.9 s**		OOS	**1.9 s**	
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @AIR)								
Out of Step Generator								
LITFAL12 4kV			OOS	**1.9 s**		OOS	**1.9 s**	
LITFAL34 4kV			OOS	**1.9 s**		OOS	**1.9 s**	
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @DGP)								
Out of Step Generator								
LITFAL12 4kV			OOS	**1.5 s**		OOS	**1.5 s**	
LITFAL34 4kV			OOS	**1.5 s**		OOS	**1.5 s**	
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @AIR)								

Row Labels	16LS Max of Voltage Dip or Frequency	16LS Max of Duration or Time	16LW Max of Voltage Dip or Frequency	16LW Max of Duration or Time	20LSPROJECTS Max of Voltage Dip or Frequency	20LWPROJECTS Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	
Out of Step Generator									
LITFAL12 4kV			OOS	1.9 s			OOS	1.9 s	
LITFAL34 4kV			OOS	1.9 s			OOS	1.9 s	
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @DGP)									
Out of Step Generator									
LITFAL12 4kV			OOS	1.6 s			OOS	1.6 s	
LITFAL34 4kV			OOS	1.6 s			OOS	1.6 s	
BF: A538 Devils Gap 115 kV, Devils Gap - Little Falls #2 115 kV 3P (DGP-LF #2 @DGP)									
Out of Step Generator									
LONGLKG1 4kV			OOS	1.4 s			OOS	1.4 s	
LONGLKG2 4kV			OOS	1.4 s			OOS	1.4 s	
LONGLKG3 4kV			OOS	1.5 s			OOS	1.5 s	
BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV 3P (DGP-LL #2 @DGP)									
Out of Step Generator									
LITFAL12 4kV			OOS	1.3 s			OOS	1.3 s	
LITFAL34 4kV			OOS	1.3 s			OOS	1.3 s	
BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV SLG (DGP-LL #2 @DGP)									
Out of Step Generator									
LITFAL12 4kV			OOS	1.6 s			OOS	1.6 s	
LITFAL34 4kV			OOS	1.6 s			OOS	1.6 s	
P5									
PSF: Devils Gap East 115 kV 3P									
Out of Step Generator									
LITFAL12 4kV			OOS	1.9 s			OOS	1.9 s	
LITFAL34 4kV			OOS	1.9 s			OOS	1.9 s	
PSF: Devils Gap East 115 kV SLG									Devil's Gap Reconfiguration
Out of Step Generator									
LITFAL12 4kV			OOS	1.9 s			OOS	1.9 s	
LITFAL34 4kV			OOS	1.9 s			OOS	1.9 s	
PSF: Devils Gap West 115 kV 3P									
Out of Step Generator									
LONGLKG1 4kV			OOS	1.5 s			OOS	1.5 s	
LONGLKG2 4kV			OOS	1.5 s			OOS	1.5 s	
LONGLKG3 4kV			OOS	1.5 s			OOS	1.5 s	

4 COEUR D'ALENE AREA

4.1 Executive Summary

The Coeur d'Alene area transmission system demonstrated performance issues in the near term and long term planning horizons. Several performance issues exist in the present state of the system and worsen with time. The most severe performance issue in the Coeur d'Alene area is caused by the tie breaker failure of A624 at Rathdrum Station. The area's dependence on the Rathdrum Station leaves the system with a single point of failure causing localized area outages.

Completion of the Coeur d'Alene – Pine Creek 115 kV Transmission Line Rebuild project and Cabinet – Bronx – Sand Creek 115 kV Transmission Line Rebuild project will provide greatly improved transmission system performance in the near and long term planning horizon. Replacement of several aging facilities will also contribute to improved reliability. The Noxon Station Rebuild project is the most prominent project in the area.

A list of the corrective action plans proposed for the Coeur d'Alene area is provided in Table III-7.

	Year Problem Starts	Construction Start	Construction End	Consequence	Risk Factor	Priority	Cost Estimate
1-Completed							
Lancaster Interconnection						0.0100	
2-Planned							
Cabinet – Bronx – Sand Creek 115 kV Transmission Line Rebuild	Present	2015	2017	205	0.3750	76.8750	$7,500,000
Coeur d'Alene – Pine Creek 115 kV Transmission Line Rebuild	Present	2016	2018	1204	0.0750	90.3000	$12,750,000
Pine Creek Transformer Replacement	2034			5	0.0005	0.0100	$500,000
3-Needs Further Analysis							
St. Maries Cap Bank	Present			50	0.0625	3.1250	$500,000
4-Conceptual							
Cabinet 230/115 kV Transformer Automatic LTC	2019			82	0.0025	0.2050	$50,000
Rathdrum 115 kV Bus Reconfiguration	2034			344	0.0038	1.2900	$5,000,000
Sandpoint Reinforcement	Present			1740	0.0094	16.3125	$20,000,000

TABLE III-7: COEUR D'ALENE CORRECTIVE ACTION PLANS

Additional projects not categorized as corrective action plans are listed in Table III-8.

	Construction Start	Construction End	Cost Estimate
1-Completed			
Blue Creek Station Rebuild			
Julia Street			
Noxon Construction Station			
2-Planned			
Beck Road Station	2015	2014	
Big Creek Station Rebuild	2016	2017	$1,300,000
Burke - Pine Creek #3 & #4 115 kV Transmission Line Rebuild	2015	2015	$3,500,000
Cabinet - Noxon 230 kV Transmission Line Rebuild	2017	2018	$1,500,000
Noxon Rapids 230 kV Switchyard Rebuild	2015	2019	$21,075,000
Priest River Station			
Sandpoint, Sagle, and Oden Grid Modernization			
St. Maries SCADA Upgrade/Add Feeder	2018	2018	$750,000
Benewah - Pine Creek 230 kV Transmission Line Rebuild	2018	2019	$15,000,000
3-Needs Further Analysis			

	Construction Start	Construction End	Cost Estimate
Bronx Station	2019	2019	$1,500,000
Cabinet Gorge Switching Station			
Carlin Bay Station			
Noxon - Pine Creek #2 230 kV Transmission Line			

TABLE III-8: COEUR D'ALENE FURTHER SINGLE SYSTEM PROJECTS

4.2 System Description

The Avista Coeur d'Alene area is located primarily in Kootenai, Benewah, Bonner, and Shoshone counties in the state of Idaho and Sanders County in the state of Montana. The geographic features, and therefore the characterization of the transmission system, vary greatly throughout the Coeur d'Alene area. The cities of Coeur d'Alene, Post Falls, and Sandpoint contain the majority of the area's load, and the remaining load can be categorized as rural and low density. The transmission system consists of several major elements: a 500 kV source at the BPA's Hot Springs Station, a 230 kV backbone system which provides energy transfer capacity from local hydro generation resources as well as sources to the area, and the underlying 115 kV transmission system which serve the local loads.

The 115 kV transmission system in the Coeur d'Alene area is primarily operated in a networked configuration. Other areas of Avista's Transmission System operate with normally open points referred to as "star points". A star point is used to minimize power flow to mitigate overloads on the 115 kV transmission system in the event of an outage on the overlying 230 kV transmission system, as well as reducing overall system losses in the area. Operating in a "star" configuration also reduces exposure to loads served by long transmission lines. In the Coeur d'Alene area, star point switches can be operated open or closed based on outages, specific flow conditions, or due to operational constraints.

This year a new configuration was implemented by operations engineering to add another "source" into the Coeur d'Alene area's load center and mitigate potential violations for certain N-1-1 outages. The new setup consists of the Boulder – Rathdrum 115 kV and Post Falls – Ramsey 115 kV lines be reconfigured as the Boulder – Post Falls 115 kV and Ramsey – Rathdrum No. 3 115 kV Lines. For more details of this project refer to SOP 36 Rathdrum Area 115 Operations. This setup is modeled in the non-project basecases and the assumption taken is once the Coeur d'Alene – Pine Creek 115 kV Line Rebuild project is complete the original configuration will be implemented. A Rathdrum area Long Term Study will be complete in 2016 to decide which configuration is superior in the future.

4.2.1 Area Transmission

Transmission Lines

The main 230 kV transmission lines in the Coeur d'Alene area are:

- Benewah – Pine Creek
- Cabinet – Noxon
- Cabinet – Rathdrum
- Hot – Springs Noxon #1 (BPA) and #2 (AVA)
- Libby – Noxon (BPA)
- Noxon – Pine Creek

Transmission Sources

The main transmission sources that feed the load in the Coeur d'Alene area are:

- 230/115 kV, 125 MVA transformer at Cabinet Gorge
- (2) 230/115 kV, 125 MVA transformer at Pine Creek
- (2) 230/115 kV, 250 MVA transformer at Rathdrum
- 230/115 kV, 150 MVA transformer at Libby (BPA)

Transmission Paths

The Western Electricity Coordinating Council (WECC) transfer path Montana to Northwest (Path 8) borders the eastern edge of the Coeur d'Alene area. Avista owns the following transmission facilities within the path

- Burke – Thompson Falls A & B 115 kV

4.2.2 Area Generation

Non-Avista owned local generation facilities within the Coeur d'Alene area include the following:

Albeni Falls HED	Unit 1 – 3 @ 16 MW each	Army Corps of Engineers
Lancaster CCCT	Units 1 & 2 @ 290 MW total, Winter 249 MW total, Summer	Rathdrum Operating Services Co., Inc.
Plummer	Unit 1 @ 5 MW	Stimson Lumber Company

There are no active Generation Interconnection Requests within the Coeur d'Alene area (as of October 2015).

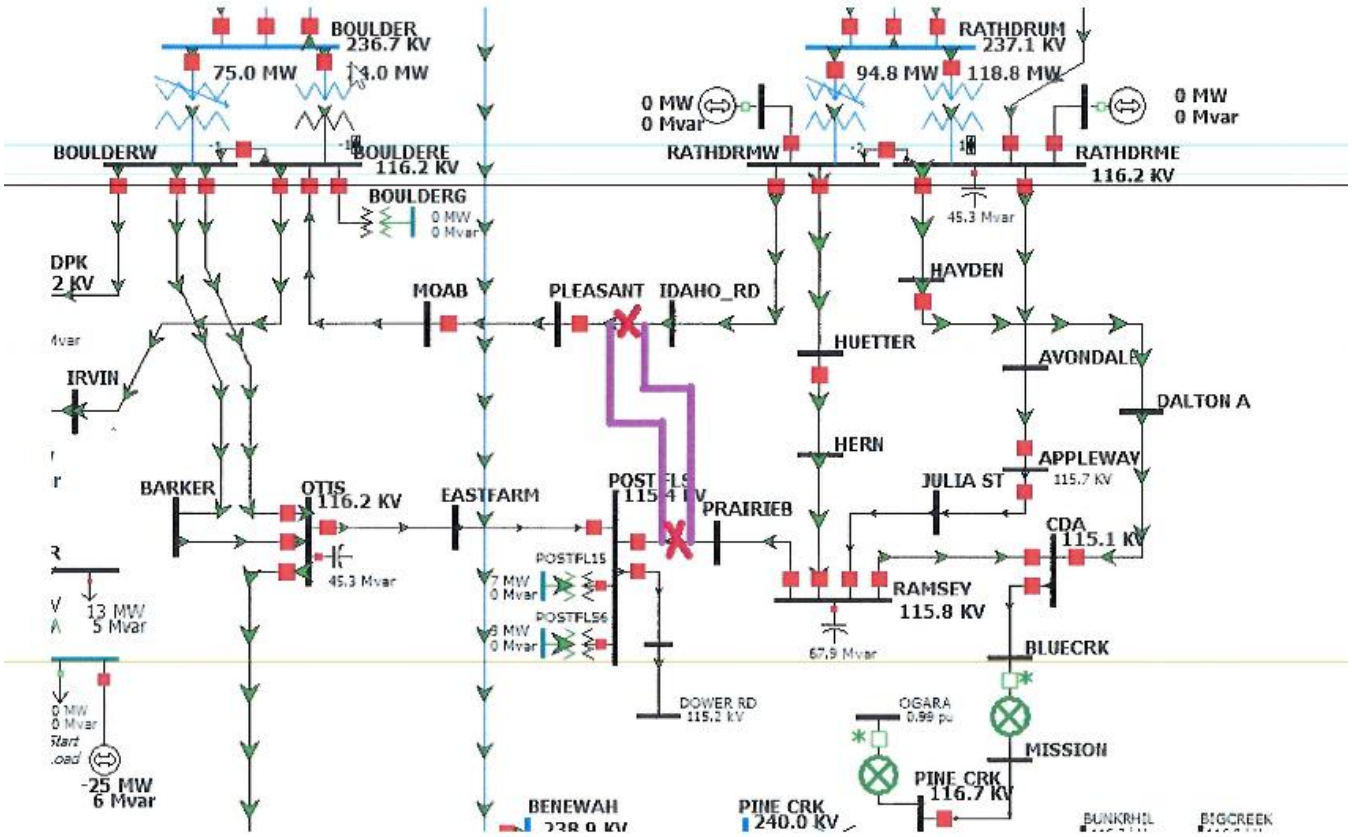
4.3 Corrective Action Plans

4.3.1 Completed

Coeur d'Alene Area Reconfiguration Project

The Boulder –Rathdrum and Post Falls – Ramsey 115 kV transmission lines were reconfigured to create the Boulder – Post Falls and Ramsey – Rathdrum #3 115 kV transmission lines. The transmission line reconfiguration was driven by an operational concern from N-1-1 outages.

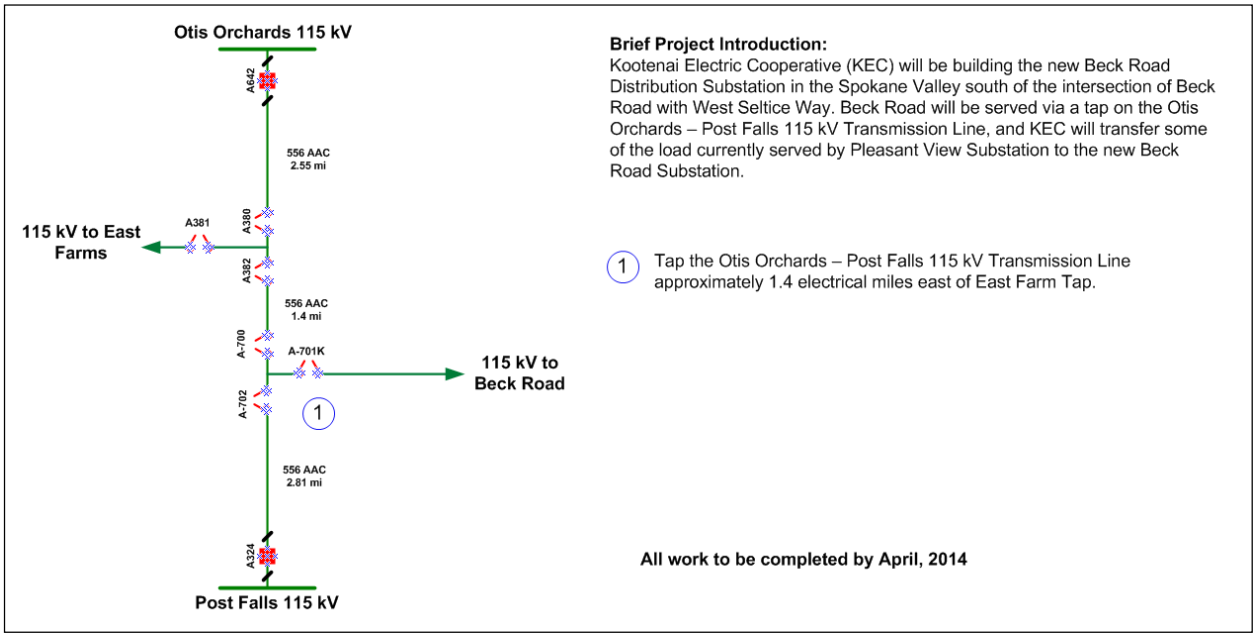
Construction was completed in spring of 2015.



Beck Road Station

The BPA entered into a Network Integration Transmission Service System Impact and Facilities Study Agreement with Avista. Avista and BPA are parties to the Network Integration Transmission Service Agreement (NITSA) for service to the loads of Kootenai Electric Cooperative, Inc. under Avista's Open Access Transmission Tariff. BPA is requesting a new Point of Delivery (POD) under the NITSA for service to a proposed Beck Road Station located 1.4 miles east of Avista's East Farms 115 kV Tap in the Spokane Valley. The BPA has given a projected initial operating date of April 1, 2014. The System Impact and Facilities Study

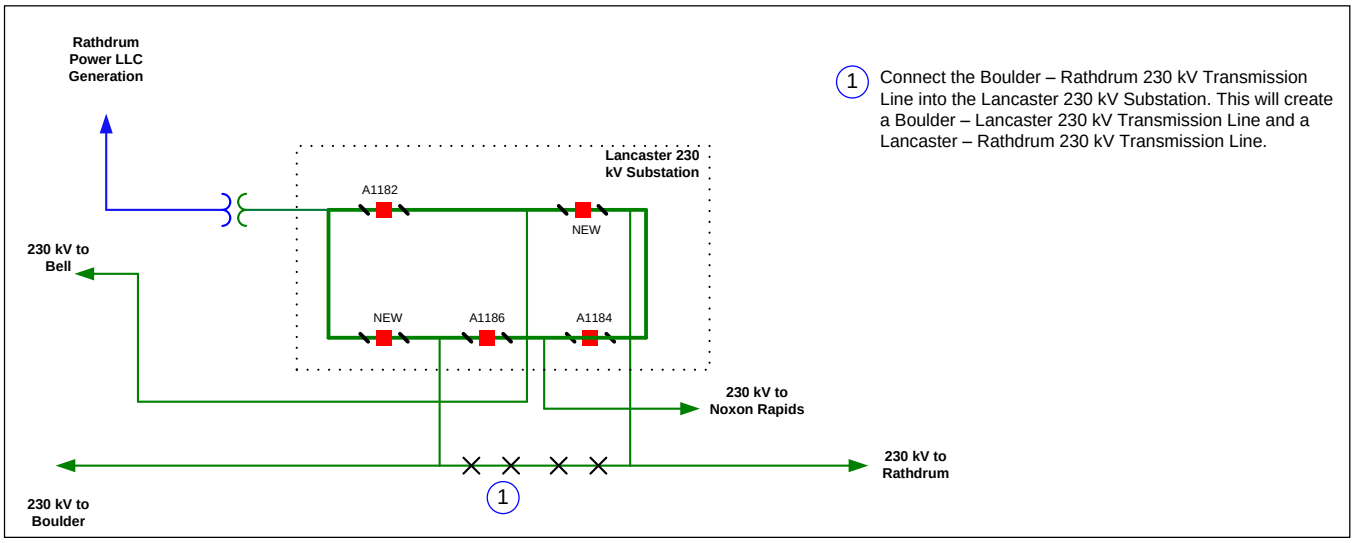
Agreement requests that Avista study the project with the POD 1.4 electrical miles east of the East Farms Tap on the Otis Orchards – Post Falls 115 kV Transmission Line. The study work indicated that the 115 kV interconnection configuration performed adequately and has no adverse impacts on the local Transmission System.



Lancaster Interconnection Project

The Boulder – Rathdrum 230 kV Transmission Line was looped into the existing Lancaster Station. Significant Transmission System performance improvements are gained by the completion of the project. The project included the addition of two new terminal positions at the Lancaster Station making it a five position ring bus.

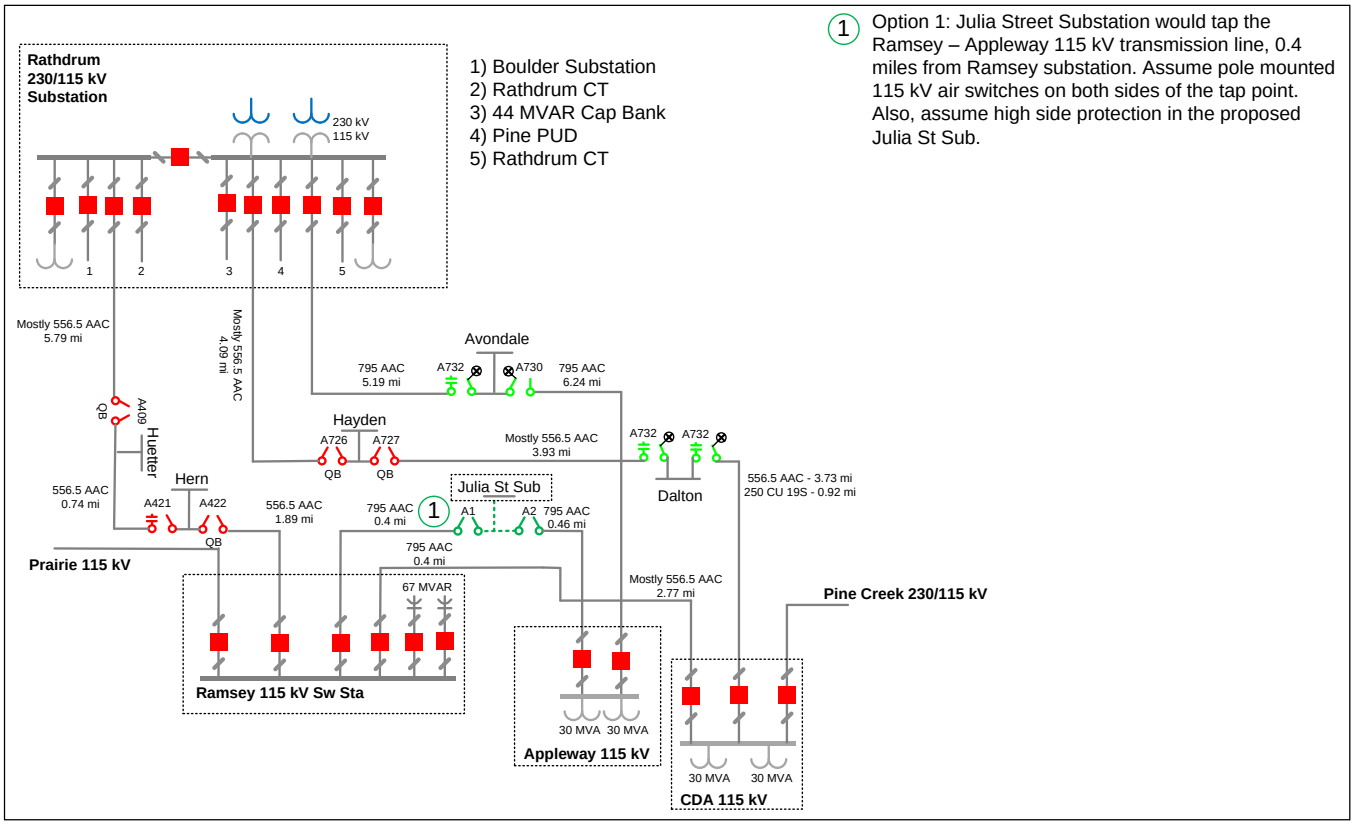
Construction was completed in 2013.



Julia Street Station

Kootenai Electric Cooperative constructed a new distribution station, Julia St., integrated into the Appleway – Ramsey 115 kV Transmission Line.

Construction was completed in 2013.



Noxon Construction Station Rebuild

The Noxon Construction Station 230/13 kV transformer and some of the associated distribution facilities have been replaced.

Construction was completed in 2013.

Blue Creek Station Rebuild

The Blue Creek Station rebuild is presently under construction. A rebuild of the station was necessary to accommodate the replacement of the 20 MVA distribution transformer. as well as transmission switching and associated communications infrastructure additions. The station is being built as a green field substation adjacent to the existing station.

Pine Creek Transformer Replacement

The existing Pine Creek 230/115 kV #1 Autotransformer consists of a nominal 125 MVA, 230/115 kV transformer and a 115/115 kV voltage regulating transformer. The Substation Engineering Group has identified the need to replace these devices with a single 125 MVA autotransformer. The new transformer will be specified to match the Avista's present standard configuration. Thermal overload of the transformer was observed with the outage of the Benewah – Pine Creek 230 kV Transmission Line and Pine Creek #2 230/115 kV Transformer following the completion of the Coeur d'Alene – Pine Creek 115 kV Transmission Line Rebuild project.

The N-1-1 outage of the Benewah – Pine Creek 230 kV Transmission Line and the Pine Creek #2 230/115 kV Transformer causes an overload of the Pine Creek #1 230/115 kV Transformer in the 2034 heavy summer scenario. The planned project to rebuild the Coeur d'Alene – Pine Creek 115 kV Transmission Line and operating it normally closed contributes significantly to the issue. Replacement of the Pine Creek #1 230/115 kV Transformer has been identified by Substation Engineering. The replacement transformer will have sufficient thermal capacity in the twenty year planning horizon with a nominal rating of125 MVA.

4.3.2 Planned

Cabinet – Bronx – Sand Creek 115 kV Transmission Line Rebuild

Project Scope/Description

The Bronx – Cabinet & Bronx – Sand Creek 115 kV Transmission Line Reconductor project includes reconductoring the transmission lines from the Cabinet Gorge Station to the end of Avista's ownership between the Sandpoint and Sand Creek stations. The new conductor will be capable of providing a minimum of 205 MVA thermal capacity at 40C ambient temperature. The reconductor of the two transmission lines mitigates thermal overloads on the transmission lines for the loss of the Bonneville Power Administration's Libby 230/115 kV Transformer and other contingencies in the area.

Status of the project is almost complete, 33 miles from Cabinet Gorge to Bronx Substations were reconductored recently, and 7 miles remain between Bronx and Sandpoint Substations.

Completion of the project will mitigate the performance issues within the ten year planning horizon.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 Heavy Winter.

The project is scheduled to be completed by the end of 2017.

Performance Criteria Violations

Heavy Summer Assessment Results

Row Labels	16HS	20HS	25HS	35HS	35HSPROJECTS
P1					
T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			100.1 %	105.8 %	
P2					
BF: B1337 Sand Creek 115 kV, Albeni Falls-Sand Creek					
BRONX (48047)	06.4 %	05.7 %	06.6 %	07.1 %	05.7 %
ODEN (48293)	05.3 %		05.5 %	05.9 %	05.0 %
SANDPT A (48377)	07.2 %	06.4 %	07.3 %	0.9444	06.3 %
BF: B1338 Sand Creek 115 kV, Albeni Falls-Bonners Ferry					
BRONX (48047)	06.4 %	05.8 %	06.6 %	07.1 %	05.8 %
ODEN (48293)	05.2 %		05.6 %	06.0 %	05.1 %
SANDPT A (48377)	07.1 %	06.5 %	0.9492	0.9435	06.3 %
BUS: Sand Creek 115 kV					
BRONX (48047)	06.4 %	05.7 %	06.5 %	07.0 %	05.7 %
ODEN (48293)	05.3 %		05.5 %	05.9 %	
SANDPT A (48377)	07.2 %	06.4 %	07.3 %	0.9446	06.2 %
N-1: Bonner Ferry - Libby 115 kV Open @ LIB					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.0 %	105.6 %	
N-1: Bronx - Sand Creek 115 kV Open @ SCR					
BRONX (48047)	06.3 %	05.6 %	06.5 %	06.9 %	05.6 %
ODEN (48293)	05.1 %		05.4 %	05.8 %	
SANDPT A (48377)	07.0 %	06.3 %	07.2 %	0.9456	06.2 %
P3					
G-1: Albeni Falls Units 1-3 + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1				100.1 %	

Row Labels	16HS	20HS	25HS	35HS	35HSPROJECTS
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.5 %	102.7 %	108.5 %	
G-1: Lancaster Thermal Units 1&2 + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.0 %		
P6					
N-1: 3TM Bell - Boundary #1 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1				100.4 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		100.7 %	105.3 %	108.9 %	
ODEN (48293) -> BRONX (48047) CKT 1				100.1 %	
N-1: Albeni Falls - Sacheen 115 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1				103.6 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		104.2 %	105.6 %	112.1 %	
ODEN (48293) -> BRONX (48047) CKT 1				103.4 %	
N-1: Albeni Falls - Sand Creek 115 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1		123.1 %	124.1 %	127.0 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		131.0 %	132.4 %	136.2 %	
ODEN (48293) -> BRONX (48047) CKT 1		122.6 %	123.6 %	126.5 %	
N-1: Beacon - Rathdrum 230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		100.2 %	101.4 %	106.9 %	
N-1: Bell - Coulee #6 500 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.3 %		
N-1: Bell - Taft 500 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.6 %	102.8 %	108.4 %	
N-1: Benewah - Moscow 230 230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		100.1 %	101.3 %	106.9 %	
N-1: Benewah - Pine Creek 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1		101.8 %	105.9 %	107.9 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		109.6 %	113.8 %	116.5 %	
ODEN (48293) -> BRONX (48047) CKT 1		101.5 %	105.6 %	107.6 %	
N-1: Boulder - Lancaster 230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.2 %	102.4 %	108.0 %	
N-1: Boundary - Usk 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1				100.8 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		102.6 %	106.6 %	109.4 %	
ODEN (48293) -> BRONX (48047) CKT 1				100.5 %	
N-1: Cabinet - Rathdrum 230 kV + N-1: Bonners Ferry - Libby 115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1		107.2 %	108.0 %	114.0 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		115.0 %	116.2 %	122.5 %	
ODEN (48293) -> BRONX (48047) CKT 1		106.9 %	107.7 %	113.6 %	
N-1: Cabinet - Rathdrum 230 kV + N-1: Bonners Ferry - Sand Creek 115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1	100.6 %	100.8 %	104.9 %	108.1 %	
N-1: Cabinet - Rathdrum 230 kV + N-1: Hot Springs - Taft 500 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			101.9 %	103.7 %	
N-1: Cabinet - Rathdrum 230 kV + T-1: Hot Springs 500/230 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			101.9 %	103.7 %	
N-1: Cabinet - Rathdrum 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1	107.5 %	126.7 %	130.8 %	133.3 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1	115.0 %	134.7 %	138.8 %	142.1 %	
ODEN (48293) -> BRONX (48047) CKT 1	107.2 %	126.2 %	130.3 %	132.8 %	
N-1: Columbia Falls - Flathead 230 kV + N-1: Libby - Noxon 230 kV					
BRONX (48047) -> ODEN (48293) CKT 1	102.8 %				
ODEN (48293) -> CLRKFORK (48077) CKT 1	101.8 %				
SANDPT A (48377) -> BRONX (48047) CKT 1	103.9 %				
N-1: Columbia Falls - Flathead 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1			101.0 %	103.0 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		104.6 %	108.8 %	111.4 %	
ODEN (48293) -> BRONX (48047) CKT 1			100.8 %	102.7 %	
N-1: Conkelley - Libby 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1			102.8 %	104.8 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		106.5 %	110.7 %	113.3 %	
ODEN (48293) -> BRONX (48047) CKT 1			102.6 %	104.5 %	
N-1: Dworshak - Hatwai 500 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1			103.3 %	105.2 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		107.1 %	111.2 %	113.7 %	
ODEN (48293) -> BRONX (48047) CKT 1			103.0 %	104.9 %	
N-1: Dworshak - Taft 500 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1			103.5 %	105.4 %	

Row Labels	16HS	20HS	25HS	35HS	35HSPROJECTS
CLRKFORK (48077) -> ODEN (48293) CKT 1		107.3 %	111.4 %	113.9 %	
ODEN (48293) -> BRONX (48047) CKT 1			103.2 %	105.1 %	
N-1: Flathead - Hot Springs 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1				101.6 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		103.2 %	107.4 %	110.0 %	
ODEN (48293) -> BRONX (48047) CKT 1				101.3 %	
N-1: Hatwai - Lower Granite 500 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.9 %	102.9 %		
N-1: Hot Springs - Noxon #1 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1			100.8 %	102.6 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		104.5 %	108.6 %	111.1 %	
ODEN (48293) -> BRONX (48047) CKT 1			100.5 %	102.3 %	
N-1: Hot Springs - Noxon #2 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1			100.7 %	102.5 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		104.4 %	108.5 %	111.0 %	
ODEN (48293) -> BRONX (48047) CKT 1			100.4 %	102.2 %	
N-1: Hot Springs - Rattle Snake 230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		100.2 %	101.3 %	107.0 %	
N-1: Hot Springs - Taft 500 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1			103.6 %	105.2 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		107.4 %	111.4 %	113.7 %	
ODEN (48293) -> BRONX (48047) CKT 1			103.3 %	104.9 %	
N-1: Lancaster - Noxon 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1		101.3 %	105.6 %	107.8 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		109.1 %	113.4 %	116.3 %	
ODEN (48293) -> BRONX (48047) CKT 1		101.0 %	105.3 %	107.4 %	
N-1: Lancaster - Rathdrum 230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.4 %		
N-1: Noxon - Pine Creek 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1		103.5 %	107.6 %	109.7 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		111.3 %	115.5 %	118.2 %	
ODEN (48293) -> BRONX (48047) CKT 1		103.1 %	107.3 %	109.3 %	
N-1: Pine Street - Usk 115 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1				105.2 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		106.9 %	108.2 %	113.8 %	
ODEN (48293) -> BRONX (48047) CKT 1				104.9 %	
N-1: Rathdrum #1 230/115 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.0 %	105.3 %	108.1 %	
N-1: Rathdrum #2 230/115 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1				101.1 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		102.3 %	106.6 %	109.6 %	
ODEN (48293) -> BRONX (48047) CKT 1				100.8 %	
S-1: Airway Heights 115kV Switched Shunt + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.2 %		
S-1: Bell 230kV Switched Shunt + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.2 %		
S-1: Otis Orchards 115kV Switched Shunt + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.3 %		
S-1: Rathdrum 115kV Switched Shunt + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.4 %		
S-1: Sunset 115kV Switched Shunt + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.3 %		
S-1: Third & Hatch 115kV Switched Shunt + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.3 %		
S-1: Trentwood 115kV Switched Shunt + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			103.2 %		
T-1: Bell #1 500/230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1				100.9 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		100.4 %	102.2 %	109.4 %	
ODEN (48293) -> BRONX (48047) CKT 1				100.7 %	
T-1: Hatwai 500/230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			101.8 %		
T-1: Hot Springs 500/230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1			103.6 %	105.2 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		107.4 %	111.4 %	113.7 %	
ODEN (48293) -> BRONX (48047) CKT 1			103.3 %	104.9 %	

Heavy Winter Assessment Results

Row Labels	16HW	20HW	25HW	35HW	35HWPR OJECTS
P1					
T-1: Libby 230/115 kV					
BRONX (48047)				05.2 %	
SANDPT A (48377)		05.4 %	05.5 %	05.9 %	
P2					
BF: B1337 Sand Creek 115 kV, Albeni Falls-Sand Creek					
BRONX (48047)	05.7 %	05.8 %	05.9 %	05.9 %	
ODEN (48293)			05.1 %	05.1 %	
SANDPT A (48377)	06.3 %	06.4 %	06.5 %	0.9463	05.4 %
BF: B1338 Sand Creek 115 kV, Albeni Falls-Bonners Ferry					
BRONX (48047)	05.8 %	05.8 %	05.9 %	06.0 %	05.0 %
ODEN (48293)	05.0 %	05.0 %	05.1 %	05.2 %	
SANDPT A (48377)	06.4 %	06.4 %	0.9495	0.9456	05.5 %
BF: B960 Albeni Falls 115 kV, Albeni Falls-Sacheen					
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.0 %	102.9 %	105.4 %	
BF: B964 Albeni Falls 115 kV, Albeni Falls-Pine Street					
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.0 %	102.9 %	105.4 %	
BUS: Albeni Falls 115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.0 %	102.9 %	105.3 %	
BUS: Sand Creek 115 kV					
BRONX (48047)	05.7 %	05.8 %	05.9 %	06.0 %	
ODEN (48293)			05.1 %	05.2 %	
SANDPT A (48377)	06.3 %	06.4 %	0.9499	0.946	05.5 %
N-1: Albeni Falls - Sand Creek 115 kV Open @ ALB					
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.1 %	103.0 %	105.4 %	
N-1: Bonner Ferry - Libby 115 kV Open @ LIB					
BRONX (48047)			05.1 %	05.4 %	
SANDPT A (48377)		05.6 %	05.7 %	06.0 %	
N-1: Bronx - Sand Creek 115 kV Open @ SCR					
BRONX (48047)	05.6 %	05.7 %	05.8 %	05.8 %	
ODEN (48293)				05.0 %	
SANDPT A (48377)	06.2 %	06.3 %	06.4 %	0.9475	05.3 %
P3					
G-1: Albeni Falls Units 1-3 + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1				101.0 %	
P6					
N-1: 3TM Bell - Boundary #1 230 kV + N-1: Albeni Falls - Pine Street 115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.4 %	103.6 %	106.6 %	
N-1: 3TM Bell - Boundary #1 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1		100.1 %	102.9 %	106.6 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1	103.1 %	108.3 %	111.4 %	115.8 %	
ODEN (48293) -> BRONX (48047) CKT 1			102.7 %	106.4 %	
N-1: Albeni Falls - Pine Street 115 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			100.1 %	103.1 %	
N-1: Albeni Falls - Pine Street 115 kV + T-1: Sacheen 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		101.4 %	103.7 %	106.6 %	
N-1: Albeni Falls - Sacheen 115 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1			101.3 %	104.6 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1	102.0 %	107.0 %	109.9 %	113.8 %	
ODEN (48293) -> BRONX (48047) CKT 1			101.2 %	104.5 %	
N-1: Albeni Falls - Sand Creek 115 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1	182.5 %	188.9 %	190.3 %	193.2 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1	191.8 %	198.7 %	200.5 %	204.3 %	
ODEN (48293) -> BRONX (48047) CKT 1	182.0 %	188.4 %	189.8 %	192.7 %	
SANDPT A (48377) -> SANSAN11 (90111) CKT 1	107.6 %	111.1 %	110.6 %	109.9 %	
N-1: Bell - Taft 500 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1	100.3 %	101.6 %	104.6 %	108.2 %	
N-1: Benewah - Pine Creek 230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1				102.0 %	
N-1: Boundary - Usk 230 kV + T-1: Libby 230/115 kV					

Row Labels	16HW	20HW	25HW	35HW	35HWPROJECTS
CLRKFORK (48077) -> ODEN (48293) CKT 1				101.8 %	
N-1: Cabinet - Rathdrum 230 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1			101.7 %	104.5 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1	105.9 %	107.0 %	110.1 %	113.6 %	
ODEN (48293) -> BRONX (48047) CKT 1			101.6 %	104.4 %	
N-1: Conkelley - Libby 230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1				102.1 %	
N-1: Lancaster - Noxon 230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1				102.8 %	
N-1: Noxon - Pine Creek 230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1			100.6 %	103.7 %	
N-1: Pine Street - Usk 115 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1				100.5 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1	101.2 %	103.3 %	106.0 %	109.6 %	
ODEN (48293) -> BRONX (48047) CKT 1				100.4 %	
N-1: Rathdrum #1 230/115 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1				100.7 %	
N-1: Rathdrum #2 230/115 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1				102.1 %	
S-1: Sand Creek 115kV Switched Shunt + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1				103.6 %	
T-1: Bell #1 500/230 kV + T-1: Libby 230/115 kV					
CLRKFORK (48077) -> ODEN (48293) CKT 1		100.3 %	103.5 %	107.8 %	

Heavy Summer Low Hydro Assessment Results

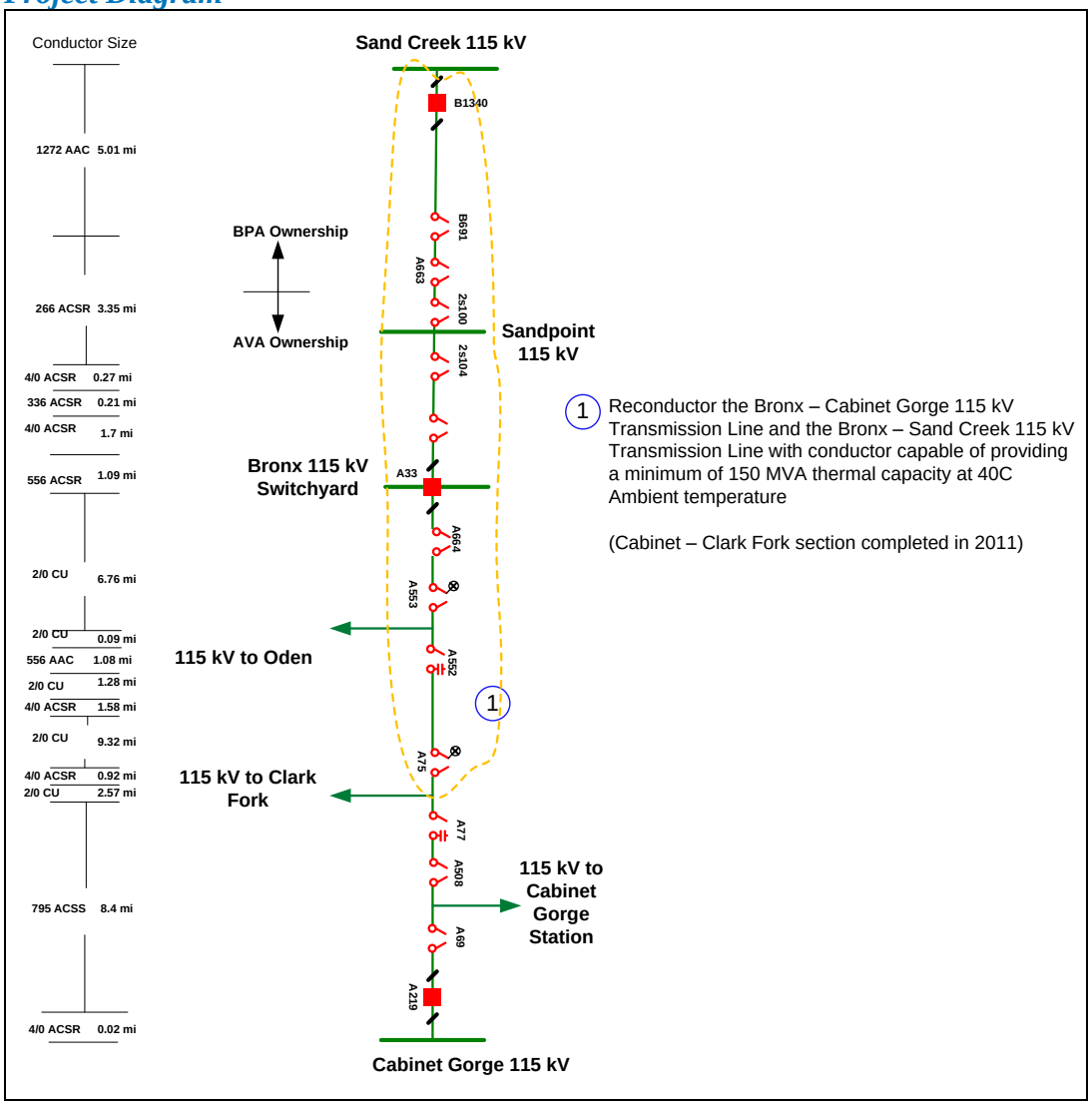
Row Labels	16HSLH	20HSLH	25HSLH	35HSLH	35HSPROJECTSLH
P2					
BF: B1337 Sand Creek 115 kV, Albeni Falls-Sand Creek					
BRONX (48047)	05.5 %	05.6 %	05.8 %	06.1 %	
SANDPT A (48377)	06.2 %	06.4 %	06.6 %	0.9494	05.4 %
BF: B1338 Sand Creek 115 kV, Albeni Falls-Bonners Ferry					
BRONX (48047)	05.4 %	05.8 %	06.0 %	06.2 %	05.0 %
ODEN (48293)				05.1 %	
SANDPT A (48377)	06.2 %	06.5 %	06.7 %	0.9481	05.5 %
BUS: Sand Creek 115 kV					
BRONX (48047)	05.5 %	05.6 %	05.8 %	06.1 %	
SANDPT A (48377)	06.2 %	06.3 %	06.5 %	0.9496	05.4 %
N-1: Bronx - Sand Creek 115 kV Open @ SCR					
BRONX (48047)	05.3 %	05.6 %	05.8 %	06.0 %	
SANDPT A (48377)	06.1 %	06.3 %	06.5 %	06.8 %	05.3 %
P6					
N-1: Albeni Falls - Sand Creek 115 kV + T-1: Libby 230/115 kV					
BRONX (48047) -> SANDPT A (48377) CKT 1		122.9 %	124.2 %	127.0 %	
CLRKFORK (48077) -> ODEN (48293) CKT 1		130.8 %	132.4 %	136.0 %	
ODEN (48293) -> BRONX (48047) CKT 1		122.5 %	123.7 %	126.4 %	
N-1: Columbia Falls - Flathead 230 kV + N-1: Libby - Noxon 230 kV					
BRONX (48047) -> ODEN (48293) CKT 1	107.6 %				
ODEN (48293) -> CLRKFORK (48077) CKT 1	104.4 %				
SANDPT A (48377) -> BRONX (48047) CKT 1	108.7 %				
SANSAN11 (90111) -> SANDPT A (48377) CKT 1	102.8 %				

Light Scenario Assessment Results

Row Labels	16LS	16LW	20LS	20LW
P2				
BF: B1337 Sand Creek 115 kV, Albeni Falls-Sand Creek				
SANDPT A (48377)	05.3 %	05.4 %	05.4 %	05.5 %
BF: B1338 Sand Creek 115 kV, Albeni Falls-Bonners Ferry				
BRONX (48047)		05.1 %		05.1 %
SANDPT A (48377)	05.0 %	05.6 %	05.1 %	05.6 %

BUS: Sand Creek 115 kV SANDPT A (48377) **N-1: Bronx - Sand Creek 115 kV Open @ SCR** SANDPT A (48377)	**05.2 %**	**05.4 %** **05.4 %**	**05.3 %**	**05.5 %** **05.4 %**

Project Diagram



Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- SP-2010-10 – Reconductor/Rebuild of Cabinet-Bronx-Sandcreek 115 kV line

Coeur d'Alene – Pine Creek 115 kV Transmission Line Rebuild

Project Scope/Description

Reconductoring the Coeur d'Alene 15th St – Pine Creek 115 kV Transmission Line to 795 ACSR conductor with minimum thermal capacity rating of 150 MVA at 40C and operating the transmission line normally closed has been identified as a mitigating project for several transmission performance issues in the area. Operating the transmission line normally closed provides an additional source into the Coeur d'Alene area. The additional source supports the remaining transmission system following bus outages at Rathdrum Station.

Rebuilding the transmission line also accommodates the installation of fiber optic shield wire allowing for communication aided protection schemes and the potential addition of SCADA to Blue Creek and Mission Stations.

In addition to this project a Rathdrum Area Long Term Study will be performed to evaluate the violations incurred once the temporary Coeur d'Alene Area Reconfiguration project is reset to normal configuration.

Completion of the project will mitigate the performance issues within the ten year planning horizon.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 Heavy Summer.

The project is scheduled to be completed by the end of 2018.

Performance Criteria Violations

Heavy Summer Assessment Results

Row Labels	16HS	20HS	25HS	35HS
P2				
BF: A506 Rathdrum 115 kV, Pine Street-Rathdrum				
BLUECRK (48045)	0.9406			0.9451
CDA (48067)	0.9418			0.9465
DALTON A (48093)	0.9353			0.9392
HAYDEN (48148)	0.9344			0.9382
AVONDALE (48019)	0.9481			05.1 %
RATHDRUM (48357) -> RATHDRMW (48355) CKT 1				105.2 %
HERN (48155) -> RAMSEY (48349) CKT 1				105.2 %
BF: A638 Rathdrum 115 kV, Appleway-Rathdrum				
BLUECRK (48045)	0.9464	0.945	0.9406	
CDA (48067)	0.9477	0.9462	0.942	
DALTON A (48093)	0.9412	0.9397	0.9351	0.9464
HAYDEN (48148)	0.9403	0.9388	0.9342	0.9455
BUS: Rathdrum East 115 kV				
BLUECRK (48045)	0.9407			0.9451
CDA (48067)	0.942			0.9465
DALTON A (48093)	0.9355			0.9391
HAYDEN (48148)	0.9346			0.9382
AVONDALE (48019)	0.9482			05.1 %
RATHDRUM (48357) -> RATHDRMW (48355) CKT 1				105.2 %
HERN (48155) -> RAMSEY (48349) CKT 1				105.2 %
P5				

Row Labels	16HS	20HS	25HS	35HS
PSF: Ramsey 115 kV				
IDAHO_RD (48161) -> PRAIRIEB (40855) CKT 1	101.2 %	104.7 %	109.1 %	117.5 %
RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1	110.3 %	114.1 %	119.0 %	128.3 %
PSF: Rathdrum West 115 kV				
HERN (48155)				0.948
HUETTER (48159)				0.9481
RATHBUS1 (48351)				05.9 %
RATHDRMW (48355)				05.9 %
P6				
N-1: Albeni Falls - Pine Street 115 kV + N-1: Rathdrum #2 230/115 kV				
RATHDRUM (48357) -> RATHDRMW (48355) CKT 1				101.3 %
N-1: Pine Street - Rathdrum 115 kV (PNST-HOO) + N-1: Rathdrum #2 230/115 kV				
RATHDRUM (48357) -> RATHDRMW (48355) CKT 1	107.6 %	104.9 %	109.3 %	118.3 %
N-1: Pine Street - Rathdrum 115 kV (RAT-SPL) + N-1: Rathdrum #2 230/115 kV				
RATHDRUM (48357) -> RATHDRMW (48355) CKT 1				103.9 %
N-1: Rathdrum #1 230/115 kV + N-1: Rathdrum #2 230/115 kV				
ATHOL (40067)	0.4391			
BLANCHRD (48043)	0.6884			
BLUECRK (48045)	0.3071			
BRONX (48047)	0.9404			
CDA (48067)	0.3087			
DALTON A (48093)	0.3111			
HERN (48155)	0.3163			
HOODOO (47505)	0.5794			
HUETTER (48159)	0.3173			
NEWPORTT (48258)	0.8028			
OLDTOWN (48298)	0.8026			
PRAIRIEB (40855)	0.3136			
PRIEST A (48347)	0.8455			
RATHBUS1 (48351)	0.3282			
RATHDRMW (48355)	0.3282			
SANDPT A (48377)	0.9319			
BLANCHRD (48043) -> HOODOO (47505) CKT 1	273.8 %			
HOODOO (47505) -> SPIRITLT (48403) CKT 1	271.4 %			
NEWPORTT (48258) -> BLANCHRD (48043) CKT 1	274.6 %			
PINE ST (47086) -> NEWPORTT (48258) CKT 1	286.8 %			
SPIRITLT (48403) -> ATHOLTAP (48017) CKT 1	268.2 %			
APPLEWAY (48013)	0.3137			
JULIA ST (48170)	0.3139			
RAMSEY (48349)	0.314			
HAYDEN (48148)	0.3186			
IDAHO_RD (48161)	0.3197			
AVONDALE (48019)	0.3205			
RATHBUS2 (48353)	0.3283			
RATHDRME (48356)	0.3283			
SCARCELO (40953)	0.3849			
ATHOLTAP (48017)	0.4517			
SPIRITLK (48401)	0.48			
SPIRITLT (48403)	0.4803			
ATHOLTAP (48017) -> SCARCELO (40953) CKT 1	238.0 %			
SCARCELO (40953) -> RATHDRME (48356) CKT 1	230.8 %			

Heavy Winter Assessment Results

Row Labels	16HW	25HW	35HW
P2			
BF: A506 Rathdrum 115 kV, Pine Street-Rathdrum			
DALTON A (48093)			0.9486
HAYDEN (48148)			0.9478
BUS: Rathdrum East 115 kV			
DALTON A (48093)			0.9476

Row Labels	16HW	25HW	35HW
HAYDEN (48148)			0.9468
P6			
N-1: Beacon - Rathdrum 230 kV + N-1: Boulder - Lancaster 230 kV			
RATHDRUM (48357)	1.0528		1.0524
N-1: Rathdrum #1 230/115 kV + N-1: Rathdrum #2 230/115 kV			
ATHOL (40067)		0.3876	0.3723
BARE MT (47096)		0.8412	0.8354
BLANCHRD (48043)		0.6326	0.6231
BLUECRK (48045)		0.2632	0.2433
BRONX (48047)		0.8924	0.887
CDA (48067)		0.265	0.2451
DALTON A (48093)		0.2673	0.2475
HERN (48155)		0.2711	0.2513
HOODOO (47505)		0.5219	0.5102
HUETTER (48159)		0.2718	0.2521
NEWPORTT (48258)		0.7495	0.742
ODEN (48293)		0.9167	0.9122
OLDTOWN (48298)		0.7491	0.7415
PRAIRIEB (40855)		0.2686	0.2489
PRIEST A (48347)		0.7896	0.7824
RATHBUS1 (48351)		0.2798	0.2604
RATHDRMW (48355)		0.2798	0.2604
SANDPT A (48377)		0.8776	0.8715
BLANCHRD (48043) -> HOODOO (47505) CKT 1		188.3 %	189.5 %
HOODOO (47505) -> SPIRITLT (48403) CKT 1		184.3 %	185.3 %
NEWPORTT (48258) -> BLANCHRD (48043) CKT 1		189.3 %	190.6 %
PINE ST (47086) -> NEWPORTT (48258) CKT 1		199.8 %	201.4 %
SPIRITLT (48403) -> ATHOLTAP (48017) CKT 1		178.0 %	178.7 %
APPLEWAY (48013)		0.2691	0.2492
JULIA ST (48170)		0.2692	0.2493
RAMSEY (48349)		0.2693	0.2494
HAYDEN (48148)		0.2726	0.253
IDAHO_RD (48161)		0.2734	0.2537
AVONDALE (48019)		0.274	0.2544
RATHBUS2 (48353)		0.2799	0.2604
RATHDRME (48356)		0.2799	0.2604
SCARCELO (40953)		0.3297	0.3124
ATHOLTAP (48017)		0.395	0.3799
SPIRITLK (48401)		0.4216	0.4073
SPIRITLT (48403)		0.4226	0.4084
ATHOLTAP (48017) -> SCARCELO (40953) CKT 1		164.7 %	165.2 %
SCARCELO (40953) -> RATHDRME (48356) CKT 1		156.4 %	156.9 %
P7			
N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV			
RATHDRUM (48357)	1.0528		1.0524
N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV			
BLUECRK (48045)			0.9496

Heavy Summer Low Hydro Assessment Results

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
P2				
BF: A506 Rathdrum 115 kV, Pine Street-Rathdrum				
DALTON A (48093)				0.9455
HAYDEN (48148)			05.1 %	0.9446
HERN (48155) -> RAMSEY (48349) CKT 1				104.4 %
BF: A638 Rathdrum 115 kV, Appleway-Rathdrum				
HAYDEN (48148)				05.3 %
BUS: Rathdrum East 115 kV				
DALTON A (48093)				0.9453
HAYDEN (48148)			05.1 %	0.9444
HERN (48155) -> RAMSEY (48349) CKT 1				104.5 %
P5				
PSF: Ramsey 115 kV				
IDAHO_RD (48161) -> PRAIRIEB (40855) CKT 1	100.0 %	103.9 %	107.8 %	117.4 %

RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1	109.0 %	113.2 %	117.6 %	128.2 %

Light Scenario Assessment Results

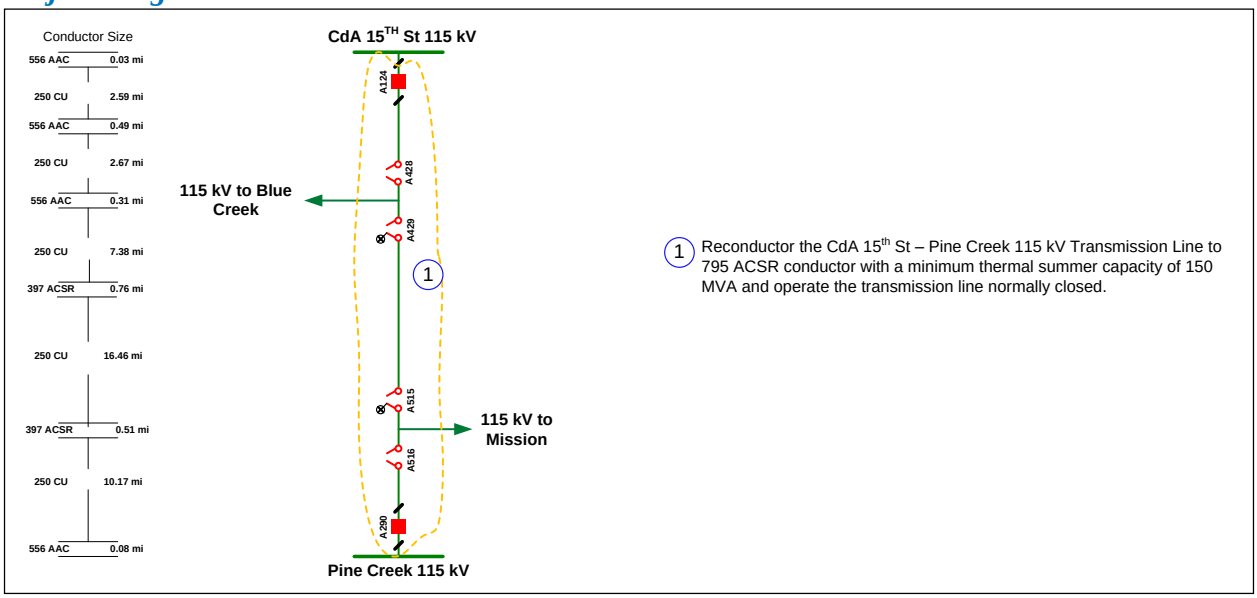
Row Labels	16LS	20LS
P6		
N-1: Rathdrum #1 230/115 kV + N-1: Rathdrum #2 230/115 kV		
BLANCHRD (48043) -> HOODOO (47505) CKT 1	104.8 %	107.9 %
HOODOO (47505) -> SPIRITLT (48403) CKT 1	103.9 %	106.9 %
NEWPORTT (48258) -> BLANCHRD (48043) CKT 1	105.2 %	108.2 %
PINE ST (47086) -> NEWPORTT (48258) CKT 1	110.5 %	113.8 %
SPIRITLT (48403) -> ATHOLTAP (48017) CKT 1	102.7 %	105.7 %

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Coeur d'Alene Reinforcement Feasibility Study

Project Diagram



4.3.3 Need Further Analysis

The following sections describe system deficiencies assuming completion of the planned projects as described above.

Sandpoint Reinforcement

Project Scope/Description

The outage of both the Libby and Cabinet transformers will cause low voltage violations in the heavy scenarios. The remaining source to the local area is the Albeni Falls – Sand Creek 115 kV Transmission Line which is incapable of providing sufficient reactive power support even with the presence of shunt capacitors at Sand Creek, Bonners Ferry, and Sand Point stations. A reinforcement project needs to be developed to mitigate the observed low voltages. The project may include the construction of a new 115 kV transmission line to Sand Point Station from Rathdrum or Albeni Falls stations.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 Heavy Scenarios.

Performance Criteria Violations

Heavy Summer Assessment Results

Row Labels	16HS	35HSPROJECTS	20HSPROJECTS	25HSPROJECTS
P6				
N-1: Coeur d'Alene 15th St - Ramsey 115 kV + N-1: Coeur d'Alene 15th St - Rathdrum 115 kV				
CDA (48067)		0.9478		
N-1: Columbia Falls - Flathead 230 kV + N-1: Libby - Noxon 230 kV				
BRONX (48047)	0.8587	0.8645	0.8761	0.8672
CAB GORG (48057)		0.9497		
CABINETG (48065)	0.9495	0.9484		0.9494
CLRKFORK (48077)	0.9245	0.9227	0.9291	0.9241
ODEN (48293)	0.876	0.8807	0.8909	0.8831
PRIEST A (48347)	0.9356	0.9382	0.9442	0.9385
SANDPT A (48377)	0.8462	0.8525	0.8652	0.8555
N-1: Lancaster - Rathdrum 230 kV + N-1: Coeur d'Alene 15th St - Ramsey 115 kV				
BLUECRK (48045)	0.9472			
CDA (48067)	0.9484			
N-1: Lancaster - Rathdrum 230 kV + S-1: Rathdrum 115kV Switched Shunt				
BLUECRK (48045)	0.9491			

Heavy Winter Assessment Results

Row Labels	16HW	35HWPROJECTS	20HWPROJECTS	25HWPROJECTS
P6				
N-1: 3TM Bell - Boundary #1 230 kV + T-1: Libby 230/115 kV				
SANDPT A (48377)	0.945			
N-1: Albeni Falls - Sand Creek 115 kV + T-1: Libby 230/115 kV				
BRONX (48047)	0.6735	0.7723	0.7857	0.7887
CAB GORG (48057)	0.9081	0.9192	0.9246	0.9251
CABINETG (48065)	0.9054	0.9168	0.9224	0.9228
CLRKFORK (48077)	0.8504	0.8679	0.8764	0.8775
ODEN (48293)	0.7379	0.7965	0.8088	0.8111
SANDPT A (48377)	0.6337	0.756	0.7701	0.7736
N-1: Benewah - Pine Creek 230 kV + T-1: Moscow 230/115 kV				
GARFIELD (48133)			0.9496	
N-1: Bronx - Cabinet 115 kV + T-1: Libby 230/115 kV				
BARE MT (47096)		0.9388		
BLANCHRD (48043)		0.9345		0.9484
BRONX (48047)	0.918	0.7853	0.8636	0.8341

Row Labels	16HW	35HWPROJECTS	20HWPROJECTS	25HWPROJECTS
HOODOO (47505)		0.9462		
NEWPORTT (48258)		0.923		0.9391
OLDTOWN (48298)		0.9226		0.9388
PRIEST A (48347)		0.8871	0.9269	0.9104
SANDPT A (48377)	0.9179	0.7852	0.8635	0.8341
S-1: Sand Creek 115kV Switched Shunt + T-1: Cabinet Gorge 230/115 kV				
BRONX (48047)		0.9454		
CAB GORG (48057)		0.9418		0.9499
CABINETG (48065)		0.9418		0.9499
CLRKFORK (48077)		0.9425		
ODEN (48293)		0.9443		
SANDPT A (48377)		0.9461		
S-1: Sand Creek 115kV Switched Shunt + T-1: Libby 230/115 kV				
BRONX (48047)	0.9248	0.9265	0.9359	0.9308
ODEN (48293)	0.9441	0.9344	0.9428	0.9383
SANDPT A (48377)	0.9134	0.921	0.931	0.9256
T-1: Cabinet Gorge 230/115 kV + T-1: Libby 230/115 kV				
ATHOL (40067)		0.9379		0.9452
BARE MT (47096)		0.9034	0.9239	0.9137
BLANCHRD (48043)	0.9345	0.8989	0.9191	0.9095
BRONX (48047)	0.7716	0.6434	0.7008	0.6776
CAB GORG (48057)	0.7614	0.6365	0.6955	0.6718
CABINETG (48065)	0.7614	0.6365	0.6955	0.6718
CLRKFORK (48077)	0.7621	0.6376	0.6963	0.6727
HOODOO (47505)	0.9458	0.9176	0.935	0.9267
NEWPORTT (48258)	0.9233	0.8804	0.9033	0.8925
ODEN (48293)	0.7659	0.6412	0.6991	0.6757
OLDTOWN (48298)	0.923	0.8801	0.9029	0.8922
PRIEST A (48347)	0.8851	0.8228	0.8535	0.8398
SANDPT A (48377)	0.775	0.6451	0.702	0.679
ATHOLTAP (48017)		0.9432		
SPIRITLK (48401)		0.9359		0.9435
SPIRITLT (48403)		0.9366		0.9442
T-1: Libby 230/115 kV + T-1: Sacheen 230/115 kV				
CAB GORG (48059) -> CAB GORG (48057) CKT 1		100.8 %		

Heavy Summer Low Hydro Assessment Results

Row Labels	16HSLH	20HSPROJECTSLH	25HSPROJECTSLH	35HSPROJECTSLH
P6				
N-1: Coeur d'Alene 15th St - Ramsey 115 kV + N-1: Coeur d'Alene 15th St - Rathdrum 115 kV				
CDA (48067)				0.9491
N-1: Columbia Falls - Flathead 230 kV + N-1: Libby - Noxon 230 kV				
BRONX (48047)	0.8852	0.8958	0.8942	0.8918
CLRKFORK (48077)	0.935	0.9391	0.938	0.9371
ODEN (48293)	0.8958	0.9077	0.9062	0.9042
PRIEST A (48347)	0.949			
SANDPT A (48377)	0.8773	0.887	0.8854	0.8827

Light Scenario Assessment Results

No potential violations identified

Project Diagram

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Sandpoint Reinforcement Transmission Plan

St. Maries Capacitor Bank

Project Scope/Description

Low voltage occurs at the St. Maries Station for several outages in the heavy summer and heavy winter scenarios. The ability to regulate voltage at Benewah Station is affected by outages related to Hatwai causing additional power flow on the 230 kV system. The heavy load at St. Maries Station leads to noteworthy voltage drop along the Benewah – Pine Creek 115 kV Transmission Line. The installation of a capacitor bank at St. Maries or Ogara station will mitigate the low voltage issue.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 Heavy Summer low hydro.

Performance Criteria Violations

Heavy Summer Low Hydro Assessment Results

Row Labels	16HSLH	20HSPROJECTSLH	25HSPROJECTSLH	35HSPROJECTSLH
P3				
G-1: Albeni Falls Units 1-3 + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9466	0.939
G-1: Cabinet Gorge Hydro Units 1-4 + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9466	0.9389
G-1: Hungry Horse Hydro Units 1-4 + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9474	0.9398
G-1: Kerr Units 1-3 + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9473	0.9397
G-1: Lancaster Thermal Units 1&2 + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9457	0.9373
G-1: Libby Hydro Units 1-5 + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9494	0.9417
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.948	0.9403
G-1: Post Falls Hydro Units 1-6 + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9463	0.9387
G-1: Rathdrum Thermal Units 1&2 + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9477	0.9399
G-1: Thompson Falls Hydro Units 1-7 + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9464	0.9388
T-1: Hatwai 500/230 kV + G-1: Albeni Falls Units 1-3				
STMARIES (48417)			0.9466	0.939
T-1: Hatwai 500/230 kV + G-1: Cabinet Gorge Hydro Units 1-4				
STMARIES (48417)			0.9466	0.9389
T-1: Hatwai 500/230 kV + G-1: Hungry Horse Hydro Units 1-4				
STMARIES (48417)			0.9474	0.9398
T-1: Hatwai 500/230 kV + G-1: Kerr Units 1-3				
STMARIES (48417)			0.9473	0.9397
T-1: Hatwai 500/230 kV + G-1: Lancaster Thermal Units 1&2				
STMARIES (48417)			0.9457	0.9373
T-1: Hatwai 500/230 kV + G-1: Libby Hydro Units 1-5				
STMARIES (48417)			0.9494	0.9417
T-1: Hatwai 500/230 kV + G-1: Noxon Rapids Hydro Units 1-5				
STMARIES (48417)			0.9481	0.9403
T-1: Hatwai 500/230 kV + G-1: Post Falls Hydro Units 1-6				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + G-1: Rathdrum Thermal Units 1&2				
STMARIES (48417)			0.9477	0.9399
T-1: Hatwai 500/230 kV + G-1: Thompson Falls Hydro Units 1-7				
STMARIES (48417)			0.9464	0.9388
P6				
N-1: 3TM Bell - Boundary #1 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9498	0.946	0.9382
N-1: 3TM Burke - Thompson Falls A 115 kV (BUR-TOM) + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9497	0.9459	0.9383
N-1: 3TM Burke - Thompson Falls A 115 kV (SALT-TAFA) + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9499	0.9461	0.9385
N-1: Albeni Falls - Pine Street 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9462	0.9386
N-1: Albeni Falls - Sacheen 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9463	0.9387
N-1: Albeni Falls - Sand Creek 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9495	0.9458	0.9382
N-1: Appleway - Ramsey 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9464	0.9389
N-1: Appleway - Rathdrum 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9498	0.9461	0.9384
N-1: Beacon - Rathdrum 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9495	0.9457	0.9381

Row Labels	16HSLH	20HSPROJECTSLH	25HSPROJECTSLH	35HSPROJECTSLH
N-1: Benewah - Pine Creek 230 kV + T-1: Hatwai 500/230 kV				
OGARA (48297)				0.9472
STMARIES (48417)	0.9482	0.9469	0.9425	0.9335
N-1: Bonners Ferry - Libby 115 kV + N-1: Dworshak - Hatwai 500 kV				
STMARIES (48417)				0.9494
N-1: Bonners Ferry - Libby 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9483	0.9444	0.9368
N-1: Bonners Ferry - Sand Creek 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9491	0.9452	0.9376
N-1: Boulder - Lancaster 230 kV + N-1: Dworshak - Hatwai 500 kV				
STMARIES (48417)				0.9479
N-1: Boulder - Lancaster 230 kV + N-1: Dworshak - Taft 500 kV				
STMARIES (48417)				0.9488
N-1: Boulder - Lancaster 230 kV + T-1: Hatwai 500/230 kV				
OGARA (48297)				0.9473
STMARIES (48417)	0.946	0.9462	0.9419	0.9335
N-1: Bronx - Cabinet 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9496	0.9458	0.9382
N-1: Bronx - Sand Creek 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9494	0.9455	0.9379
N-1: Burke - Pine Creek #3 115 kV (BUR-LKY) + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9497	0.9459	0.9382
N-1: Burke - Pine Creek #3 115 kV (PIN-LKY) + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9466	0.9389
N-1: Burke - Pine Creek #4 115 kV (BUR-BIG) + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9464	0.9387
N-1: Burke - Pine Creek #4 115 kV (PIN-BIG) + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9467	0.9391
N-1: Burke - Thompson Falls B 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9499	0.9462	0.9385
N-1: Cabinet - Noxon 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9492	0.9454	0.9377
N-1: Cabinet - Rathdrum 230 kV + N-1: Dworshak - Hatwai 500 kV				
STMARIES (48417)				0.9495
N-1: Cabinet - Rathdrum 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9485	0.9446	0.9369
N-1: Coeur d'Alene 15th St - Ramsey 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9496	0.9458	0.9382
N-1: Coeur d'Alene 15th St - Rathdrum 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9466	0.9392
N-1: Columbia Falls - Conkelley 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9499	0.9461	0.9385
N-1: Columbia Falls - Flathead 230 kV + N-1: Dworshak - Hatwai 500 kV				
STMARIES (48417)				0.9481
N-1: Columbia Falls - Flathead 230 kV + N-1: Dworshak - Taft 500 kV				
STMARIES (48417)				0.949
N-1: Columbia Falls - Flathead 230 kV + T-1: Hatwai 500/230 kV				
OGARA (48297)				0.9487
STMARIES (48417)	0.9487	0.9465	0.9426	0.935
N-1: Columbia Falls - Hungry Horse 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9462	0.9386
N-1: Columbia Falls - Kalispel 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9462	0.9386
N-1: Conkelley - Hungry Horse 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9462	0.9386
N-1: Conkelley - Libby 230 kV + N-1: Dworshak - Hatwai 500 kV				
STMARIES (48417)				0.9472
N-1: Conkelley - Libby 230 kV + N-1: Dworshak - Taft 500 kV				
STMARIES (48417)				0.9481
N-1: Conkelley - Libby 230 kV + T-1: Hatwai 500/230 kV				
OGARA (48297)				0.9474
STMARIES (48417)	0.9471	0.9453	0.9414	0.9337
N-1: Dower - Post Falls 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9466	0.939
N-1: Dworshak - Hatwai 500 kV + N-1: Bonners Ferry - Libby 115 kV				
STMARIES (48417)				0.9494

Row Labels	16HSLH	20HSPROJECTSLH	25HSPROJECTSLH	35HSPROJECTSLH
N-1: Dworshak - Hatwai 500 kV + N-1: Lancaster - Noxon 230 kV				
STMARIES (48417)				0.9495
N-1: Dworshak - Hatwai 500 kV + N-1: Noxon - Pine Creek 230 kV				
STMARIES (48417)				0.9482
N-1: Dworshak - Hatwai 500 kV + S-1: Rathdrum 115kV Switched Shunt				
STMARIES (48417)				0.9491
N-1: Dworshak - Taft 500 kV + N-1: Noxon - Pine Creek 230 kV				
STMARIES (48417)				0.949
N-1: Flathead - Hot Springs 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9486	0.9447	0.9373
N-1: Hot Springs - Noxon #1 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9494	0.9456	0.9379
N-1: Hot Springs - Noxon #2 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9494	0.9456	0.9379
N-1: Hot Springs - Placid Lake 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9496	0.9458	0.9382
N-1: Hot Springs - Rattle Snake 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9496	0.9458	0.9383
N-1: Hot Springs - Taft 500 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9488	0.9412
N-1: Lancaster - Noxon 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9485	0.9445	0.9369
N-1: Lancaster - Rathdrum 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9462	0.9386
N-1: Libby - Noxon 230 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9499	0.9461	0.9384
N-1: Noxon - Pine Creek 230 kV + T-1: Hatwai 500/230 kV				
OGARA (48297)				0.9463
STMARIES (48417)	0.9465	0.9451	0.9411	0.9325
N-1: Otis Orchards - Post Falls 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9469	0.9394
N-1: Pine Street - Rathdrum 115 kV (PNST-HOO) + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9463	0.9387
N-1: Pine Street - Rathdrum 115 kV (RAT-SPL) + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9463	0.9387
N-1: Pine Street - Usk 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9463	0.9387
N-1: Ramsey - Rathdrum #1 115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9499	0.946	0.9384
N-1: Rathdrum #1 230/115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9463	0.9387
N-1: Rathdrum #2 230/115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9463	0.9386
S-1: Hot Springs 500 kV Switched Shunt + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9499	0.9423
S-1: Pine Creek 115kV Switched Shunt + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9463	0.9387
S-1: Ramsey 115kV Switched Shunt + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9463	0.9387
S-1: Rathdrum 115kV Switched Shunt + T-1: Hatwai 500/230 kV				
OGARA (48297)				0.9498
STMARIES (48417)		0.9477	0.9438	0.9361
S-1: Sand Creek 115kV Switched Shunt + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9492	0.9453	0.9377
S-1: Sand Point 115kV Switched Shunt + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9496	0.9458	0.9382
T-1: Cabinet Gorge (12) 230/13.8 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9466	0.9389
T-1: Cabinet Gorge (34) 230/13.8 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)			0.9463	0.9387
T-1: Cabinet Gorge 230/115 kV + T-1: Hatwai 500/230 kV				
STMARIES (48417)		0.9498	0.9459	0.9383
T-1: Hatwai 500/230 kV + N-1: 3TM Burke - Thompson Falls A 115 kV (BUR-TOM)				
STMARIES (48417)		0.9497	0.9459	0.9383
T-1: Hatwai 500/230 kV + N-1: 3TM Burke - Thompson Falls A 115 kV				

Row Labels	16HSLH	20HSPROJECTSLH	25HSPROJECTSLH	35HSPROJECTSLH
(SALT-TAFA)				
STMARIES (48417)		0.9499	0.9461	0.9385
T-1: Hatwai 500/230 kV + N-1: Albeni Falls - Pine Street 115 kV				
STMARIES (48417)			0.9462	0.9386
T-1: Hatwai 500/230 kV + N-1: Albeni Falls - Sacheen 115 kV				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + N-1: Albeni Falls - Sand Creek 115 kV				
STMARIES (48417)		0.9495	0.9458	0.9382
T-1: Hatwai 500/230 kV + N-1: Appleway - Ramsey 115 kV				
STMARIES (48417)			0.9464	0.9389
T-1: Hatwai 500/230 kV + N-1: Appleway - Rathdrum 115 kV				
STMARIES (48417)		0.9498	0.9461	0.9384
T-1: Hatwai 500/230 kV + N-1: Bonners Ferry - Libby 115 kV				
STMARIES (48417)		0.9483	0.9444	0.9368
T-1: Hatwai 500/230 kV + N-1: Bonners Ferry - Sand Creek 115 kV				
STMARIES (48417)		0.9491	0.9452	0.9376
T-1: Hatwai 500/230 kV + N-1: Bronx - Cabinet 115 kV				
STMARIES (48417)		0.9496	0.9458	0.9382
T-1: Hatwai 500/230 kV + N-1: Bronx - Sand Creek 115 kV				
STMARIES (48417)		0.9494	0.9455	0.9379
T-1: Hatwai 500/230 kV + N-1: Burke - Pine Creek #3 115 kV (BUR-LKY)				
STMARIES (48417)		0.9497	0.9459	0.9382
T-1: Hatwai 500/230 kV + N-1: Burke - Pine Creek #3 115 kV (PIN-LKY)				
STMARIES (48417)			0.9466	0.9389
T-1: Hatwai 500/230 kV + N-1: Burke - Pine Creek #4 115 kV (BUR-BIG)				
STMARIES (48417)			0.9464	0.9387
T-1: Hatwai 500/230 kV + N-1: Burke - Pine Creek #4 115 kV (PIN-BIG)				
STMARIES (48417)			0.9467	0.9391
T-1: Hatwai 500/230 kV + N-1: Burke - Thompson Falls B 115 kV				
STMARIES (48417)		0.9499	0.9462	0.9385
T-1: Hatwai 500/230 kV + N-1: Coeur d'Alene 15th St - Pine Creek 115 kV				
STMARIES (48417)			0.9464	0.9388
T-1: Hatwai 500/230 kV + N-1: Coeur d'Alene 15th St - Ramsey 115 kV				
STMARIES (48417)		0.9496	0.9458	0.9382
T-1: Hatwai 500/230 kV + N-1: Coeur d'Alene 15th St - Rathdrum 115 kV				
STMARIES (48417)			0.9466	0.9392
T-1: Hatwai 500/230 kV + N-1: Columbia Falls - Kalispel 115 kV				
STMARIES (48417)			0.9462	0.9386
T-1: Hatwai 500/230 kV + N-1: Dower - Post Falls 115 kV				
STMARIES (48417)			0.9466	0.939
T-1: Hatwai 500/230 kV + N-1: Noxon 230kV Switched Shunt				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + N-1: Otis Orchards - Post Falls 115 kV				
STMARIES (48417)			0.9469	0.9394
T-1: Hatwai 500/230 kV + N-1: Pine Street - Rathdrum 115 kV (PNST-HOO)				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + N-1: Pine Street - Rathdrum 115 kV (RAT-SPL)				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + N-1: Pine Street - Usk 115 kV				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + N-1: Ramsey - Rathdrum #1 115 kV				
STMARIES (48417)		0.9499	0.946	0.9384
T-1: Hatwai 500/230 kV + N-1: Rathdrum #1 230/115 kV				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + N-1: Rathdrum #2 230/115 kV				
STMARIES (48417)			0.9463	0.9386
T-1: Hatwai 500/230 kV + S-1: Pine Creek 115kV Switched Shunt				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + S-1: Ramsey 115kV Switched Shunt				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + S-1: Rathdrum 115kV Switched Shunt				
OGARA (48297)				0.9498
STMARIES (48417)		0.9477	0.9438	0.9361
T-1: Hatwai 500/230 kV + S-1: Sand Creek 115kV Switched Shunt				
STMARIES (48417)		0.9492	0.9453	0.9377
T-1: Hatwai 500/230 kV + S-1: Sand Point 115kV Switched Shunt				

Row Labels	16HSLH	20HSPROJECTSLH	25HSPROJECTSLH	35HSPROJECTSLH
STMARIES (48417)		0.9496	0.9458	0.9382
T-1: Hatwai 500/230 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				
STMARIES (48417)			0.9466	0.9389
T-1: Hatwai 500/230 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + T-1: Cabinet Gorge 230/115 kV				
STMARIES (48417)		0.9498	0.9459	0.9383
T-1: Hatwai 500/230 kV + T-1: Hot Springs 500/230 kV				
STMARIES (48417)			0.9488	0.9412
T-1: Hatwai 500/230 kV + T-1: Hungry Horse #1 230/13.8 kV				
STMARIES (48417)			0.9474	0.9398
T-1: Hatwai 500/230 kV + T-1: Hungry Horse #4 230/13.8 kV				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + T-1: Libby 230/115 kV				
STMARIES (48417)		0.9493	0.9454	0.9377
T-1: Hatwai 500/230 kV + T-1: Noxon #1 230/13.8 kV				
STMARIES (48417)			0.948	0.9403
T-1: Hatwai 500/230 kV + T-1: Noxon #2 230/13.8 kV				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + T-1: Pine Creek #1 230/115 kV				
STMARIES (48417)			0.9469	0.9392
T-1: Hatwai 500/230 kV + T-1: Pine Creek #2 230/115 kV				
STMARIES (48417)			0.9467	0.9391
T-1: Hatwai 500/230 kV + T-1: Post Falls #1 115/2.4 kV				
STMARIES (48417)			0.9463	0.9387
T-1: Hatwai 500/230 kV + T-1: Rattlesnake #1 230/161 kV				
STMARIES (48417)			0.9471	0.9395
T-1: Hatwai 500/230 kV + T-1: Thompson Falls (123) 115/6.6 kV				
STMARIES (48417)			0.9467	0.9391
T-1: Hatwai 500/230 kV + T-1: Thompson Falls (456) 115/6.6 kV				
STMARIES (48417)			0.9467	0.9391
SSEE				
N-2 (ROW): Bell - Taft 500 kV and Bell - Lancaster 230 kV and Beacon - Rathdrum 230 kV and Boulder - Lancaster 230 kV				
STMARIES (48417)	0.9499			0.9491

Potential violations identified in Heavy Winter, and Heavy Summer Scenarios.

Light Scenario Assessment Results

No potential violations idenitified

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- St. Maries Capacitor Installation Transmission Plan (to be complete in 2016)

4.3.4 Conceptual

Cabinet LTC

A bus outage or breaker failure at Sand Creek Station causing the Bronx – Sand Creek 115 kV Transmission Line to be open at Sand Creek Station results in greater than 5% voltage deviation at Sand Point Station. Automating the load tap changer on the Cabinet 230/115 kV Transformer will reduce the voltage deviation at Sand Point Station.

Rathdrum 115 kV Bus Reconfiguration

The tie breaker failure on the Rathdrum 115 kV bus causes the Otis Orchards – Post Falls 115 kV Transmission Line to exceed its applicable facility rating beginning in 2034. The completion of the Coeur d'Alene – Pine Creek 115 kV Transmission Line rebuild project significantly improves the performance of the System in the Coeur d'Alene area and defers the need to reconfigure the 115 kV buses at Rathdrum Station. Reconfiguration of the buses to eliminate the loss of all 115 kV transmission lines at the station for a single breaker failure will mitigate the observed System deficiencies. Double bus, double breaker or breaker and a half configuration are potential bus configurations to carry forward.

4.3.5 New Proposals

There are no new proposed Corrective Action Plans planned for the Coeur d'Alene area.

4.4 Single System Project (non-corrective action plans)

4.4.1 Noxon Rapids 230 kV Switchyard Rebuild

The existing Noxon Rapids 230 kV Switchyard has been identified to be in need of a rebuild due to the present age and condition of the equipment included in the station. The existing bus work is constructed as strain bus and configured as a single bus with a tie breaker separating the East and West buses. Presently the station is the interconnection point of the Noxon Rapids Hydro Electric Dam and a significant asset in the reliable operation of the Western Montana Hydro (defined as the combination of Noxon Rapids, Cabinet Gorge, Hungry Horse and Libby generation) Complex. An unplanned outage caused by equipment failure or other means causes curtailment of the local generation facilities. Due to the significance of the station, a complete rebuild will require detailed coordination with Avista's resource department and neighboring utilities, primarily the BPA.

High voltage issues at Noxon and Cabinet stations has been identified and the construction of two steps of 50 MVAr reactor banks are being installed at the Noxon Station. Following the completion of the new reactor banks, high voltages are still observed during outages of the reactor banks subsequent to other outages in the area (see Figure III-5). The Noxon Station is planned for a complete green field rebuild. The rebuild will include reterminating the two reactor banks to separate buses eliminating the common point of failure for both reactor banks.

A single bank of 50 MVAr is sufficient for maintaining the voltage within applicable facility ratings.

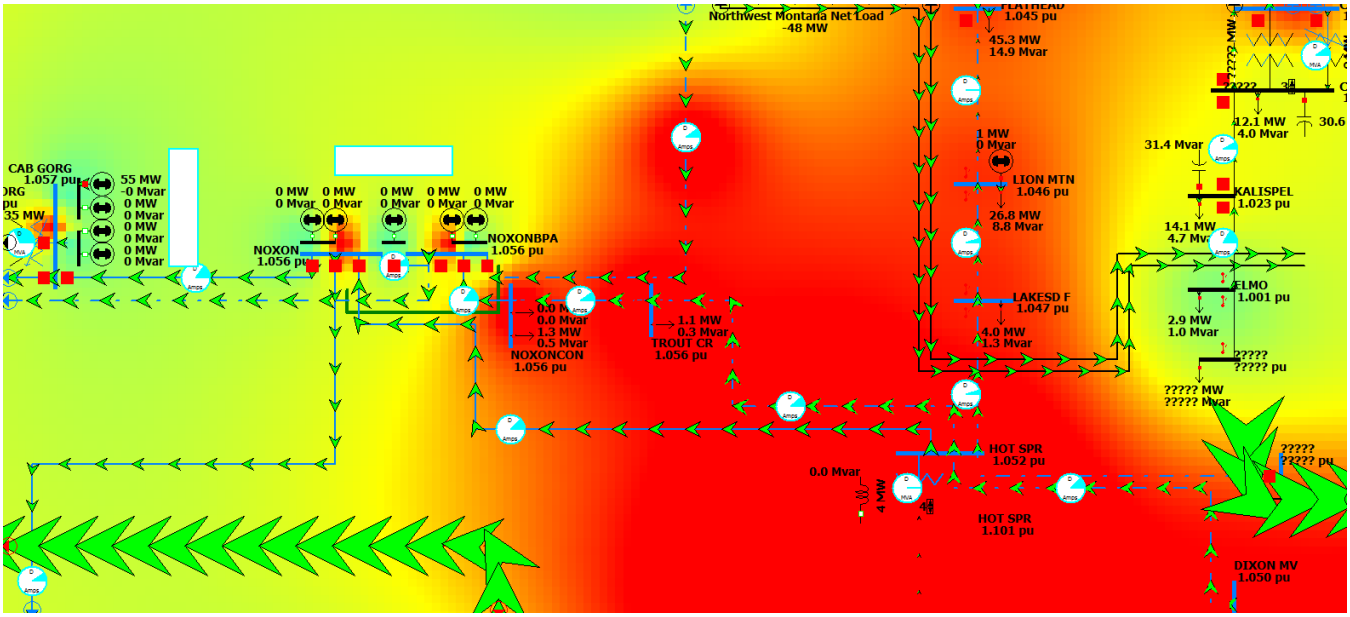
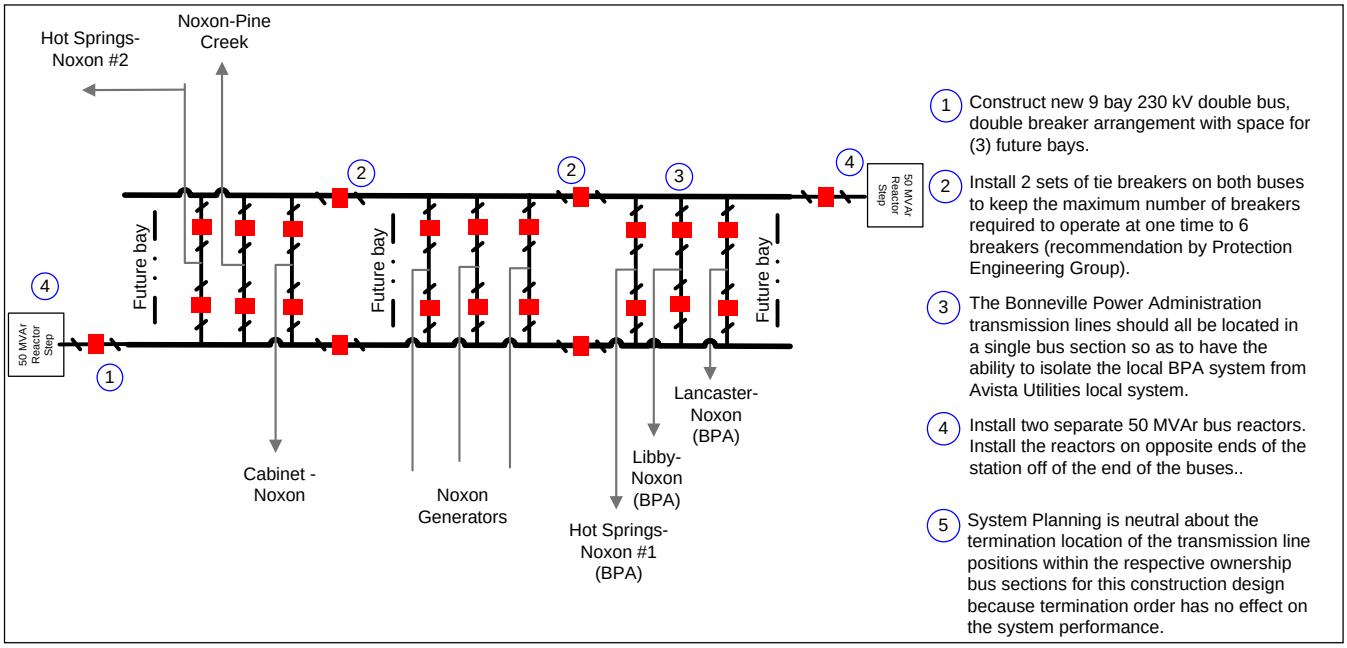


FIGURE III-5: N-1: HOT SPRINGS 500 KV SWITCHED SHUNT + N-1: NOXON 230KV SWITCHED SHUNT IN 20LW



4.4.2 Big Creek Station Rebuild

The Big Creek Station is a wood substation and has been identified by the Substation Engineering Department to be rebuilt under the wood substation rebuild program. Construction should be planned in the five to ten year planning horizon. Coordination with other station projects or potential load increases may require the Big Creek Station rebuild to be pushed

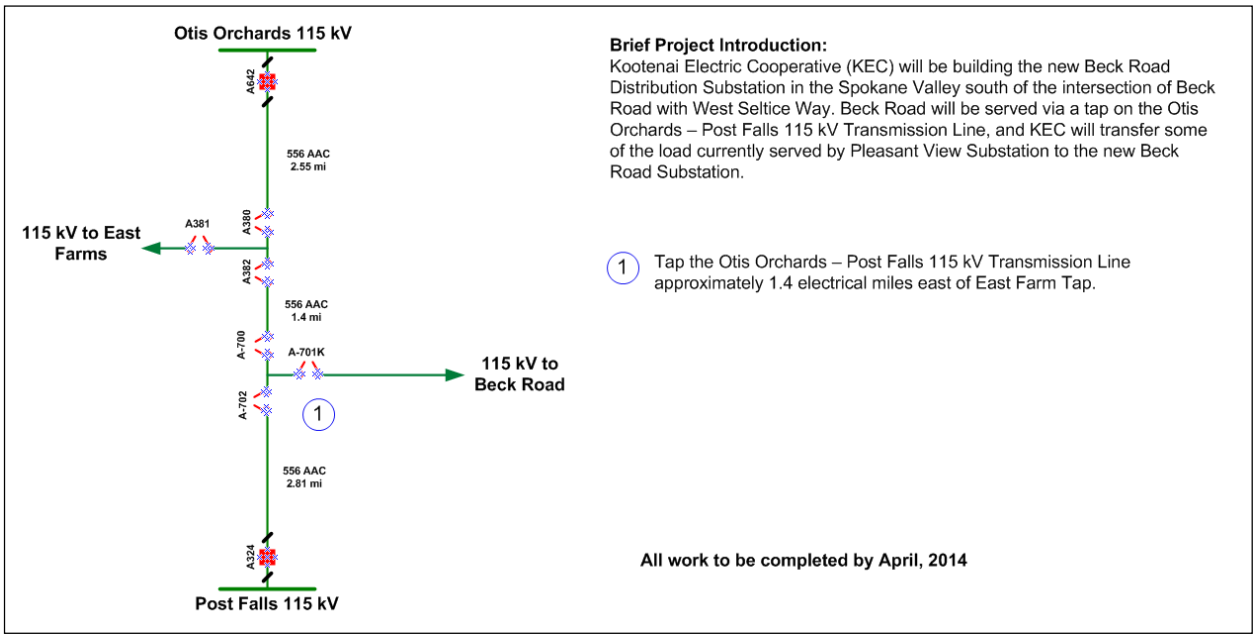
forward into the five year planning horizon. Projected load growth at the Sunshine Mine served from Big Creek Station may require adding 24 kV transformation and feeders to the station.

4.4.3 Burke – Pine Creek #3 & #4 Rebuild 115 kV Transmission Line Rebuild

Reconstruction of the existing Burke – Pine Creek #3 & #4 115 kV Transmission Lines is in construction. The yet-to-be completed work has been broken in the following phases:

Reconstruct approximately (4) miles (8 miles total) of Avista 115kV transmission facilities on the Burke – Pine Creek #3 & #4 115 kV Transmission Lines between Big Creek Station and a point immediately east of the retired Bunker Hill Mine smelter. Years of smelter atmospheric discharge has caused considerable corrosion and weathering to these down-wind structures. Present conductors are 397 ACSR “Ibis” and 250 19-strand copper designs. New conductor will be a 795 ACSR “Drake” capable of 150 MVA at 40C.

Reconstruct approximately (5-6) miles of Avista 115kV transmission facilities on the Burke – Pine Creek #4 115 kV Transmission Line between Wallace Station and Burke Station. Onerous access makes the existing route very difficult to maintain the line originally constructed in 1941. Present conductor is a 250 19-strand copper design. New conductor will be a 795 ACSR “Drake” capable of 150 MVA at 40C.



4.4.4 Carlin Bay Station

Forecasted load growth along the east side of Coeur d’Alene Lake is expected to cause the total load to exceed the capability of the existing 13.2 kV distribution system in the area. A new substation named Carlin Bay Station has been proposed and property was purchased in 2010. Preliminary proposals include connecting the new substation to Avista’s Transmission System by a 13 mile radial 115 kV transmission line to the existing O’Gara Station. Rebuilding the

existing O'Gara Station to be a switching station is recommended to mitigate the reliability impact to the area by reducing the transmission line exposure distances.

4.4.5 Bronx Station

The addition of distribution facilities to the existing Bronx Station will help support load growth in the surrounding area. Distribution capacity at Bronx Station and transferring load to the Bronx Station will relieve loading on Sandpoint and Oden Station distribution facilities, allowing extra capacity to support load growth in Dover. The expansion of Bronx Station may be coordinated with the rebuild of the Bronx – Cabinet Gorge 230 kV Switchyard and Bronx – Sand Creek 115 kV Transmission Lines.

4.4.6 Cabinet Gorge Switching Station

A new 230 kV switching station located along the transmission line right of way south of Cabinet Gorge has been proposed. The station would interconnect the Lancaster – Noxon 230 kV Transmission Line with the Cabinet – Rathdrum and Cabinet – Noxon 230 kV transmission lines. Completion of the project may reduce generation capacity restrictions during certain outage conditions.

4.4.7 Noxon – Pine Creek #2 230 kV Transmission Line

The existing Noxon – Pine Creek 230 kV Transmission Line is constructed as a double circuit transmission line 60% of the total length from Noxon Station. During the initial construction of the transmission line, the double circuit was intended to be completed all the way to Pine Creek Station to provide sufficient transmission capacity to serve the mining load in the Silver Valley. The mining load requirements diminished and the unconstructed portion of the transmission line was finished as a single circuit to meet the performance requirements at the time. The completion of the double circuit would provide two 230 kV transmission line from Noxon to Pine Creek with the intention of increasing the transfer capability from the Clark Fork complex.

Other alternatives are under consideration. The preferred project will be determined based on defining the desired performance under a given set of scenarios.

4.4.8 St. Maries SCADA Upgrade/Add Feeder

The Saint Maries Station is due for a full SCADA install within 2 years. Additionally, another feeder out of the station has been debated for some time. The minor rebuild associated with a SCADA install may be a good time to complete this.

4.4.9 Priest River Station

Current plans call for replacement of the 4S40 breaker. Priest River Station station is due for a condition rebuild in the 5-10 year timeframe. This is one of few stations that still has bus regulation, it should be changed to standard feeder regulation. The capacitor bank is in disrepair and needs replaced. It is also a wood sub that needs modernizing to steel.

4.4.10 Sandpoint, Sagle, and Oden Grid Modernization

The Sandpoint Grid Modernization project will include SCADA and equipment upgrades at the Sandpoint, Sagle, and Oden stations. This was initially slated as a pilot smart grid installation before the Smart Grid Investment Grants enabled the Spokane and Pullman installations, and so is a natural progression. This project should leave these stations in good shape for many years.

4.4.11 Benewah – Pine Creek 230 kV Transmission Line Rebuild

The age and condition of the Benewah – Pine Creek 230 kV Transmission Line has reached a trigger within the Avista Asset Management process, and this line will be rebuilt to current standards. Capacity change requirements are still under evaluation.

4.4.12 Cabinet – Noxon 230 kV Transmission Line Rebuild

The age and condition of the Cabinet – Noxon 230 kV Transmission Line has reached a trigger within the Avista Asset Management process, and this line will be rebuilt to current standards. The rebuild will include reconductoring the transmission line with 1590 ACSS conductor.

4.5 Spare Equipment Study

Facility rating violations from the Spare Equipment Study are provided in Table III-9.

4.5.1 Rathdrum Transformer Failure

Failure of a Rathdrum #1 or #2 230/115 kV transformer requiring complete replacement causes thermal overloads on local 115 kV transmission lines when a subsequent bus outage or breaker failure occurs. Similar issues occur when all transformers are in service and a Rathdrum tie breaker failure occurs.

The observed issues with loss of a Rathdrum transformer will be mitigated by completion of projects previously mentioned including the Coeur d'Alene – Pine Creek 115 kV Transmission Line Rebuild and Bronx – Cabinet and Bronx – Sand Creek 115 kV Transmission Line rebuild projects. There is no need for acquiring a spare 230/115 kV transformer for the Coeur d'Alene area.

4.5.2 Cabinet Transformer Failure

Failure of the Cabinet 230/115 kV Transformer requiring complete replacement causes low voltages issues when subsequent outages related to Albeni Falls Station occur. The remaining system leaves only the Libby 230/115 kV Transformer to serve area.

Additional review of the BPA's capacitor functionality at Sand Creek and Bonners Ferry stations is required. A spare 230/115 kV transformer capable of replacing the Cabinet 230/115 kV Transformer will not adequately address the issue. The observed issues with loss of a Cabinet transformer will be mitigated by completion of the Sandpoint Reinforcement project and the Bell Area 115 kV line reconductoring. There is no need for acquiring a spare 230/115 kV transformer for the Coeur d'Alene area.

Row Labels	CAB	RAT1	RAT2
P1			
T-1: Libby 230/115 kV			
CLRKFORK (48077) -> ODEN (48293) CKT 1 at CLRKFORK		101.0 %	102.1 %
P2			
BF: A506 Rathdrum 115 kV, Pine Street-Rathdrum			
DALTON A (48093)			0.9483
HAYDEN (48148)			0.9474
RATHDRMW (48355) -> HUETTER (48159) CKT 1 at HUETTER			104.0 %
BF: B960 Albeni Falls 115 kV, Albeni Falls-Sacheen			
BRONX (48047)	0.9061		
CAB GORG (48057)	0.9004		
CABINETG (48065)	0.9004		
CLRKFORK (48077)	0.901		
ODEN (48293)	0.9027		
PRIEST A (48347)	0.9067		
SANDPT A (48377)	0.9082		
BF: B964 Albeni Falls 115 kV, Albeni Falls-Pine Street			
BRONX (48047)	0.9062		
CAB GORG (48057)	0.9004		
CABINETG (48065)	0.9004		
CLRKFORK (48077)	0.901		

Row Labels	CAB	RAT1	RAT2
ODEN (48293)	0.9027		
PRIEST A (48347)	0.9068		
SANDPT A (48377)	0.9082		
BF: R427 Beacon North & South 230 kV			
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1 at WAIKIKIT	116.4 %		
BUS: Albeni Falls 115 kV			
BRONX (48047)	0.9061		
CAB GORG (48057)	0.9004		
CABINETG (48065)	0.9004		
CLRKFORK (48077)	0.901		
ODEN (48293)	0.9027		
PRIEST A (48347)	0.9067		
SANDPT A (48377)	0.9082		
BUS: Rathdrum East 115 kV			
DALTON A (48093)			0.9483
HAYDEN (48148)			0.9474
RATHDRMW (48355) -> HUETTER (48159) CKT 1 at HUETTER			104.0 %
N-1: Albeni Falls - Sand Creek 115 kV Open @ ALB			
BRONX (48047)	0.9059		
CAB GORG (48057)	0.9002		
CABINETG (48065)	0.9002		
CLRKFORK (48077)	0.9008		
ODEN (48293)	0.9025		
PRIEST A (48347)	0.9065		
SANDPT A (48377)	0.908		
N-1: Bonner Ferry - Libby 115 kV Open @ LIB			
CLRKFORK (48077) -> ODEN (48293) CKT 1 at CLRKFORK		100.8 %	101.9 %

TABLE III-9: COEUR D'ALENE SPARE EQUIPMENT CONTINGENCY ANALYSIS RESULTS.

4.6 Voltage Stability Study

A Load Ramp PV Curve analysis was conducted while monitoring all buses in the Coeur d'Alene area. All loads within the Coeur d'Alene area were increased until voltage collapse occurred. All additional generation necessary to supply the increase in load came from a distribution of all generation in WECC except those within the Coeur d'Alene area.

The theoretical flow limit is 1750 MW for all lines in service condition. The critical bus under all lines in service condition is St. Maries Station. A tie breaker failure at Rathdrum Statoin with the Coeur d'Alene Area Reconfiguration project causes concequential load loss of all load in the area therefore the outage does not demonstrate a flow limit as simulated. As load increases in the Coeur d'Alene area, the limiting contingency is the double circuit out of Beacon – Rathdrum and Lancaster – Rathdrum 230 kV transmission lines remains the tie breaker failure at Rathdrum Station with total area load of 625 MW (see Figure III-6). The critical bus under the Rathdrum tie breaker failure contingency is Hayden Station.

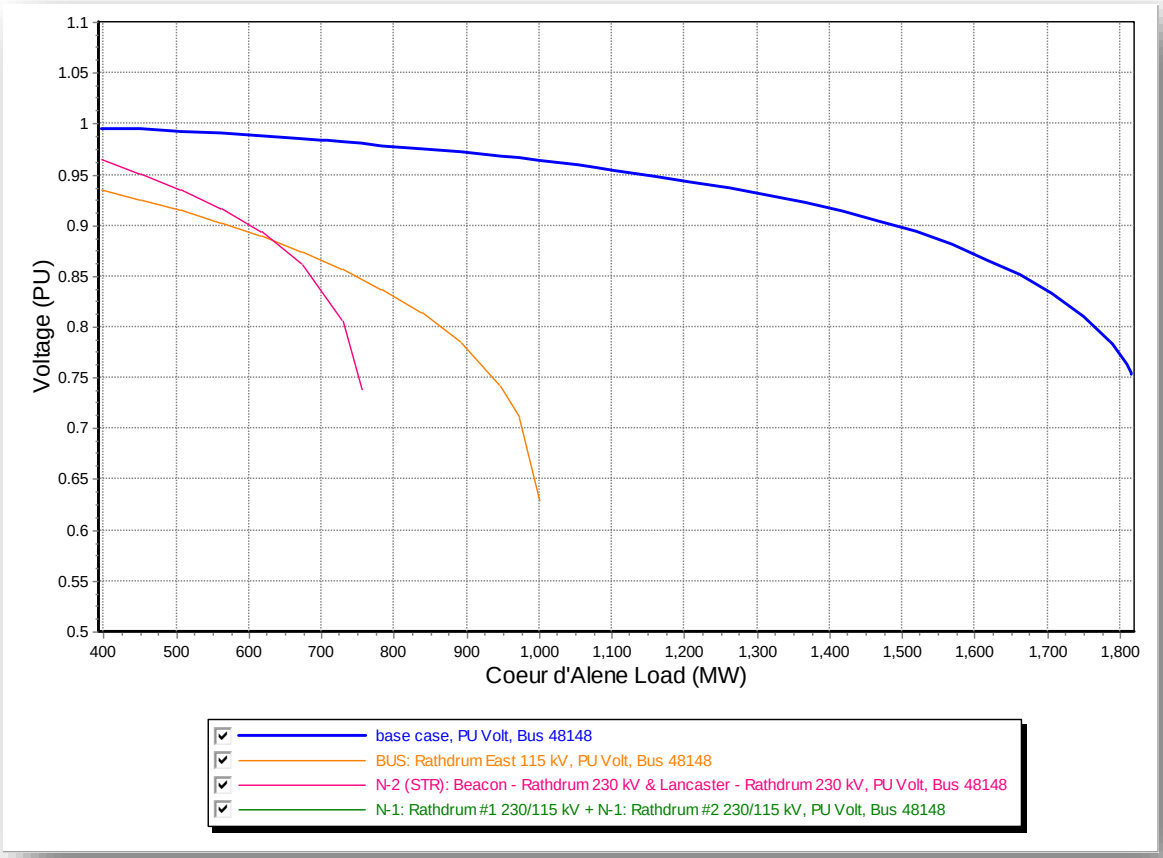


FIGURE III-6: COEUR D'ALENE LOAD RAMP PV CURVE RESULTS – EXISTING SYSTEM

The load ramp PV curve analysis was repeated with the assumption that all planned corrective action plans listed above are constructed. The limiting contingency remains the tie breaker failure at Rathdrum Station but with a total area load of 1000 MW, an increase of 375 MW prior to project construction.

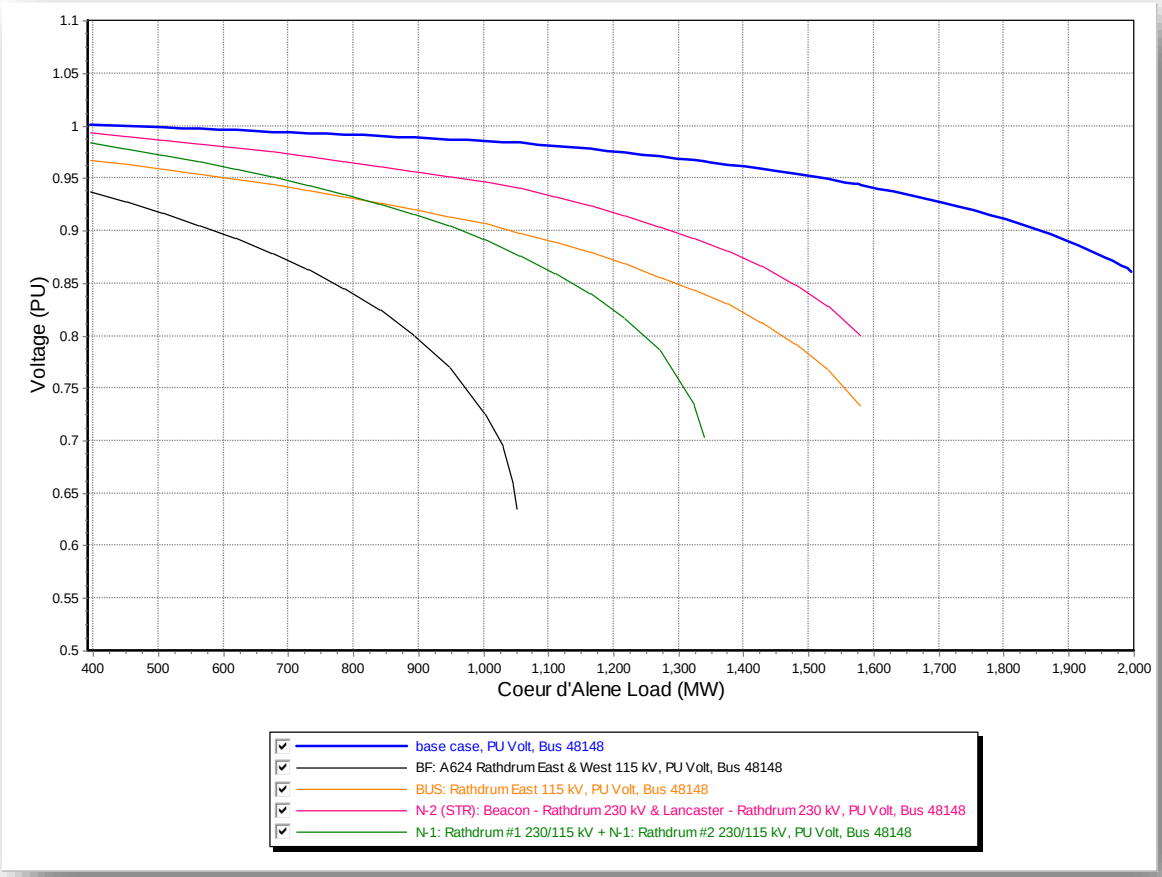


FIGURE III-7: COEUR D'ALENE LOAD RAMP PV CURVE RESULTS – PLANNED SYSTEM

4.7 Stability Study Results

Heavy Summer Scenario

Row Labels	Column Labels: 16HS – Max of Voltage Dip or Frequency	16HS – Max of Duration or Time	20HSPROJECTS – Max of Voltage Dip or Frequency	20HSPROJECTS – Max of Duration or Time	25HSPROJECTS – Max of Voltage Dip or Frequency	25HSPROJECTS – Max of Duration or Time	Mitigation
P6							
N-2: Conkelley - Libby 230 kV and Libby - Noxon 230 kV 3P							
Out of Step Generator							
LIB 01 14kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s	
LIB 02 14kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s	
LIB 03 14kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s	
LIB 04 14kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s	
SMITHFLS 14kV	OOS	4.7 s					
TROY 115kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	
WECC Category C Voltage Dip Any Bus							
BONNERS 115kV	-63.3 %		-59.6 %		-58.9 %		
BRONX 115kV	-33.6 %		-31.7 %		-31.5 %		
DUFORT 115kV	-33.8 %		-31.4 %		-31.2 %		
LIBBY 115kV	-31.3 %		-32.6 %		-33.0 %		BPA Issue. Will be mitigated by Noxon Station Rebuild.
LIBBYFEC 115kV	-53.1 %		-54.9 %		-55.5 %		
MOYIE T 115kV	-74.8 %		-71.1 %		-70.4 %		
MOYIE TX 115kV	-74.7 %		-70.9 %		-70.1 %		
MT HALL 115kV	-63.8 %		-59.6 %		-58.9 %		
N BENCH 115kV	-74.7 %		-71.0 %		-70.2 %		
ODEN 115kV	-31.1 %						
SAGLE 115kV	-33.8 %		-31.4 %		-31.2 %		
SAMUELS 115kV	-47.6 %		-44.4 %		-44.0 %		
SAND CRK 115kV	-41.6 %		-38.6 %		-38.2 %		
SAND TP 115kV	-34.2 %		-31.8 %		-31.6 %		
SANDPONT 115kV	-33.7 %		-31.3 %		-31.2 %		
SANDPT A 115kV	-37.6 %		-34.5 %		-34.2 %		
SELLE 115kV	-42.9 %		-39.8 %		-39.4 %		
SMITHFLS 115kV	-63.5 %		-59.6 %		-58.9 %		
SMITHFLS 13.8kV	-63.0 %		-59.6 %		-58.9 %		
TROY 115kV	-79.9 %		-82.5 %		-83.3 %		
YAAK 115kV	-96.7 %		-93.0 %		-92.4 %		

Heavy Summer Low Hydro Scenario

Row Labels	Column Labels 16HSLH		20HSLHPROJECTS		25HSLHPROJECTS		
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	
P1							
N-1: Libby - Noxon 230 kV 3P @ LIB							
Out of Step Generator							
LIB 01 14kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
LIB 02 14kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
LIB 03 14kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
LIB 04 14kV	OOS	1.9 s	OOS	1.9 s	OOS	1.9 s	
TROY 115kV	OOS	2.0 s	OOS	2.0 s	OOS	2.0 s	
WECC Category B Frequency							
COL FALL 115kV	59.1 Hz	8.0 ~	59.1 Hz	8.0 ~	59.1 Hz	8.0 ~	
CONKELLY 230kV	58.9 Hz	8.5 ~	58.9 Hz	8.5 ~	58.9 Hz	8.5 ~	
EUREKA T 115kV	59.1 Hz	7.5 ~	59.1 Hz	8.0 ~	59.1 Hz	8.0 ~	
FLATHEAD 230kV			59.3 Hz	7.0 ~	59.3 Hz	7.0 ~	
MOYIE TX 115kV	59.3 Hz	8.0 ~	59.3 Hz	8.0 ~	59.3 Hz	8.0 ~	
N BENCH 115kV	59.3 Hz	8.0 ~	59.3 Hz	8.0 ~	59.3 Hz	8.0 ~	
STILLWTR 115kV	59.1 Hz	7.5 ~	59.1 Hz	8.0 ~	59.1 Hz	8.0 ~	
TREGO 115kV	59.1 Hz	7.5 ~	59.1 Hz	8.0 ~	59.1 Hz	8.0 ~	
TROY 115kV	56.9 Hz	8.5 ~	57.0 Hz	9.0 ~	57.0 Hz	9.0 ~	
TRUMB CR 230kV	58.6 Hz	9.0 ~	58.6 Hz	8.5 ~	58.6 Hz	8.5 ~	Noxon Rebuild project and/or Sandpoint Reinforcement Project will mitigate
YAAK 115kV	58.7 Hz	10.0 ~	58.7 Hz	10.0 ~	58.7 Hz	10.0 ~	
WECC Category B Voltage Dip Load Bus							
BONNERS 115kV	-46.9 %		-46.8 %		-46.8 %		
COL FALL 115kV	-62.5 %		-62.3 %		-62.3 %		
CONKELLY 230kV	-68.9 %		-68.6 %		-68.7 %		
DUFORT 115kV	-26.1 %		-26.1 %		-26.1 %		
ELMO 115kV	-25.6 %		-25.6 %		-25.6 %		
EUREKA T 115kV	-62.6 %		-62.5 %		-62.5 %		
FLATHEAD 230kV	-56.6 %		-56.4 %		-56.4 %		
HASKILL 230kV	-99.8 %		-99.1 %		-99.0 %		
KALISPEL 115kV	-52.8 %		-52.6 %		-52.6 %		
LAKESD F 230kV	-42.3 %		-42.3 %		-42.3 %		
LIBBYFEC 115kV	-90.4 %		-90.7 %		-90.6 %		
LION MTN 230kV	-46.2 %		-46.2 %		-46.2 %		
MOYIE TX 115kV	-55.4 %		-55.1 %		-55.1 %		
MT HALL 115kV	-45.3 %		-46.8 %		-46.9 %		
N BENCH 115kV	-55.4 %		-55.1 %		-55.2 %		
ODEN 115kV	-25.1 %						
SAGLE 115kV	-26.1 %		-26.1 %		-26.1 %		
SAMUELS 115kV	-36.0 %		-35.8 %		-35.8 %		
SANDPONT 115kV	-26.1 %		-26.0 %		-26.1 %		
SANDPT A 115kV	-29.3 %		-28.8 %		-28.9 %		
SELLE 115kV	-32.7 %		-32.4 %		-32.5 %		

Row Labels	Column Labels 16HSLH		20HSLHPROJECTS		25HSLHPROJECTS	
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time
STILLWTR 115kV	-62.6 %		-62.4 %		-62.4 %	
TREGO 115kV	-62.6 %		-62.5 %		-62.5 %	
TROY 115kV	-89.3 %		-88.8 %		-88.9 %	
TRUMB CR 230kV	-74.7 %		-74.4 %		-74.4 %	
YAAK 115kV	-71.7 %		-71.4 %		-71.5 %	
WECC Category B Voltage Dip Load Bus Duration						
BONNERS 115kV	-46.9 %	35.0 ~	-46.8 %	36.0 ~	-46.8 %	36.0 ~
COL FALL 115kV	-62.5 %	37.5 ~	-62.3 %	37.5 ~	-62.3 %	37.5 ~
CONKELLY 230kV	-68.9 %	39.5 ~	-68.6 %	39.5 ~	-68.7 %	39.5 ~
EUREKA T 115kV	-62.6 %	38.5 ~	-62.5 %	38.5 ~	-62.5 %	38.5 ~
FLATHEAD 230kV	-56.6 %	37.0 ~	-56.4 %	36.5 ~	-56.4 %	36.5 ~
HASKILL 230kV	-99.8 %	40.5 ~	-99.1 %	40.5 ~	-99.0 %	40.5 ~
KALISPEL 115kV	-52.8 %	35.5 ~	-52.6 %	35.5 ~	-52.6 %	35.5 ~
LAKESD F 230kV	-42.3 %	32.5 ~	-42.3 %	32.0 ~	-42.3 %	32.0 ~
LIBBYFEC 115kV	-90.4 %	39.5 ~	-90.7 %	40.0 ~	-90.6 %	40.0 ~
LION MTN 230kV	-46.2 %	34.0 ~	-46.2 %	34.0 ~	-46.2 %	34.0 ~
MOYIE TX 115kV	-55.4 %	37.0 ~	-55.1 %	37.5 ~	-55.1 %	37.5 ~
MT HALL 115kV	-45.3 %	34.0 ~	-46.8 %	36.0 ~	-46.9 %	36.0 ~
N BENCH 115kV	-55.4 %	37.0 ~	-55.1 %	37.5 ~	-55.2 %	37.5 ~
SAMUELS 115kV	-36.0 %	29.5 ~	-35.8 %	30.0 ~	-35.8 %	30.0 ~
SANDPT A 115kV			-28.8 %	23.0 ~	-28.9 %	23.0 ~
SELLE 115kV	-32.7 %	27.0 ~	-32.4 %	27.0 ~	-32.5 %	27.0 ~
STILLWTR 115kV	-62.6 %	38.5 ~	-62.4 %	37.5 ~	-62.4 %	38.0 ~
TREGO 115kV	-62.6 %	38.5 ~	-62.5 %	38.0 ~	-62.5 %	38.0 ~
TROY 115kV	-89.3 %	39.5 ~	-88.8 %	40.0 ~	-88.9 %	40.0 ~
TRUMB CR 230kV	-74.7 %	40.0 ~	-74.4 %	39.5 ~	-74.4 %	39.5 ~
YAAK 115kV	-71.7 %	38.5 ~	-71.4 %	39.5 ~	-71.5 %	39.5 ~
WECC Category B Voltage Dip Non-Load Bus						
BRONX 115kV	-31.6 %					
COL FALL E 230kV	-67.3 %		-67.0 %		-67.0 %	
COL FALL W 230kV	-67.3 %		-67.0 %		-67.0 %	
HUNGHR12 13.8kV	-78.3 %		-70.8 %		-70.8 %	
HUNGHR34 13.8kV	-68.4 %		-68.0 %		-68.0 %	
HUNGRY H 230kV	-68.4 %		-68.0 %		-68.0 %	
LIB 01 13.8kV	-50.5 %		-50.7 %		-50.7 %	
LIB 02 13.8kV	-50.3 %		-50.6 %		-50.5 %	
LIB 03 13.8kV	-50.5 %		-50.8 %		-50.8 %	
LIB 04 13.8kV	-50.5 %		-50.7 %		-50.7 %	
LIB 05 13.8kV	-62.5 %		-62.8 %		-62.8 %	
LIB 06 13.8kV	-62.5 %		-62.8 %		-62.8 %	
LIB PH1 230kV	-62.5 %		-62.8 %		-62.7 %	

Row Labels	Column Labels 16HSLH Max of Voltage Dip or Frequency	Max of Duration or Time	20HSLHPROJECTS Max of Voltage Dip or Frequency	Max of Duration or Time	25HSLHPROJECTS Max of Voltage Dip or Frequency	Max of Duration or Time
LIB PH2 230kV	-62.5 %		-62.8 %		-62.8 %	
LIB TX1 100kV	-67.6 %		-67.9 %		-67.9 %	
LIB TX2 100kV	-67.8 %		-68.1 %		-68.1 %	
LIB TX3 100kV	-62.5 %		-62.8 %		-62.8 %	
LIBBY 115kV	-74.4 %		-74.8 %		-74.7 %	
LIBBY 230kV	-63.2 %		-63.5 %		-63.5 %	
MOYIE T 115kV	-55.4 %		-55.2 %		-55.3 %	
SAND CRK 115kV	-31.8 %		-31.5 %		-31.6 %	
SAND TP 115kV	-30.6 %					
SMITHFLS 115kV	-43.6 %		-46.8 %		-46.9 %	
SMITHFLS 13.8kV	-38.5 %		-46.8 %		-46.9 %	
N-1: Libby - Noxon 230 kV 3P @ NRS						
WECC Category B Voltage Dip Load Bus						
CONKELLY 230kV	-25.1 %					
HASKILL 230kV	-26.4 %		-25.4 %		-25.6 %	
LIBBYFEC 115kV	-25.6 %		-25.5 %		-25.8 %	
MOYIE TX 115kV	-25.1 %		-25.6 %		-25.7 %	
N BENCH 115kV	-25.1 %		-25.6 %		-25.8 %	
TROY 115kV	-25.3 %		-25.2 %		-25.4 %	
TRUMB CR 230kV	-25.0 %		-25.4 %		-25.4 %	
YAAK 115kV	-25.6 %		-25.2 %		-25.5 %	
WECC Category B Voltage Dip Load Bus Duration						
HASKILL 230kV	-28.7 %	21.0 ~	-28.5 %	20.5 ~	-28.4 %	20.5 ~
LIBBYFEC 115kV			-28.5 %	20.5 ~	-28.5 %	20.5 ~
TROY 115kV			-28.5 %	21.0 ~	-28.5 %	21.0 ~
YAAK 115kV	-27.1 %	21.0 ~	-27.9 %	21.0 ~	-28.1 %	21.0 ~
P6						
N-2: Conkelley - Libby 230 kV and Libby - Noxon 230 kV 3P						
Out of Step Generator						
LIB 01 14kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s
LIB 02 14kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s
LIB 03 14kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s
LIB 04 14kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s
SMITHFLS 14kV	OOS	5.4 s				
TROY 115kV	OOS	1.4 s	OOS	1.4 s	OOS	1.4 s
WECC Category C Voltage Dip Any Bus						
BONNERS 115kV	-61.8 %		-59.4 %		-59.4 %	
BRONX 115kV	-32.8 %		-31.8 %		-31.8 %	
DUFORT 115kV	-33.2 %		-31.8 %		-31.8 %	
LIBBY 115kV	-32.1 %		-33.4 %		-33.3 %	
LIBBYFEC 115kV	-54.1 %		-55.6 %		-55.5 %	

Row Labels	16HSLH Max of Voltage Dip or Frequency	16HSLH Max of Duration or Time	20HSLHPROJECTS Max of Voltage Dip or Frequency	20HSLHPROJECTS Max of Duration or Time	25HSLHPROJECTS Max of Voltage Dip or Frequency	25HSLHPROJECTS Max of Duration or Time
MOYIE T 115kV	-73.3 %		-70.8 %		-70.9 %	
MOYIE TX 115kV	-73.2 %		-70.6 %		-70.6 %	
MT HALL 115kV	-61.3 %		-59.4 %		-59.4 %	
N BENCH 115kV	-73.3 %		-70.6 %		-70.7 %	
ODEN 115kV	-30.2 %					
SAGLE 115kV	-33.2 %		-31.8 %		-31.8 %	
SAMUELS 115kV	-46.6 %		-44.4 %		-44.5 %	
SAND CRK 115kV	-40.7 %		-38.7 %		-38.7 %	
SAND TP 115kV	-33.6 %		-32.2 %		-32.2 %	
SANDPONT 115kV	-33.2 %		-31.7 %		-31.8 %	
SANDPT A 115kV	-36.7 %		-34.5 %		-34.6 %	
SELLE 115kV	-41.9 %		-39.9 %		-39.9 %	
SMITHFLS 115kV	-60.1 %		-59.4 %		-59.4 %	
SMITHFLS 13.8kV	-56.4 %		-59.4 %		-59.4 %	
TROY 115kV	-81.0 %		-83.1 %		-83.0 %	
YAAK 115kV	-95.1 %		-92.7 %		-92.8 %	

Light Scenarios

Row Labels	16LS Max of Voltage Dip or Frequency	16LS Max of Duration or Time	16LW Max of Voltage Dip or Frequency	16LW Max of Duration or Time	20LSPROJECTS Max of Voltage Dip or Frequency	20LSPROJECTS Max of Duration or Time	20LWPROJECTS Max of Voltage Dip or Frequency	20LWPROJECTS Max of Duration or Time	
P4									
BF: 4111 Dworshak-Taft, Hot Springs-Taft 3P (DWOR-TAFT @ TAFT)									
Out of Step Generator									
HUNGHR12 14kV	OOS	1.9 s	OOS	2.3 s	OOS	1.9 s	OOS	2.6 s	
LIB 01 14kV	OOS	1.8 s			OOS	1.8 s			
LIB 02 14kV	OOS	1.8 s			OOS	1.8 s			BPA Issue
LIB 03 14kV	OOS	1.8 s			OOS	1.8 s			
LIB 04 14kV	OOS	1.8 s			OOS	1.8 s			
LIB 05 14kV	OOS	1.8 s			OOS	1.8 s			
LION MTN 230kV	OOS	2.0 s							
SMITHFLS 14kV	OOS	1.9 s			OOS	2.0 s			
TROY 115kV	OOS	1.9 s			OOS	1.9 s			

Row Labels	Column Labels 16LS Max of Voltage Dip or Frequency	Max of Duration or Time	16LW Max of Voltage Dip or Frequency	Max of Duration or Time	20LSPROJECTS Max of Voltage Dip or Frequency	20LWPROJECTS Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	
BF: 4119 Bell-Taft, Garrison-Taft #1 3P (BELL-TAFT @ TAFT)									
Out of Step Generator									
HUNGHR12 14kV	OOS	**1.9 s**	OOS	**1.9 s**	OOS	**2.0 s**			
KERR GEN 1 14kV			OOS	**2.0 s**					
KERR GEN 2 14kV			OOS	**2.0 s**					
KERR GEN 3 14kV			OOS	**2.0 s**					
LIB 01 14kV	OOS	**1.9 s**			OOS	**1.9 s**			BPA Issue
LIB 02 14kV	OOS	**1.9 s**			OOS	**1.9 s**			
LIB 03 14kV	OOS	**1.9 s**			OOS	**1.9 s**			
LIB 04 14kV	OOS	**1.9 s**			OOS	**1.9 s**			
LIB 05 14kV	OOS	**1.9 s**			OOS	**1.9 s**			
LION MTN 230kV	OOS	**2.0 s**			OOS	**2.0 s**			
SMITHFLS 14kV	OOS	**2.1 s**			OOS	**2.2 s**			
TROY 115kV	OOS	**2.0 s**			OOS	**2.0 s**			
BF: 4122 Bell-Taft, Hot Springs-Taft 3P (BELL-TAFT @ TAFT)									
Out of Step Generator									
HUNGHR12 14kV	OOS	**2.1 s**	OOS	**2.3 s**	OOS	**2.3 s**			
LIB 01 14kV	OOS	**2.0 s**			OOS	**2.2 s**			BPA Issue
LIB 02 14kV	OOS	**2.0 s**			OOS	**2.2 s**			
LIB 03 14kV	OOS	**2.0 s**			OOS	**2.2 s**			
LIB 04 14kV	OOS	**2.0 s**			OOS	**2.2 s**			
LIB 05 14kV	OOS	**2.0 s**			OOS	**2.2 s**			
TROY 115kV	OOS	**2.1 s**			OOS	**2.3 s**			
BF: R336 Noxon 230 kV, Lancaster - Noxon 230 kV SLG (LANC-NRS @NRS)									
Out of Step Generator									
HUNGHR12 14kV	OOS	**2.2 s**			OOS	**2.2 s**			
LIB 01 14kV	OOS	**1.9 s**			OOS	**1.9 s**			
LIB 02 14kV	OOS	**1.9 s**			OOS	**1.9 s**			
LIB 03 14kV	OOS	**1.9 s**			OOS	**1.9 s**			
LIB 04 14kV	OOS	**1.9 s**			OOS	**1.9 s**			
LIB 05 14kV	OOS	**1.9 s**			OOS	**1.9 s**			Noxon Station Rebuild
TROY 115kV	OOS	**2.0 s**			OOS	**2.0 s**			
WECC Category C Voltage Dip Any Bus									
BONNERS 115kV	**-52.8 %**				**-51.3 %**				
COL FALL 115kV	**-70.0 %**				**-69.8 %**				
COL FALL E 230kV	**-75.1 %**				**-75.1 %**				
COL FALL W 230kV	**-75.1 %**				**-75.1 %**				
CONKELLY 230kV	**-77.0 %**				**-76.9 %**				

Row Labels	Column Labels 16LS Max of Voltage Dip or Frequency	16LS Max of Duration or Time	16LW Max of Voltage Dip or Frequency	16LW Max of Duration or Time	20LSPROJECTS Max of Voltage Dip or Frequency	20LSPROJECTS Max of Duration or Time	20LWPROJECTS Max of Voltage Dip or Frequency	20LWPROJECTS Max of Duration or Time
DUFORT 115kV	-32.7 %				-31.5 %			
ELMO 115kV	-32.5 %				-32.5 %			
EUREKA T 115kV	-70.2 %				-70.1 %			
FLATHEAD 230kV	-63.0 %				-62.9 %			
HASKILL 230kV	-88.3 %				-88.4 %			
HUNGHR12 13.8kV	-89.9 %				-90.0 %			
HUNGHR34 13.8kV	-76.4 %				-76.3 %			
HUNGRY H 230kV	-76.4 %				-76.3 %			
KALISPEL 115kV	-58.8 %				-58.8 %			
LAKESD F 230kV	-47.2 %				-47.2 %			
LIB 01 13.8kV	-35.3 %				-35.5 %			
LIB 02 13.8kV	-35.2 %				-35.3 %			
LIB 03 13.8kV	-35.1 %				-35.3 %			
LIB 04 13.8kV	-35.1 %				-35.2 %			
LIB 05 13.8kV	-32.4 %				-32.5 %			
LIB 06 13.8kV	-48.2 %				-48.4 %			
LIB PH1 230kV	-46.0 %				-46.2 %			
LIB PH2 230kV	-45.7 %				-45.9 %			
LIB TX1 100kV	-50.6 %				-50.8 %			
LIB TX2 100kV	-50.5 %				-50.7 %			
LIB TX3 100kV	-48.2 %				-48.4 %			
LIBBY 115kV	-59.3 %				-59.7 %			
LIBBY 230kV	-46.7 %				-46.8 %			
LIBBYFEC 115kV	-77.2 %				-77.9 %			
LION MTN 230kV	-51.5 %				-51.5 %			
MOYIE T 115kV	-62.2 %				-60.8 %			
MOYIE TX 115kV	-62.1 %				-60.7 %			
MT HALL 115kV	-51.8 %				-50.0 %			
N BENCH 115kV	-62.1 %				-60.7 %			

Row Labels	Column Labels 16LS Max of Voltage Dip or Frequency	16LS Max of Duration or Time	16LW Max of Voltage Dip or Frequency	16LW Max of Duration or Time	20LSPROJECTS Max of Voltage Dip or Frequency	20LSPROJECTS Max of Duration or Time	20LWPROJECTS Max of Voltage Dip or Frequency	20LWPROJECTS Max of Duration or Time	
SAGLE 115kV	-32.7 %				-31.5 %				
SAMUELS 115kV	-40.2 %				-38.6 %				
SAND CRK 115kV	-35.5 %				-33.8 %				
SAND TP 115kV	-33.1 %				-31.9 %				
SANDPONT 115kV	-32.7 %				-31.5 %				
SELLE 115kV	-36.4 %				-34.8 %				
SMITHFLS 115kV	-50.4 %				-48.5 %				
SMITHFLS 13.8kV	-45.9 %				-43.8 %				
STILLWTR 115kV	-70.1 %				-70.0 %				
TREGO 115kV	-70.1 %				-70.0 %				
TROY 115kV	-98.7 %				-98.3 %				
TRUMB CR 230kV	-83.5 %				-83.3 %				
YAAK 115kV	-80.4 %				-79.2 %				
P6									
N-2: Conkelley - Libby 230 kV and Libby - Noxon 230 kV 3P									
Out of Step Generator									
LIB 01 14kV			OOS	1.6 s			OOS	1.6 s	
TROY 115kV			OOS	4.9 s			OOS	5.0 s	
WECC Category C Voltage Dip Any Bus									
BONNERS 115kV			-34.6 %				-33.6 %		
LIB 01 13.8kV			-66.8 %				-67.2 %		
LIB 02 13.8kV			-84.9 %				-85.5 %		
LIB 03 13.8kV			-82.6 %				-83.2 %		Noxon Station rebuild
LIB 04 13.8kV			-82.6 %				-83.2 %		
LIB 05 13.8kV			-82.6 %				-83.2 %		
LIB 06 13.8kV			-82.6 %				-83.2 %		
LIB PH1 230kV			-82.2 %				-82.9 %		
LIB PH2 230kV			-82.6 %				-83.2 %		
LIB TX1 100kV			-84.9 %				-85.5 %		
LIB TX2 100kV			-82.6 %				-83.2 %		
LIB TX3 100kV			-82.6				-83.2		

Row Labels	Column Labels 16LS Max of Voltage Dip or Frequency	Max of Duration or Time	16LW Max of Voltage Dip or Frequency	Max of Duration or Time	20LSPROJECTS Max of Voltage Dip or Frequency	Max of Duration or Time	20LWPROJECTS Max of Voltage Dip or Frequency	Max of Duration or Time
			%				%	
LIBBY 115kV			-93.2 %				-93.8 %	
LIBBY 230kV			-82.6 %				-83.2 %	
LIBBYFEC 115kV			-91.6 %				-90.9 %	
MOYIE T 115kV			-42.1 %				-41.1 %	
MOYIE TX 115kV			-41.9 %				-40.9 %	
MT HALL 115kV			-31.5 %				-30.6 %	
N BENCH 115kV			-41.9 %				-41.0 %	
SAMUELS 115kV			-30.1 %				-30.5 %	
SAND CRK 115kV			-30.0 %					
SELLE 115kV			-30.1 %				-30.1 %	
SMITHFLS 115kV			-32.0 %				-30.8 %	
SMITHFLS 13.8kV			-30.0 %				-30.0 %	
TROY 115kV			-72.6 %				-71.7 %	
YAAK 115kV			-56.7 %				-55.7 %	

5 LEWISTON/CLARKSTON AREA

5.1 Executive Summary

The Lewiston/Clarkston area transmission system performs substantially better than other areas but performance issues are present in the near term and long term planning horizons. The primary issue is the loss of two 230 kV transmission lines in the area. The remaining 115 kV system is inadequate to transfer power from Hatwai and/or Dry Creek stations to Lolo Station.

Constructing a new 230 kV transmission line between Hatwai and Lolo stations will improve the transmission system performance in the near and long term planning horizon. The addition of shunt reactors will also enhance the operational flexibility to maintain adequate voltage levels.

A list of the corrective action plans proposed for the Lewiston/Clarkston area is provided in Table III-10.

	Year Problem Starts	Construction Start	Construction End	Consequence	Risk Factor	Priority	Cost Estimate
2-Planned							
Lolo Transformer Replacement	Present			14	0.0094	0.1313	$1,000,000
North Lewiston Reactors	Present	2015	2016	200	0.7500	150.0000	$4,900,000
4-Conceptual							
Hatwai - Lolo #2 230 KV Transmission Line	Present	2017	2019	850	0.0094	7.9688	$8,025,000
South Lewiston Station Rebuild	2030	2015	2016	100	0.0006	0.0586	$1,400,000

TABLE III-10: LEWISTON/CLARKSTON CORRECTIVE ACTION PLANS.

Additional projects not categorized as corrective action plans are listed in Table III-11.

	Construction Start	Construction End	Cost Estimate
1-Completed			
10th & Stewart Station Rebuild			
Lewiston Mill Road Station			
North Lewiston Distribution Station Relocation			
2-Planned			
Clearwater Station Upgrade	2015	2016	$1,000,000
Grangeville Station Rebuild	2018	2019	$2,025,000
Kamiah Wood Station Rebuild	2017	2018	$1,300,000
Kooskia Transformer Replacement			
Pound Land Station Rebuild	2017	2018	$1,300,000
3-Needs Further Analysis			
Wheatland Station			$0

TABLE III-11: LEWISTON/CLARKSTON FURTHER SINGLE SYSTEM PROJECTS

5.2 System Description

The Avista Lewiston/Clarkston area is located primarily in the Asotin County in the state of Washington and the Clearwater, Idaho, Lewis and Nez Perce Counties in the state of Idaho. The geographic features, and therefore the characterization of the transmission system, throughout the Lewiston/Clarkston area vary greatly. The majority of the load served in the area can be categorized as rural, low density load with the exception of one large industrial customer. The transmission system consists of several major components: a 500 kV source at the BPA's Hatwai Station, a 230 kV backbone system, and the underlying 115 kV transmission lines which serve the local loads.

5.2.1 Area Transmission

Transmission Lines

The main 230 kV transmission lines in the Lewiston/Clarkston area are:

- Dry Creek – Lolo
- Dry Creek – North Lewiston
- Hatwai – Lolo
- Hatwai – North Lewiston

Transmission Sources

The main transmission sources that feed the load in the Lewiston/Clarkston area are:

- Dry Creek – Talbot (AVA/PAC)
- Dworshak 13.8/115 kV Transformer, 150 MVA (USBR)
- Hatwai 500/230 kV Transformer, 1,250 MVA (BPA)
- Hatwai – Moscow (AVA)
- Lolo – Oxbow (AVA/IPCO)
- North Lewiston – Shawnee (AVA)

Transmission Paths

The Western Electricity Coordinating Council (WECC) transfer path Idaho to Northwest (Path 14) borders the southern edge of the Lewiston/Clarkston area. Avista owns the following transmission facilities within the path

- Lolo – Oxbow 230 kV Transmission Line

The BPA, Idaho Power, and PacifiCorp own the remaining transmission facilities which comprise the Idaho to Northwest Path.

5.2.2 Area Generation

Non-Avista owned local generation facilities within the Lewiston/Clarkston area include the following:

Dworshak HED	Units 1 & 2 @ 103 MW	Army Corps of Engineers
	Unit 3 @ 252 MW	Army Corps of Engineers
Clearwater ST	Unit 1 @ 33.3 MW (black liquor)	Clearwater Paper Corp
	Unit 2 @ 50.0 MW (black liquor)	Clearwater Paper Corp

There are no active Generation Interconnection Requests within the Lewiston-Clarkston area (as of October 2015).

There are also numerous small hydro generators in the area; Idaho Water Resources with a 2.5 MW & 0.5 MW unit on an Ahsahka 24kV feeder, Jim Ford Hydro with three 0.4 MW units on the Weippe 13 kV feeder 1289 and John Day Creek Hydro with two 0.5 MW units on an Idaho County Light & Power REA feeder at East Grangeville.

5.3 Corrective Action Plans

5.3.1 Completed

North Lewiston Distribution Station Relocation

The distribution load at North Lewiston Station was previously connected to the South Lewiston Tap. A project was completed to relocate the distribution facilities to be within the North Lewiston Station property and electrically connected directly to the 115 kV bus.

Construction was completed in 2013.

Clearwater Station Upgrade

Several components of the Clearwater Station have been replaced due to their condition. The project included the addition of a 115 kV bus sectionalizing breaker and associated air switches on the section of bus between the two power transformers for better operational flexibility and restoration. The protective relays and associated communication system were upgraded to improve reliability of service.

Construction was completed in 2014.

Lewiston Mill Road Station

A new distribution station was constructed on the southern edge of the Clearwater Paper facility property. The station was integrated into the Clearwater – Lolo #2 115 kV Transmission Line. Two distribution feeders were constructed to serve the Idaho Forest Group facility. An additional distribution feeder was constructed to serve other Avista customers.

Construction was completed in 2014.

5.3.2 Planned

There are no Corrective Action Plans planned for the Lewiston/Clarkston area.

5.3.3 Need Further Analysis

The following sections describe system deficiencies assuming completion of the planned projects as described above.

230 kV Voltage Control

There is an ongoing issue with high voltage on the 230 kV transmission system in the Lewiston/Clarkston area. The high voltage problem is persistent most months of the year (the exception is heavy summer loading months) and the high voltage peaks during the overnight hours. The high voltage condition is a result of the expansion of Avista's 230 kV transmission network. Although there are many benefits to a large networked transmission system, one negative outcome is that long, lightly loaded transmission lines produce large amounts of line charging current (leading reactive MVAr), increasing system voltage. Presently, there is no practical way to correct the high voltage issue with the existing 230 kV transmission system beyond taking lines out of service. A plan has been developed to install two 50 MVAr switchable reactors at one of the 230 kV stations in the area.

5.3.4 Conceptual

Hatwai – Lolo #2 230 kV Transmission Line

Project Scope/Description

A second 230 kV transmission line from Hatwai to Lolo has been proposed. Presently, the outage of the Hatwai – Lolo 230 kV Transmission Line followed by a second 230 kV transmission line outage in the Lewiston/Clarkston area requires the back tripping of the Lolo – Oxbow 230 kV Transmission Line. The back tripping scheme is insufficient for relieving the thermal overload on the Clearwater – North Lewiston 115 kV Transmission Line.

The loss of both the Hatwai – Lolo and Dry Creek – North Lewiston 230 kV transmission lines causes thermal overloads on the Clearwater – North Lewiston and Dry Creek – North Lewiston 115 kV transmission lines (see Figure III-8). There is an existing operational scheme to have the Lolo – Oxbow 230 kV Transmission Line trip when a second 230 kV transmission line is tripped in the Lewiston/Clarkston area. The back tripping scheme is insufficient for relieving the thermal overload on the Clearwater – North Lewiston 115 kV Transmission Line. The construction of a second Hatwai – Lolo 230 kV transmission line will mitigate the observed performance issues.

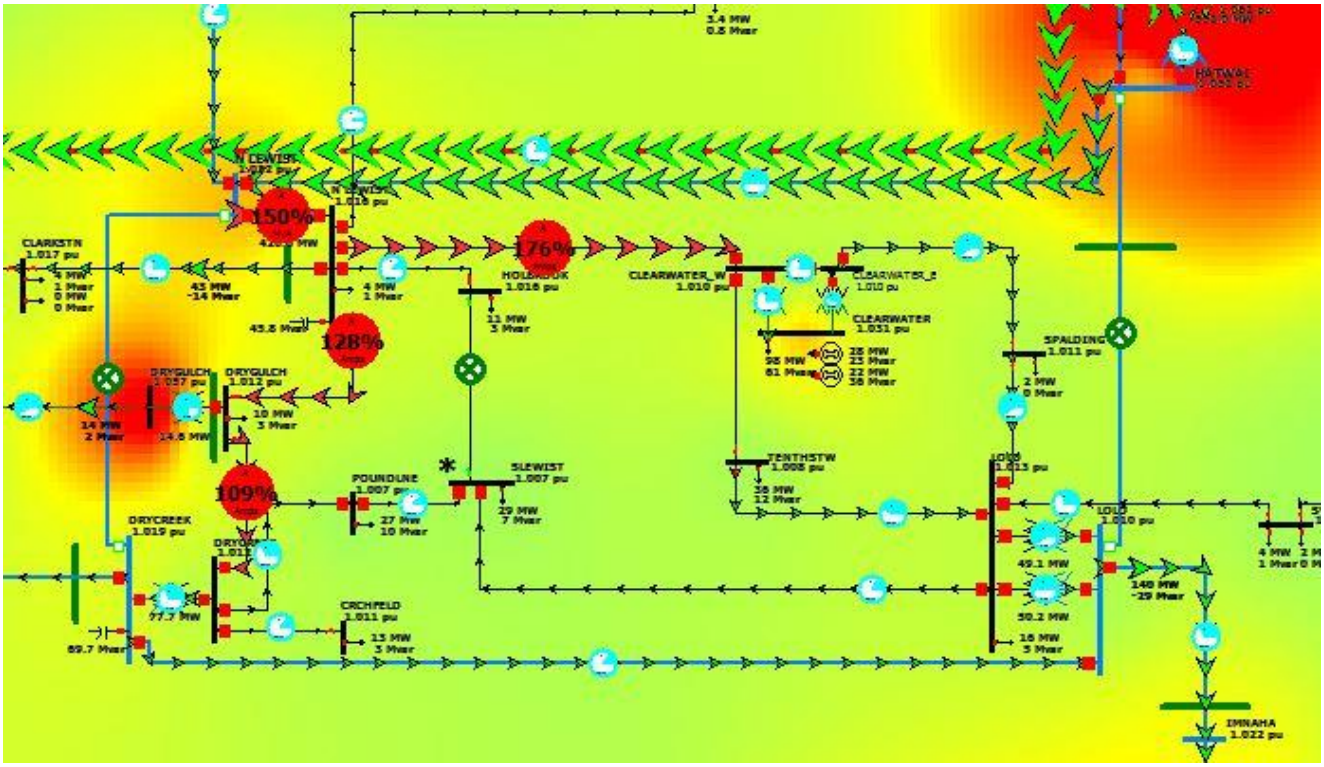


FIGURE III-8: N-1: DRY CREEK - NORTH LEWISTON 230 KV + N-1: HATWAI - LOLO 230 KV IN 25HS

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 heavy summer.

Performance Criteria Violations

Row Labels	16HS	20HS	25HS	35HS
P6				
N-1: Dry Creek - Lolo 230 kV + N-1: Hatwai - Lolo 230 kV				
LOLO (48197)	1.0073		1.0095	1.0078
N LEWIST (48253) -> CLEARWATER_W (48075) CKT 1	150.8 %	145.1 %	146.3 %	149.0 %
N-1: Dry Creek - North Lewiston 230 kV + N-1: Hatwai - Lolo 230 kV				
N LEWIST (48253) -> CLEARWATER_W (48075) CKT 1		162.3 %	163.3 %	165.5 %
N LEWIST (48253) -> DRYGULCH (48113) CKT 1		129.0 %	129.3 %	130.1 %
N LEWIST (48255) -> N LEWIST (48253) CKT 1		299.8 %	300.6 %	302.4 %
DRYGULCH (48113) -> DRYCREEK (48510) CKT 1		110.4 %	110.4 %	110.7 %
N-1: Hatwai - Lolo 230 kV + T-1: North Lewiston 230/115 kV				
N LEWIST (48255) -> DRYCREEK (48512) CKT 1	101.9 %	106.0 %	106.3 %	106.8 %

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

Lolo Transformer Replacement

Project Scope/Description

The Lolo #1 & #2 230/115 kV transformers are proposed to be replaced with 125 MVA minimum nominal MVA capacity. Lolo #1 230/115 kV Transformer overloads for an outage of both the Dry Creek and North Lewiston 230/115 kV transformers. The Lolo transformers have been identified by Asset Management for replaced due to age and condition.

An outage of both the Dry Creek and North Lewiston 230/115 kV transformers will overload the Lolo #1 230/115 kV Transformer (see Figure III-9). Replacing the existing Lolo transformers with 125 MVA or larger nominally rated transformers will mitigate the observed performance issues. The Lolo transformers have also been identified by Asset Management for replacement.

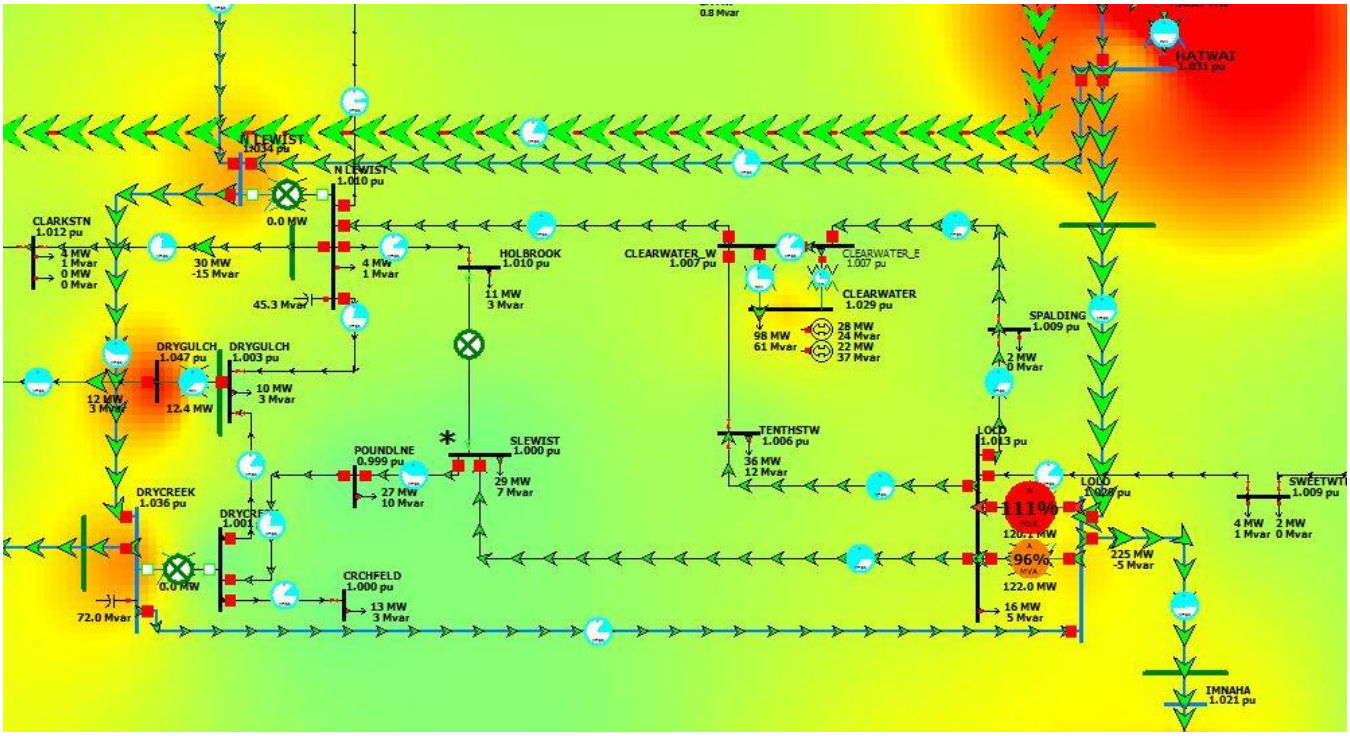


FIGURE III-9: N-1: DRY CREEK 230/115 KV + N-1: NORTH LEWISTON 230/115 KV IN 25HS

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2020 heavy summer.

Performance Criteria Violations

Row Labels	16HS	20HS	25HS	35HS
P6				
N-1: Dry Creek 230/115 kV + T-1: North Lewiston 230/115 kV				
LOLO (48197) -> LOLO (48195) CKT 1	**100.2 %**	**107.7 %**	**110.5 %**	**116.4 %**
LOLO (48197) -> LOLO (48195) CKT 2				**100.7 %**

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

South Lewiston Station

Reconstruction of the South Lewiston Station is planned to address equipment aging and condition. The South Lewiston 115/13.8 kV Transformer is one of three remaining high loss transformers on Avista's system. Additional property to the north is being investigated for a complete rebuild of the station. An analysis of the future distribution capacity requirements has not been completed. Expansion of the South Lewiston Station may provide for deferral of expansion at the Holbrook Station. The existing station site is not a good location between the river and Snake River Drive.

The addition of circuit breakers at South Lewiston Station will allow the transmission system in the Lewiston/Clarkston area to be more tightly networked. The present South Lewiston Tap would be capable of operating normally closed creating a North Lewiston – South Lewiston 115 kV Transmission Line. Full scope of the project needs to be evaluated. The primary benefit of adding circuit breakers to South Lewiston Station is increased operational flexibility during planned or forced transmission outages.

5.3.5 New Proposals

There are no new proposed Corrective Action Plans planned for the Lewiston-Clarkston area.

5.4 Single System Projects (non-corrective action plans)

5.4.1 10th & Stewart Station Rebuild

Several facilities within the 10th & Stewart Station are desired to be replaced. 10th & Stewart #1 115/13.8 kV Transformer and the associated 115 kV circuit switcher will be replaced. Additional plans include replacing the feeder breakers and upgrading the SCADA. The station will be near physical space capacity with two 30 MVA transformers and five feeders. Adequate space will remain for an additional 13 kV feeder.

The station rebuild is intended to not impede the future addition of 115 kV circuit breakers to the station. Load growth in the area south of the 10th & Stewart Station may drive the need for a new distribution station intregrated into the Clearwater – Lolo #2 115 kV Transmission Line. The addition of circuit breaker at 10th & Stewart Station will reduce the exposure of three stations connected to the same transmission line.

5.4.2 Grangeville Station Rebuild

The Grangeville Station was expanded in 2011 to install a 115 kV capacitor bank. The new yard allows for expansion of the station. There are plans to replace the 115 kV fuses with a circuit switcher, which requires relaying and a panelhouse. The planned work lends itself to a staged rebuild. There are presently four transformers in the station – two 115/13 kV (20 and 9.37 MVA) and two 13/34 kV (2.5 MVA each) – that could be consolidated and standardized in the rebuilt station. Further analysis of the benefits to adding circuit breakers allowing for operating the Nez Perce – Grangeville #1 & #2 115 kV transmission lines closed should be considered.

5.4.3 Pound Lane Station Rebuild

The Pound Lane Station is planned to be rebuilt due to condition of the station.

5.4.4 Kamiah Wood Station Rebuild

The Kamiah Station is presently a wood station. The station is one of the top three stations planned for rebuild in the next five years. Investigation of expansion possibilities or full scope of the rebuild has not been conducted.

5.4.5 Wheatland Station

A new distribution station located in the eastern area of Lewiston has been proposed. The new station has been named Wheatland Station. Integration with the Transmission System has not been determined.

5.4.6 Kooskia Transformer Replacement

The transformer at Kooskia Station is one of the top three lossiest transformers on our system, it is scheduled for replacement in the future. A circuit switcher may be included in the replacement as well.

5.5 Spare Equipment Study

FACILITY RATING VIOLATIONS FROM THE SPARE EQUIPMENT STUDY ARE PROVIDED IN

Table III-12.

5.5.1 Dry Creek Transformer Failure

Failure of the Dry Creek 230/115 kV Transformer requiring complete replacement causes thermal overload of the Lolo #1 230/115 kV Transformer when a subsequent outage of the North Lewiston 230/115 kV Transformer occurs.

The observed issues with the loss of the Dry Creek 230/115 kV Transformer will be mitigated by replacing the existing Lolo transformers with 125 MVA or larger nominally rated transformers. The Lolo transformers have also been identified by Asset Management for replacement.

5.5.2 North Lewiston Transformer Failure

Failure of the North Lewiston 230/115 kV Transformer requiring complete replacement causes thermal overloads on the Dry Creek – North Lewiston 115 kV Transmission Line when a subsequent bus outage or breaker failure occurs at Lolo Station.

Modification of the Lolo 115 kV bus to prevent loss of both Lolo transformers for a bus outage will mitigate the observed issues.

5.5.3 Hatwai Transformer

Failure of the Hatwai 500/230 kV Transformer requiring complete replacement causes thermal overloads on the Benewah – Boulder 230 kV Transmission Line when a subsequent outage takes the Benewah – Pine Creek 230 kV Transmission Line out of service.

The BPA is capable of restoring the Hatwai 500/230 kV Transformer in less than one year with the ability to energize a spare single phase transformer located at Hatwai Station. Establishing a second north-south path from the Spokane area will mitigate the observed issues. A Garden Springs – Thornton 230 kV Transmission Line is proposed as an alternative for further evaluation.

5.5.4 Dworshak Transformer

Failure of the Dworshak 230/115 kV Transformer requiring complete replacement causes thermal overloads on the Beacon Transformer or Westside Transformer when a subsequent outage takes a bus out at Beacon Station.

Projects in the Spokane area will mitigate the observed issues.

Row Labels	DCR	DWOR	HAT	NLW
P1				
N-1: 3TM Brownlee - Quartz - LaGrande 230 kV				
SHAWNEE (48385)			1.0098	
N-1: Beacon - Ross Park 115 kV				
WEST (48463) -> WEST (48461) CKT 1 at WEST			100.1 %	
N-1: Cabinet - Rathdrum 230 kV				
MOSCOW (48249)			1.0096	
SHAWNEE (48385)			1.0087	
THORNTON (48432)			1.0092	
N-1: Dry Creek 230/115 kV				
LOLO (48197) -> LOLO (48195) CKT 1 at LOLO				107.7 %
N-1: Dworshak - Hatwai 500 kV				
BENEWAH (48037)		1.0079		
MOSCOW (48249)			1.0001	
PALOUSE_WIND (48863)			1.0024	
SHAWNEE (48385)			0.9996	
THORNTON (48432)			1.0008	
N-1: Dworshak - Taft 500 kV				
MOSCOW (48249)			1	
PALOUSE_WIND (48863)			1.0025	
SHAWNEE (48385)			0.9995	
THORNTON (48432)			1.0009	
N-1: Hatwai - Lower Granite 500 kV				
MOSCOW (48249)			1.0007	
PALOUSE_WIND (48863)			1.0031	
SHAWNEE (48385)			1.0002	
THORNTON (48432)			1.0015	
N-1: Moscow 230 - South Pullman 115 kV (M23-SPU)				
SHAWNEE (48385)			1.01	
N-1: North Lewiston - Shawnee 230 kV				
MOSCOW (48249)			1.0074	
PALOUSE_WIND (48863)			1.0089	
SHAWNEE (48385)			0.9985	
THORNTON (48432)			1.0074	
N-1: Shawnee - Terre View 115 kV (SHN-TUR)				
MOSCOW (48249)			1.0095	
P2				
BF: 4028 Dworshak-Taft, Taft 500 kV Switched Shunt				
MOSCOW (48249)			1	
PALOUSE_WIND (48863)			1.0025	
SHAWNEE (48385)			0.9995	
THORNTON (48432)			1.0009	
BF: 4111 Dworshak-Taft, Hot Springs-Taft				
MOSCOW (48249)			1.0002	
PALOUSE_WIND (48863)			1.0027	
SHAWNEE (48385)			0.9997	
THORNTON (48432)			1.0011	
BF: 4122 Bell-Taft, Hot Springs-Taft				
MOSCOW (48249)			1.0087	
PALOUSE_WIND (48863)			1.0097	
SHAWNEE (48385)			1.0079	
THORNTON (48432)			1.0083	
BF: 4148 Garrison-Taft #2, Hot Springs-Taft				
MOSCOW (48249)			1.0073	
PALOUSE_WIND (48863)			1.0085	
SHAWNEE (48385)			1.0065	
THORNTON (48432)			1.0071	
BF: 4652 Dworshak-Taft, Dworshak-Hatwai, Dworshak 500 kV Switched Shunt				
BENEWAH (48037)		1.0078		1.01
MOSCOW (48249)			1.0001	
PALOUSE_WIND (48863)			1.0024	
SHAWNEE (48385)			0.9996	
THORNTON (48432)			1.0008	

Row Labels	DCR	DWOR	HAT	NLW
BF: 4656 Dworshak-Taft, Dworshak Gen				
BENEWAH (48037)		1.0099		
MOSCOW (48249)			0.9995	
PALOUSE_WIND (48863)			1.002	
SHAWNEE (48385)			0.999	
THORNTON (48432)			1.0003	
BF: 4700 Dworshak-Hatwai, Hatwai 500/230 kV Transformer				
HATWAI (40519)				1.0077
MOSCOW (48249)			1.0001	
PALOUSE_WIND (48863)			1.0024	
SHAWNEE (48385)			0.9996	
THORNTON (48432)			1.0008	
BF: 4708 Hatwai-Lower Granite, Dworshak-Hatwai				
MOSCOW (48249)			1	
PALOUSE_WIND (48863)			1.0023	
SHAWNEE (48385)			0.9994	
THORNTON (48432)			1.0007	
BF: 4710 Hatwai-Lower Granite, Hatwai 500/230 kV Transformer				
HATWAI (40519)	1.0098			1.0084
MOSCOW (48249)			1.0007	
PALOUSE_WIND (48863)			1.0031	
SHAWNEE (48385)			1.0002	
THORNTON (48432)			1.0015	
BF: A261 Lolo 115 kV, Lolo-Poundlane				
DRYCREEK (48510) -> DRYGULCH (48113) CKT 1 at DRYCREEK				**139.1 %**
DRYGULCH (48113) -> N LEWIST (48253) CKT 1 at DRYGULCH				**120.3 %**
BF: A263 Lolo 115 kV, Clearwater-Lolo #1				
DRYCREEK (48510) -> DRYGULCH (48113) CKT 1 at DRYCREEK				**135.9 %**
DRYGULCH (48113) -> N LEWIST (48253) CKT 1 at DRYGULCH				**117.5 %**
BF: A265 Lolo 115 kV, Lolo-Nez Perce				
DRYCREEK (48510) -> DRYGULCH (48113) CKT 1 at DRYCREEK				**137.6 %**
DRYGULCH (48113) -> N LEWIST (48253) CKT 1 at DRYGULCH				**119.2 %**
BF: A286 Hot Springs 230 kV, Flathead-Hot Springs				
MOSCOW (48249)			1.0005	
PALOUSE_WIND (48863)			1.0022	
SHAWNEE (48385)			0.9999	
THORNTON (48432)			1.0006	
BF: A288 Hot Springs 230 kV, Hot Springs-Noxon Rapids #1				
MOSCOW (48249)			1.0022	
PALOUSE_WIND (48863)			1.0038	
SHAWNEE (48385)			1.0015	
THORNTON (48432)			1.0022	
BF: A290 Hot Springs 230 kV, Hot Springs-Rattlesnake				
MOSCOW (48249)			1.0039	
PALOUSE_WIND (48863)			1.0053	
SHAWNEE (48385)			1.0032	
THORNTON (48432)			1.0038	
BF: A370 Bell S1 & S2 230 kV				
BOULDER (48524)			1.0081	
MOSCOW (48249)			1.0052	
PALOUSE_WIND (48863)			1.0052	
SHAWNEE (48385)			1.0043	
THORNTON (48432)			1.0036	
BF: A445 Lolo 115 kV, Clearwater-Lolo #2				
DRYCREEK (48510) -> DRYGULCH (48113) CKT 1 at DRYCREEK				**107.1 %**
BF: A505 Rathdrum East 115 kV, Coeur d'Alene 15th St-Rathdrum				
SHAWNEE (48385)			1.0098	
BF: A521 Devils Gap East 115 kV, Addy-Devils Gap				
WEST (48463) -> WEST (48461) CKT 1 at WEST			**106.6 %**	
BF: A526 Devils Gap East 115 kV, Airway Heights-Devils Gap				
WEST (48463) -> WEST (48461) CKT 1 at WEST			**104.9 %**	
BF: A540 Devil's Gap East & West 115 kV				
WEST (48463) -> WEST (48461) CKT 1 at WEST			**106.8 %**	

Row Labels	DCR	DWOR	HAT	NLW
BF: A572 Bell S3 230 kV, Bell-Boundary #3				
WEST (48463) -> WEST (48461) CKT 1 at WEST			102.9 %	
BF: A583 North Lewiston 115 kV,Dry Creek-North Lewiston				
HATWAI (40519)			1.007	
LOLO (48197)			1.007	
MOSCOW (48249)			1.0019	
PALOUSE_WIND (48863)			1.0081	
SHAWNEE (48385)			1.0015	
THORNTON (48432)			1.0067	
BF: A586 North Lewiston 115 kV, North Lewiston-Tucannon River				
HATWAI (40519)			1.0052	
LOLO (48197)			1.0052	
MOSCOW (48249)			1	
PALOUSE_WIND (48863)			1.0067	
SHAWNEE (48385)			0.9998	
THORNTON (48432)			1.0052	
BF: A604 Beacon North 115 kV, Beacon-Boulder #1				
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2 at NINTHCNT_N			108.1 %	
WEST (48463) -> WEST (48461) CKT 1 at WEST			115.4 %	
BF: A632 Shawnee 115 kV, Shawnee-Terre View				
MOSCOW (48249)			1.0065	
BF: A634 Shawnee 115 kV, Shawnee-South Pullman				
MOSCOW (48249)			1.0064	
BF: A688 Ninth & Central North & South 115 kV				
ROSSPARK (48371) -> THIRHACH (48431) CKT 1 at ROSSPARK			110.9 %	
BF: A717 Boulder East & West 115 kV				
WEST (48463) -> WEST (48461) CKT 1 at WEST			102.6 %	
BF: A845 Moscow-Terre View, Moscow 230/115 kV Transformer				
SHAWNEE (48385)			1.0097	
BF: R387 Lolo-Oxbow, Lolo #2 230/115 Transformer				
LOLO (48197) -> LOLO (48195) CKT 1 at LOLO				106.4 %
BF: R404 Cabinet-Rathdrum, Rathdrum #2 230/115 Transformer				
MOSCOW (48249)			1.0094	
SHAWNEE (48385)			1.0085	
THORNTON (48432)			1.009	
BF: R504 Cabinet-Rathdrum, Rathdrum #1 230/115 Transformer				
MOSCOW (48249)			1.0095	
SHAWNEE (48385)			1.0086	
THORNTON (48432)			1.0091	
BF: R615 Dry Creek 230 kV Switched Shunt, Dry Creek 230/115 Transformer				
HATWAI (40519)			0.9975	
LOLO (48197)			0.9975	
LOLO (48197) -> LOLO (48195) CKT 1 at LOLO				107.2 %
MOSCOW (48249)			0.9929	
PALOUSE_WIND (48863)			1.0012	
SHAWNEE (48385)			0.9929	
THORNTON (48432)			0.9995	
BF: R617 Dry Creek-North Lewiston, Dry Creek 230/115 Transformer				
LOLO (48197) -> LOLO (48195) CKT 1 at LOLO				105.5 %
MOSCOW (48249)			1.0091	
SHAWNEE (48385)			1.0072	
THORNTON (48432)			1.0099	
BF: R621 Dry Creek-Talbot, Dry Creek 230/115 Transformer				
LOLO (48197) -> LOLO (48195) CKT 1 at LOLO				113.7 %
MOSCOW (48249)			1.0058	
PALOUSE_WIND (48863)			1.0099	
SHAWNEE (48385)			1.0052	
THORNTON (48432)			1.0085	
BF: R625 Dry Creek-Lolo, Dry Creek 230/115 Transformer				
LOLO (48197) -> LOLO (48195) CKT 1 at LOLO				106.1 %
MOSCOW (48249)			1.0098	
BUS: Beacon North 115 kV				
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2 at NINTHCNT_N			108.7 %	

Row Labels	DCR	DWOR	HAT	NLW
WEST (48463) -> WEST (48461) CKT 1 at WEST			116.5 %	
BUS: Beacon North 230 kV				
SHAWNEE (48385)			1.0098	
WEST (48463) -> WEST (48461) CKT 1 at WEST		100.0 %	106.7 %	
BUS: Beacon South 115 kV				
WEST (48463) -> WEST (48461) CKT 1 at WEST			102.3 %	
BUS: Beacon South 230 kV				
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		100.1 %	106.8 %	
WEST (48463) -> WEST (48461) CKT 1 at WEST			109.1 %	
BUS: Bell S2 230 kV				
MOSCOW (48249)			1.009	
PALOUSE_WIND (48863)			1.0096	
SHAWNEE (48385)			1.0081	
THORNTON (48432)			1.0082	
WEST (48463) -> WEST (48461) CKT 1 at WEST			101.8 %	
BUS: Bell S3 230 kV				
WEST (48463) -> WEST (48461) CKT 1 at WEST			102.8 %	
BUS: Devils Gap East 115 kV				
WEST (48463) -> WEST (48461) CKT 1 at WEST			106.8 %	
BUS: Dry Creek 115 kV				
LOLO (48197) -> LOLO (48195) CKT 1 at LOLO				102.5 %
BUS: Hatwai 230 kV				
BENEWAH (48037)		0.9972		
MOSCOW (48249)		0.9793	1.0035	
PALOUSE_WIND (48863)		1.0052		
SHAWNEE (48385)		1.0069	1.0061	
STMARIES (48417)	0.9498	0.9425		0.9499
THORNTON (48432)	1.0099	1.0037	1.0088	1.0093
BUS: Hot Springs 230 kV				
MOSCOW (48249)			1.0024	
PALOUSE_WIND (48863)			1.004	
SHAWNEE (48385)			1.0018	
THORNTON (48432)			1.0025	
BUS: Lolo 115 kV				
DRYCREEK (48510) -> DRYGULCH (48113) CKT 1 at DRYCREEK				137.6 %
DRYGULCH (48113) -> N LEWIST (48253) CKT 1 at DRYGULCH				119.1 %
BUS: Long Lake 115 kV				
WEST (48463) -> WEST (48461) CKT 1 at WEST			100.2 %	
BUS: North Lewiston 115 kV				
HATWAI (40519)			1.0051	
LOLO (48197)			1.0051	
MOSCOW (48249)			0.9999	
PALOUSE_WIND (48863)			1.0066	
SHAWNEE (48385)			0.9997	
THORNTON (48432)			1.0051	
BUS: North Lewiston 230 kV				
LOLO (48197) -> LOLO (48195) CKT 1 at LOLO	104.7 %			
MOSCOW (48249)			1.0015	
PALOUSE_WIND (48863)			1.0071	
SHAWNEE (48385)			0.9959	
THORNTON (48432)			1.0057	
BUS: Shawnee 115 kV				
MOSCOW (48249)			1.0065	
BUS: Shawnee 230 kV				
DIAMOND (48109)			0.9496	
EWAN (48121)			0.9448	
HATWAI (40519)			1.0082	
MOSCOW (48249)			0.9882	
N-1: Cabinet - Rathdrum 230 kV Open @ CAB				
MOSCOW (48249)			1.0099	
SHAWNEE (48385)			1.009	
THORNTON (48432)			1.0095	
N-1: Cabinet - Rathdrum 230 kV Open @ RAT				

Row Labels	DCR	DWOR	HAT	NLW
MOSCOW (48249)			1.0098	
SHAWNEE (48385)			1.0089	
THORNTON (48432)			1.0095	
N-1: Moscow 230 - South Pullman 115 kV Open @ M23				
SHAWNEE (48385)			1.0075	
N-1: Moscow 230 - Terre View 115 kV Open @ M23				
SHAWNEE (48385)			1.0092	

TABLE III-12: LEWISTON/CLARKSTON SPARE EQUIPMENT CONTINGENCY ANALYSIS RESULTS.

5.7 Voltage Stability Study

A Load Ramp PV Curve analysis was conducted while monitoring all buses in the Lewiston/Clarkston area. All loads within the Lewiston/Clarkston area were increased until voltage collapse occurred. All additional generation necessary to supply the increase in load came from a distribution of all generation in WECC except those within the Lewiston/Clarkston area.

The theoretical flow limit is 1250 MW for all lines in service condition. The critical bus under all lines in service condition is East Grangeville Station. As load increases in the Lewiston/Clarkston area, the limiting contingency is the bus outage of the Hatwai 230 kV with total area load of 790 MW (see Figure III-10). The bus outage of the Orofino 115 kV has a more limiting total area load of 780 MW.

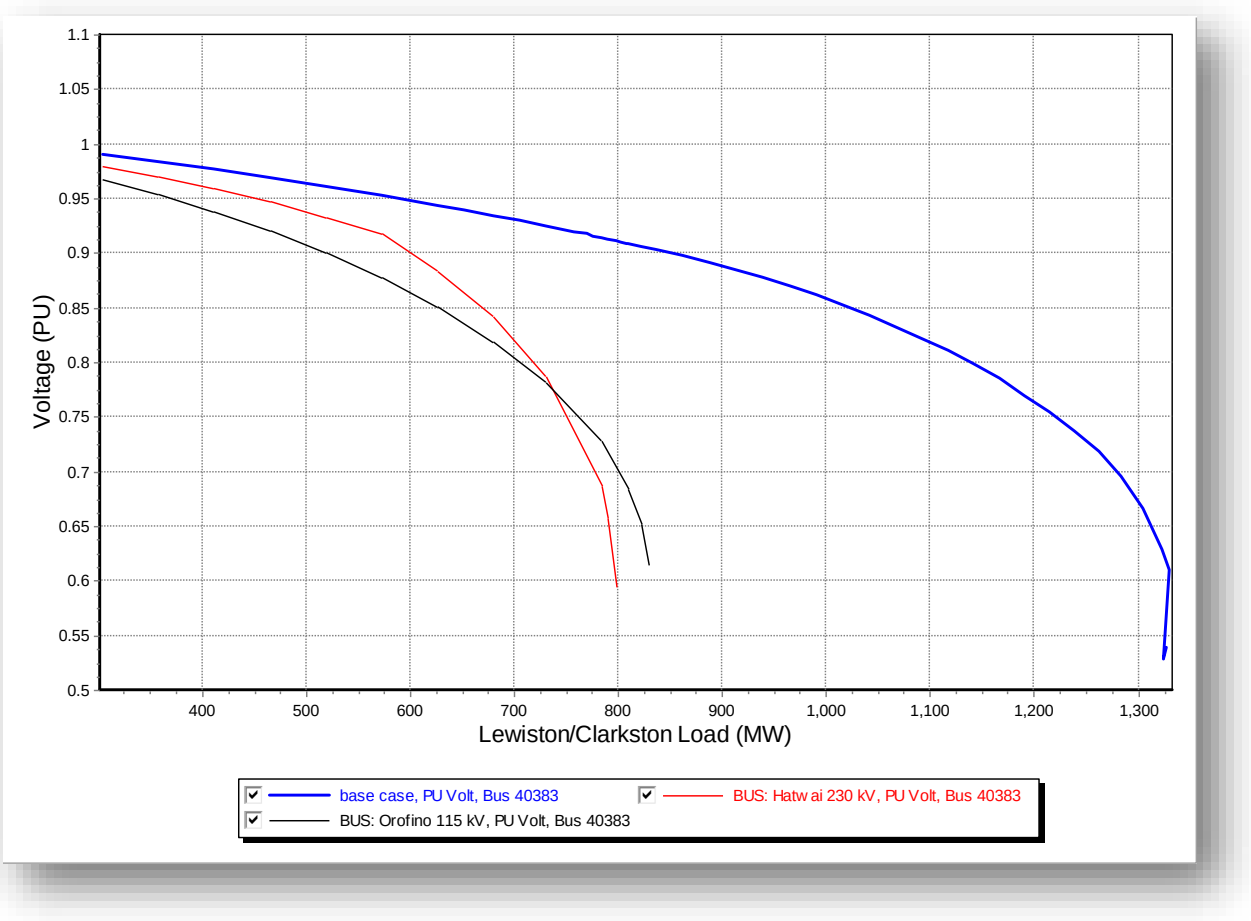


FIGURE III-10: LEWISTON/CLARKSTON LOAD RAMP PV CURVE RESULTS – EXISTING SYSTEM

The load ramp PV curve analysis was repeated with the assumption that all planned corrective action plans listed above are constructed. The performance of the area transmission system is not improved as no projects are planned for construction which impact how the Lewiston/Clarkston transmission system functions.

5.8 Stability Study Results

Heavy Summer Scenario

Row Labels	16HS Max of Voltage Dip or Frequency	Max of Duration or Time	20HSPROJECTS Max of Voltage Dip or Frequency	Max of Duration or Time	25HSPROJECTS Max of Voltage Dip or Frequency	Max of Duration or Time	
P4							
BF: A217 Clearwater West 115 kV, Clearwater - North Lewiston 115 kV 3P (CLW-NLW @NLW)							
Out of Step Generator							
CWGEN3 12kV	OOS	1.7 s	OOS	1.7 s	OOS	1.7 s	Verify Models
WECC Category C Voltage Dip Any Bus							
CLEARWATER 34.5kV	-32.4 %		-32.3 %		-32.4 %		
CWGEN3 12kV	-36.1 %		-37.1 %		-37.0 %		

Results are the same in all scenarios

6 PALOUSE AREA

6.1 Executive Summary

The Palouse area transmission system demonstrated only one performance issue in the near term and long term planning horizons. The outage of both the Moscow and Shawnee 230/115 kV transformers potentially causes localized voltage collapse depending on the season and scenario. The issue exists in the present state of the system and worsens with time.

The addition of a third transformer near Pullman or Moscow will conceptually mitigate the issues caused by the loss of the two transformers. There is some existing operational flexibility to reduce the potential thermal and voltage violations but at the cost of consequential load loss following the second outage.

A list of the corrective action plans proposed for the Palouse area is provided in Table III-13.

	Year Problem Starts	Construction Start	Construction End	Consequence	Probability Factor	Priority	Cost Estimate
1-Completed							
Moscow 230 Station Rebuild						0.0100	
4-New Proposal							
Shawnee #2 230/115 kV Transformer	Present			1430	0.0750	107.2500	$2,500,000

TABLE III-13: PALOUSE CORRECTIVE ACTION PLANS

Additional projects not categorized as corrective action plans are listed in Table III-14.

	Construction Start	Construction End	Cost Estimate
1-Completed			
Diamond Station Minor Rebuild			
2-Planned			
Benewah - Moscow 230 kV Transmission Line Rebuild	2015	2017	$24,178,800
Moscow City 115 SCADA/Minor Rebuild			
North Moscow Transformation	2018	2019	$1,800,000
Potlatch Transformer Replacement			
Tekoa SCADA Upgrade/Minor Rebuild			
3-Needs Further Analysis			
Deary - Potlatch 115 kV Transmission Line			
Tamarack Station	2018	2019	$3,075,000

TABLE III-14: PALOUSE FURTHER SINGLE SYSTEM PROJECTS

6.2 System Description

The Avista Palouse area is located primarily in Spokane and Whitman counties in Washington and Latah County in Idaho. The majority of the load served in the area can be categorized as rural, low density load with the exception of the cities of Pullman, WA and Moscow, ID. The transmission system consists of a 230 kV backbone system and underlying 115 kV transmission lines that serve the local loads. The 230 kV transmission lines provide sources for the local area and North and South transfers across Avista's system.

The 115 kV transmission system in the Palouse area is primarily operated with normally open points referred to as "star points". A star point is used to minimize power flow to mitigate overloads on the 115 kV system in the event of an outage on the overlying 230 kV transmission system, as well as reducing overall system losses in the area. Operating in a "star" configuration also reduces exposure to loads served by long transmission lines. In the Palouse area, star points switches can be operated open or closed based on outages, specific flow conditions, or due to operational constraints.

6.2.1 Area Transmission

Transmission Lines

The main 230 kV transmission lines in the Palouse area are:

- Benewah – Thornton
- Shawnee-Thornton
- Benewah – Moscow
- Benewah – Pine Creek
- Benewah – Boulder
- Hatwai – Moscow
- North Lewiston – Shawnee 230 kV transmission lines

Transmission Sources

The main transmission sources that feed the load in the Palouse area are:

- Benewah
- Shawnee
- Moscow Stations

6.2.2 Area Generation

Non-Avista owned local generation facilities within the Palouse area include the following:

Palouse Wind

Avista signed a Power Purchase Agreement for First Wind's Palouse Wind Project in June 2011. The Palouse Wind Project (Project #17) is interconnected with Avista's Transmission System at the Thornton Station, and it provides Avista with approximately 40 average megawatts of renewable energy, or as much as 105 megawatts of nameplate wind capacity, under a 30-year power purchase agreement. Delivery began at the end of 2012. The energy qualifies under Washington State's Energy Independence Act (RCW 19.285) to meet Avista's Washington State-mandated renewable portfolio standard (RPS) requirements.

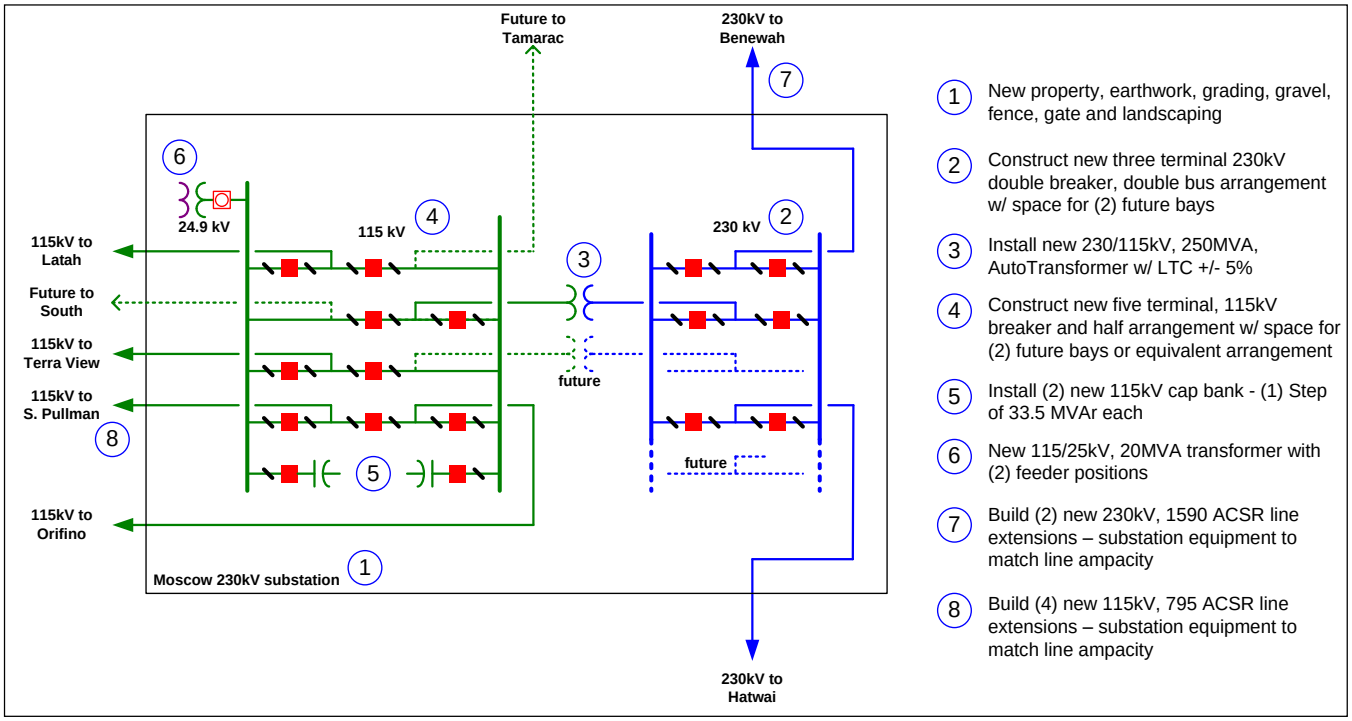
There are no active Generation Interconnection Requests within the Palouse area (as of October 2015).

6.3 Corrective Actions Plans

6.3.1 Completed

Moscow 230 Station Rebuild

The Moscow 230 Station has been completely rebuilt including the replacement of the 230/115 kV autotransformer with a 250 MVA nominal capacity transformer. The replacement of the transformer was identified for mitigating thermal overloads do to outages in the area including the outage of the Shawnee 230/115 kV Transformer. The Substation Engineering Department identified several issues with the station warranting a green field rebuild. The new station consists of double bus, double breaker 230 kV facility and breaker and a half 115 kV facility. The installation of two steps of 33.5 MVAr capacitor banks will be completed by the end of 2014.



6.3.2 Planned

There are no Corrective Action Plans planned for the Palouse area.

6.3.3 Need Further Analysis

The following sections describe system deficiencies assuming completion of the planned projects as described above.

230 kV Capacitor Automatic Switching

Project Scope/Description

A project has been proposed to implement automatic insertion of existing shunt capacitor banks at Benewah and Dry Creek Stations when voltage at the respective 230 kV busses drops below the present operating limit of 232.3 kV or rises above the present operating limit of 242 kV. Present automatic capacitor bank switching occurs when voltage drops below 228 kV. The lower voltage level of 228 kV allows for system operators to manually perform the appropriate mitigating actions. Allowing for tighter automatic control will prevent exceeding applicable facility ratings for various contingencies on the System.

Completion of the project will mitigate the performance issues within the ten year planning horizon.

6.3.4 Conceptual

Shawnee #2 230/115 kV Transformer

Project Scope/Description

The outage of both the Moscow and Shawnee 230/115 kV transformers causes potential voltage collapse in the Palouse area if there are no mitigating actions taken following the outage of the first transformer (see Figure III-11). System deficiencies are observed in all scenarios studied including light loading scenarios. The addition of a second 230/115 kV transformer at Shawnee Station will mitigate the observed deficiencies. Shawnee station is conceptually preferred over adding a second transformer at Moscow Station as it will also mitigate the outage of the Shawnee transformer and Moscow – Terre View 115 kV Transmission Line.

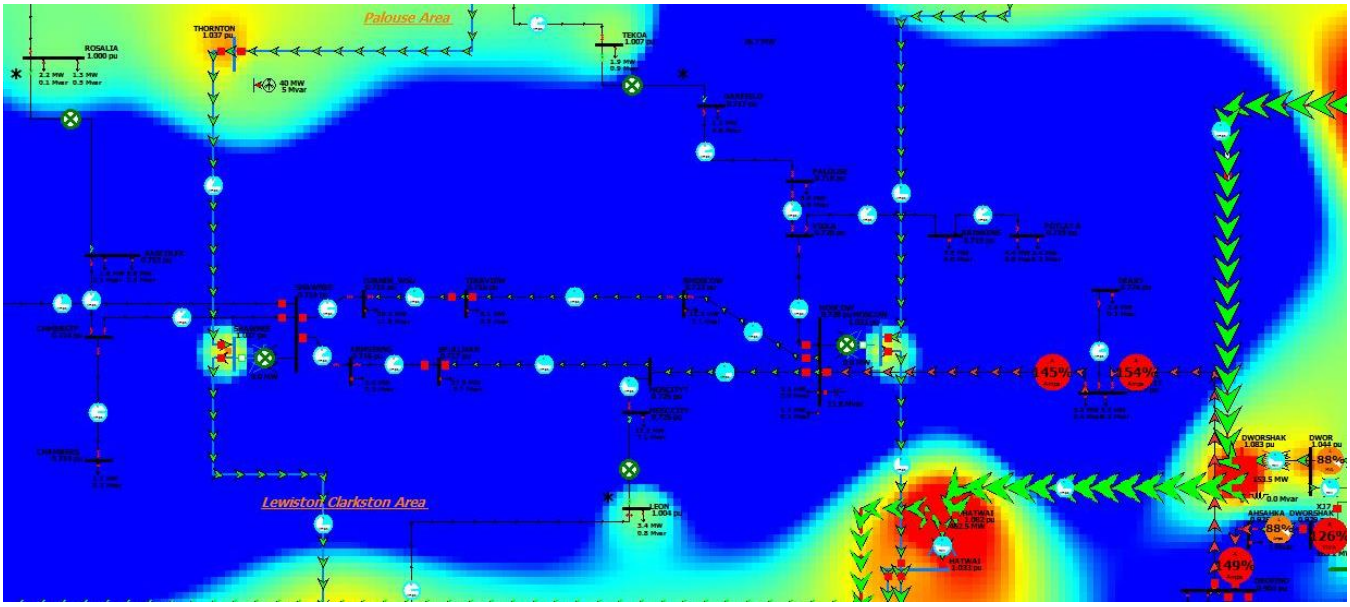


FIGURE III-11: N-1-1: MOSCOW 230/115 AND SHAWNEE 230/115 IN 20HS

Timeline

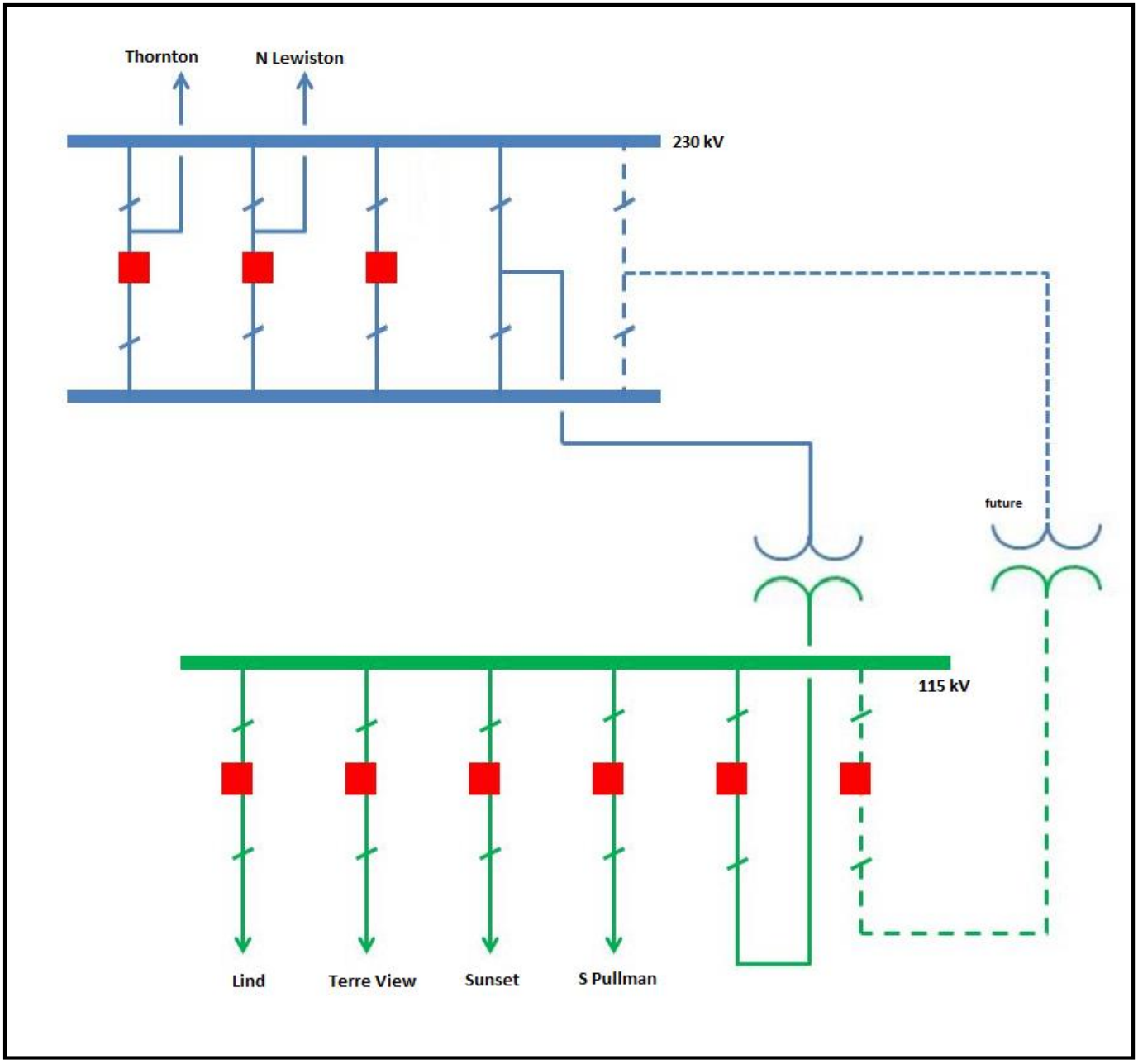
System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 heavy summer.

Performance Criteria Violations

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
P6			
N-1: Hatwai - Moscow 230 230 kV + T-1: Shawnee 230/115 kV			
EWAN (48121)		0.9474	0.9339
CHAMBERS (47503)			0.9449
CHMBRSTP (48073)			0.9452
DIAMOND (48109)			0.9392
EASCOLFX (48115)			0.9435
SHAWNEE (48383)			0.9465
TERRVIEW (48430)			0.9491
TURNER_WSU (48291)			0.9473
ARMSTRNG (47501)			0.9487
N-1: Moscow 230 - South Pullman 115 kV (M23-SPU) + T-1: Shawnee 230/115 kV			
EWAN (48121)	0.9494	0.9443	0.9326
SPULLMAN (48413)	0.9485	0.9431	0.9309
CHAMBERS (47503)			0.9436
CHMBRSTP (48073)			0.944
DIAMOND (48109)		0.9493	0.938
EASCOLFX (48115)			0.9422
SHAWNEE (48383)			0.9453
ARMSTRNG (47501)			0.939
MOSCOW (48247) -> NMOSCOW (48273) CKT 1			100.1 %
N-1: Moscow 230 - Terre View 115 kV (M23-NMO) + T-1: Shawnee 230/115 kV			
EWAN (48121)	0.9352	0.9293	0.9155
CHAMBERS (47503)	0.9454	0.9398	0.9267
CHMBRSTP (48073)	0.9457	0.9401	0.9271
DIAMOND (48109)	0.9402	0.9344	0.9209
EASCOLFX (48115)	0.9442	0.9385	0.9253
MOSCOW (48247) -> MOSCITYT (48245) CKT 1	101.6 %	106.3 %	117.1 %
SHAWNEE (48383)	0.9469	0.9413	0.9285
TERRVIEW (48430)	0.9337	0.9275	0.9131
TURNER_WSU (48291)	0.9342	0.928	0.9137
ARMSTRNG (47501)			0.941

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
N-1: Moscow 230 - Terre View 115 kV (TVW-NMO) + T-1: Shawnee 230/115 kV			
EWAN (48121)	0.9327	0.9266	0.9123
CHAMBERS (47503)	0.9429	0.9371	0.9236
CHMBRSTP (48073)	0.9432	0.9374	0.924
DIAMOND (48109)	0.9377	0.9317	0.9178
EASCOLFX (48115)	0.9417	0.9358	0.9222
MOSCOW (48247) -> MOSCITYT (48245) CKT 1	101.8 %	106.6 %	117.5 %
SHAWNEE (48383)	0.9444	0.9386	0.9254
TERRVIEW (48430)	0.9312	0.9248	0.91
TURNER_WSU (48291)	0.9316	0.9253	0.9105
ARMSTRNG (47501)		0.9499	0.938
T-1: Hatwai 500/230 kV + T-1: Moscow 230/115 kV			
BRINKENS (40149)			0.94
GARFIELD (48133)			0.9385
PALOUSE (48313)			0.9394
POTLAT A (48341)			0.9397
SPULLMAN (48413)			0.9496
TERRVIEW (48430)			0.9492
TURNER_WSU (48291)			0.9496
MOSCCITY (48243)			0.9498
NMOSCOW (48273)			0.9499
VIOLA (48445)			0.9421
T-1: Hatwai 500/230 kV + T-1: Shawnee 230/115 kV			
EWAN (48121)			0.9415
DIAMOND (48109)			0.9468
T-1: Moscow 230/115 kV + T-1: Shawnee 230/115 kV			
BRINKENS (40149)	0.369	0.3503	0.3164
GARFIELD (48133)	0.3671	0.3483	0.3142
PALOUSE (48313)	0.3684	0.3496	0.3155
POTLAT A (48341)	0.3686	0.3499	0.316
EWAN (48121)	0.3343	0.3152	0.2808
SPULLMAN (48413)	0.359	0.3398	0.305
CHAMBERS (47503)	0.3493	0.33	0.2951
CHMBRSTP (48073)	0.3498	0.3305	0.2956
DIAMOND (48109)	0.3411	0.322	0.2874
EASCOLFX (48115)	0.3477	0.3283	0.2934
SHAWNEE (48383)	0.3516	0.3323	0.2974
TERRVIEW (48430)	0.3557	0.3364	0.3016
TURNER_WSU (48291)	0.3533	0.3341	0.2992
AHSAHKA (40023) -> OROFINO (48303) CKT 1	154.6 %	156.4 %	160.0 %
ARMSTRNG (47501)	0.3547	0.3354	0.3006
COTTNWDT (48087)	0.8539	0.8468	0.8334
COTTNWOD (48089)	0.8527	0.8455	0.832
CRAIGMNT (48091)	0.8881	0.8827	0.8731
DEARY (48101)	0.521	0.5064	0.4801
EGRANTAP (48119)	0.8558	0.8483	0.8342
EGRANVIL (40383)	0.8557	0.8482	0.8341
GRANGVIL (48141)	0.8561	0.8486	0.8345
JAYPE (48167)	0.7772	0.769	0.7538
JULIAETT (48169)	0.5262	0.5118	0.486
JULIAETT (48169) -> MOSCOW (48247) CKT 1	176.3 %	177.8 %	180.4 %
KAMIAH (48171)	0.8479	0.841	0.8282
KOOSKIA (48177)	0.8466	0.8396	0.8266
MOSCCITY (48243)	0.3781	0.3591	0.3248
MOSCITYT (48245)	0.3785	0.3595	0.3252
MOSCOW (48247)	0.3868	0.368	0.3339
NEZPERCE (48261)	0.8524	0.8457	0.8334
NMOSCOW (48273)	0.3705	0.3515	0.3169
OROFINO (48303)	0.7876	0.7798	0.7654
OROFINO (48303) -> JULIAETT (48169) CKT 1	186.3 %	188.2 %	191.6 %
VIOLA (48445)	0.372	0.3533	0.3193
WEIPPE (48459)	0.7779	0.7697	0.7546
WICKES (48465)	0.8559	0.8484	0.8343
SWEETWTR (48423)		0.9488	0.944

Project Diagram



Garden Springs – Thornton 230 kV Transmission Line

Project Scope/Description

In heavy summer conditions, loss of both the Benewah – Pine Creek 230 kV Transmission Line and Hatwai 500/230 kV Transformer causes the Benewah – Boulder 230 kV Transmission Line to exceed its applicable facility ratings (see Figure III-12). The Benewah – Boulder 230 kV Transmission Line is the only remaining facility connecting Avista's northern System to its southern load. Construction of an alternate path from north to south will mitigate the observed system deficiencies. Conceptually, a 230 kV transmission line from Garden Springs to Thornton will improve System performance. The timing and coordination of how Garden Springs Station will be integrated into other stations in Spokane will significantly impact how the Garden Springs – Thornton 230 kV Transmission Line will function.

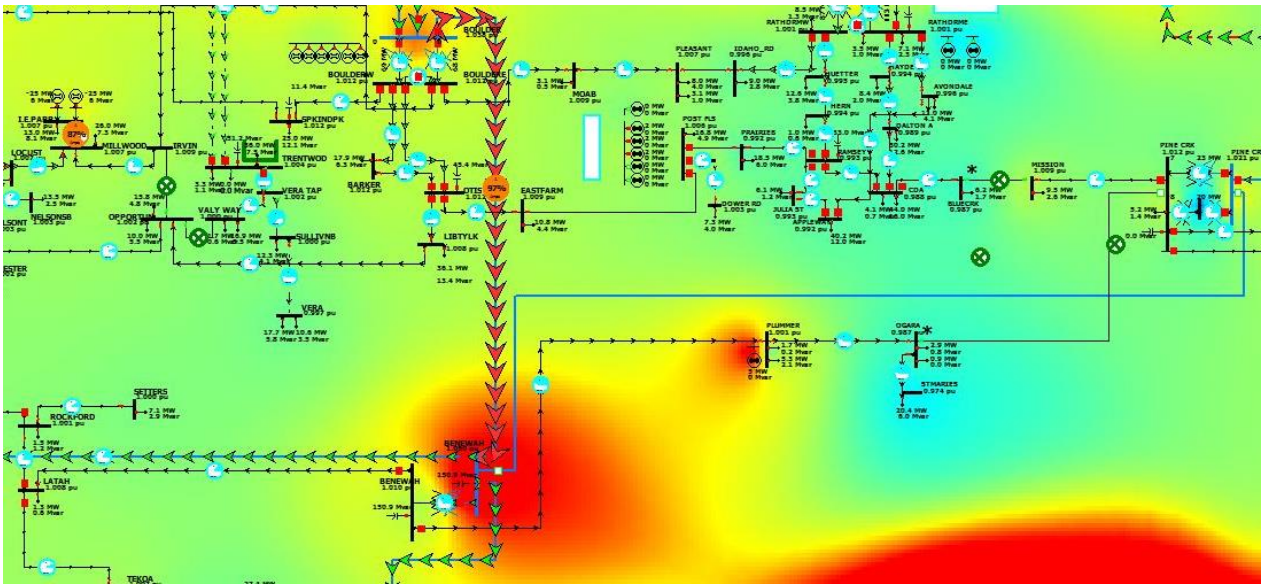


FIGURE III-12: N-1-1: BENEWAH – PINE CREEK 230 KV AND HATWAI 500/230 IN 25HS

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2020 heavy summer.

Performance Criteria Violations

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
P6			
N-1: Benewah - Pine Creek 230 kV + T-1: Hatwai 500/230 kV			
BOULDER (48524) -> BENEWAH (48037) CKT 1	**100.3 %**	**100.8 %**	**102.4 %**

6.3.6 New Proposals

There are no new proposed Corrective Action Plans planned for the Palouse area.

6.4 Single System Projects

6.4.1 North Moscow Transformation

It has been proposed to add an additional 20 MVA distribution transformer to the North Moscow Station. The additional transformer at North Moscow Station is needed within five years. The project was initially proposed based on a new large growth area off Highway 270 near the Idaho and Washington state line.

6.4.2 Tamarack Station

A new distribution station located in the northeastern outlying area of Moscow has been proposed. The new substation has been named Tamarack Station and is proposed to be connected to the Moscow 230 – Terre View 115 kV Transmission Line approximately 1.5 miles east of North Moscow Station. Tamarack Station is needed within five years depending on specific load growth in the area.

6.4.3 Moscow City 115 SCADA/Minor Rebuild

The Moscow City Station needs some SCADA upgrades, and in conjunction it makes sense to replace some equipment approaching end of life. This may have to wait until construction of Tamarack Station is complete.

6.4.4 Potlatch Transformer Replacement

The transformer at Potlatch is due for replacement in the 5-10 year timeframe.

6.4.5 Tekoa SCADA upgrade/Minor Rebuild

Tekoa Station needs new station regulators and breakers, and also needs SCADA installed. This should be looked at in the 5-10 year timeframe.

6.4.6 Benewah – Moscow 230 kV Transmission Line Rebuild

Reconstruction of the Benewah – Moscow 230 kV Transmission Line has multiple purposes. The project was initially developed from an asset management perspective based on the age and type of the structures. The Moscow Station Rebuild Project requires a new communication medium between Moscow and Benewah Stations. The rebuild of the Benewah – Moscow 230 kV Transmission Line will facilitate the addition of fiber optic wire between the two stations. The scope of the project does not include replacing the conductor.

6.4.7 Deary – Potlatch 115 kV Transmission Line

The Deary and Potlatch Stations are served by radial 115 kV transmission lines. The Potlatch tap is 10 miles long and also serves Clearwater Power's 69 kV system out of Brinken's Corner Station. The Deary tap is over 20 miles long. Construction of a new 115 kV transmission line between Deary and Potlatch Stations would improve reliability of the stations. Further

evaluation is necessary to determine the desired operation of the new transmission line. The new transmission line may be operated normally open with an automatic restoration scheme or new 115 kV switching stations need to be constructed along both the Latah – Moscow and Moscow – Orofino 115 kV Transmission Lines.

The project is presently being evaluated.

6.5 Spare Equipment Study

Facility rating violations from the Spare Equipment Study are provided in Table III-15.

6.5.1 Shawnee and Moscow Transformer Failure

Failure of either the Moscow 230/115 kV Transformer or Shawnee 230/115 kV Transformer requiring complete replacement causes thermal overloads on the Moscow – Orofino 115 kV Transmission Line and low voltage issues in the local area with a subsequent outage of the remaining transformer. Subsequent outages of either the Moscow – South Pullman or Moscow – Terre View 115 kV transmission lines with a failure of the Shawnee 230/115 kV Transformer also causes low voltages near the Shawnee Station.

The addition of a second transformer at Shawnee Station will mitigate the performance issues related to a transformer failure at Shawnee or Moscow Stations. There is some operational flexibility with the existing system to radialize the system or close normally open transmission lines to address the performance issues.

Row Labels	M23	SHN
P1		
N-1: Dworshak - Hatwai 500 kV		
BENEWAH (48037)	1.0097	1.0099
N-1: Moscow 230 - South Pullman 115 kV (M23-SPU)		
EWAN (48121)		0.9495
SPULLMAN (48413)		0.9486
N-1: Moscow 230 - Terre View 115 kV (M23-NMO)		
CHAMBERS (47503)		0.9455
CHMBRSTP (48073)		0.9458
DIAMOND (48109)		0.9403
EASCOLFX (48115)		0.9443
EWAN (48121)		0.9353
MOSCOW (48247) -> MOSCITYT (48245) CKT 1 at MOSCITYT		101.6 %
SHAWNEE (48383)		0.947
TERRVIEW (48430)		0.9338
TURNER_WSU (48291)		0.9342
N-1: Moscow 230 - Terre View 115 kV (TVW-NMO)		
CHAMBERS (47503)		0.943
CHMBRSTP (48073)		0.9433
DIAMOND (48109)		0.9378
EASCOLFX (48115)		0.9418
EWAN (48121)		0.9328
MOSCOW (48247) -> MOSCITYT (48245) CKT 1 at MOSCITYT		101.8 %
SHAWNEE (48383)		0.9445
TERRVIEW (48430)		0.9313
TURNER_WSU (48291)		0.9317
N-1: North Lewiston - Shawnee 230 kV		
SHAWNEE (48385)	1.0067	
N-1: Shawnee - Terre View 115 kV (SHN-TUR)		
TERRVIEW (48430)	0.9467	
TURNER_WSU (48291)	0.9452	
T-1: Hatwai 500/230 kV		
SHAWNEE (48385)	1.0081	
STMARIES (48417)		0.9499
THORNTON (48432)	1.0091	
N-1: Hatwai - Moscow 230 230 kV		
MOSCOW (48249)		0.997
T-1: Shawnee 230/115 kV		
AHSAHKA (40023) -> OROFINO (48303) CKT 1 at OROFINO	154.6 %	
ARMSTRNG (47501)	0.3547	

Row Labels	M23	SHN
BRINKENS (40149)	0.369	
CHAMBERS (47503)	0.3493	
CHMBRSTP (48073)	0.3498	
COTTNWDT (48087)	0.8539	
COTTNWOD (48089)	0.8526	
CRAIGMNT (48091)	0.888	
DEARY (48101)	0.521	
DIAMOND (48109)	0.3411	
EASCOLFX (48115)	0.3476	
EGRANTAP (48119)	0.8557	
EGRANVIL (40383)	0.8556	
EWAN (48121)	0.3343	
GARFIELD (48133)	0.3671	
GRANGVIL (48141)	0.856	
JAYPE (48167)	0.7772	
JULIAETT (48169)	0.5261	
JULIAETT (48169) -> MOSCOW (48247) CKT 1 at MOSCOW	176.3 %	
KAMIAH (48171)	0.8479	
KOOSKIA (48177)	0.8466	
MOSCCITY (48243)	0.3781	
MOSCITYT (48245)	0.3785	
MOSCOW (48247)	0.3868	
NEZPERCE (48261)	0.8523	
NMOSCOW (48273)	0.3705	
OROFINO (48303)	0.7876	
OROFINO (48303) -> JULIAETT (48169) CKT 1 at JULIAETT	186.3 %	
PALOUSE (48313)	0.3683	
POTLAT A (48341)	0.3686	
SHAWNEE (48383)	0.3515	
SPULLMAN (48413)	0.359	
TERRVIEW (48430)	0.3556	
TURNER_WSU (48291)	0.3533	
VIOLA (48445)	0.372	
WEIPPE (48459)	0.7779	
WICKES (48465)	0.8558	
T-1: Moscow 230/115 kV		
AHSAHKA (40023) -> OROFINO (48303) CKT 1 at OROFINO		154.6 %
ARMSTRNG (47501)		0.3547
BRINKENS (40149)		0.3691
CHAMBERS (47503)		0.3493
CHMBRSTP (48073)		0.3498
COTTNWDT (48087)		0.854
COTTNWOD (48089)		0.8527
CRAIGMNT (48091)		0.8881
DEARY (48101)		0.521
DIAMOND (48109)		0.3412
EASCOLFX (48115)		0.3477
EGRANTAP (48119)		0.8558
EGRANVIL (40383)		0.8557
EWAN (48121)		0.3343
GARFIELD (48133)		0.3671
GRANGVIL (48141)		0.8561
JAYPE (48167)		0.7773
JULIAETT (48169)		0.5262
JULIAETT (48169) -> MOSCOW (48247) CKT 1 at MOSCOW		176.3 %
KAMIAH (48171)		0.8479
KOOSKIA (48177)		0.8467
MOSCCITY (48243)		0.3782
MOSCITYT (48245)		0.3785
MOSCOW (48247)		0.3869
NEZPERCE (48261)		0.8524
NMOSCOW (48273)		0.3706
OROFINO (48303)		0.7877

Row Labels	M23	SHN
OROFINO (48303) -> JULIAETT (48169) CKT 1 at JULIAETT		186.3 %
PALOUSE (48313)		0.3684
POTLAT A (48341)		0.3687
SHAWNEE (48383)		0.3516
SPULLMAN (48413)		0.359
TERRVIEW (48430)		0.3557
TURNER_WSU (48291)		0.3534
VIOLA (48445)		0.3721
WEIPPE (48459)		0.778
WICKES (48465)		0.8559
P2		
BF: 4652 Dworshak-Taft, Dworshak-Hatwai, Dworshak 500 kV Switched Shunt		
BENEWAH (48037)	1.0097	1.0098
BF: A632 Shawnee 115 kV, Shawnee-Terre View		
AHSAHKA (40023) -> OROFINO (48303) CKT 1 at OROFINO	151.8 %	
ARMSTRNG (47501)	0.4391	
BRINKENS (40149)	0.442	
COTTNWDT (48087)	0.8743	
COTTNWOD (48089)	0.8731	
CRAIGMNT (48091)	0.9034	
DEARY (48101)	0.5756	
EGRANTAP (48119)	0.8765	
EGRANVIL (40383)	0.8764	
GARFIELD (48133)	0.4399	
GRANGVIL (48141)	0.8768	
JAYPE (48167)	0.804	
JULIAETT (48169)	0.5807	
JULIAETT (48169) -> MOSCOW (48247) CKT 1 at MOSCOW	167.6 %	
KAMIAH (48171)	0.868	
KOOSKIA (48177)	0.8667	
MOSCCITY (48243)	0.4536	
MOSCITYT (48245)	0.454	
MOSCOW (48247)	0.4611	
NEZPERCE (48261)	0.8723	
NMOSCOW (48273)	0.4451	
OROFINO (48303)	0.8139	
OROFINO (48303) -> JULIAETT (48169) CKT 1 at JULIAETT	178.0 %	
PALOUSE (48313)	0.4413	
POTLAT A (48341)	0.4416	
SPULLMAN (48413)	0.4393	
TERRVIEW (48430)	0.4306	
TURNER_WSU (48291)	0.4283	
VIOLA (48445)	0.4452	
WEIPPE (48459)	0.8046	
WICKES (48465)	0.8766	
BF: A634 Shawnee 115 kV, Shawnee-South Pullman		
AHSAHKA (40023) -> OROFINO (48303) CKT 1 at OROFINO	151.7 %	
BRINKENS (40149)	0.4455	
COTTNWDT (48087)	0.8754	
COTTNWOD (48089)	0.8742	
CRAIGMNT (48091)	0.9041	
DEARY (48101)	0.5784	
EGRANTAP (48119)	0.8776	
EGRANVIL (40383)	0.8775	
GARFIELD (48133)	0.4434	
GRANGVIL (48141)	0.8779	
JAYPE (48167)	0.8054	
JULIAETT (48169)	0.5834	
JULIAETT (48169) -> MOSCOW (48247) CKT 1 at MOSCOW	167.2 %	
KAMIAH (48171)	0.869	
KOOSKIA (48177)	0.8678	
MOSCCITY (48243)	0.4572	
MOSCITYT (48245)	0.4576	

Row Labels	M23	SHN
MOSCOW (48247)	0.4646	
NEZPERCE (48261)	0.8733	
NMOSCOW (48273)	0.4486	
OROFINO (48303)	0.8152	
OROFINO (48303) -> JULIAETT (48169) CKT 1 at JULIAETT	177.5 %	
PALOUSE (48313)	0.4448	
POTLAT A (48341)	0.4451	
SPULLMAN (48413)	0.4432	
TERRVIEW (48430)	0.434	
TURNER_WSU (48291)	0.4318	
VIOLA (48445)	0.4487	
WEIPPE (48459)	0.806	
WICKES (48465)	0.8777	
BF: A845 Moscow-Terre View, Moscow 230/115 kV Transformer		
AHSAHKA (40023) -> OROFINO (48303) CKT 1 at OROFINO		146.0 %
ARMSTRNG (47501)		0.3683
BRINKENS (40149)		0.437
CHAMBERS (47503)		0.3498
CHMBRSTP (48073)		0.3503
COTTNWDT (48087)		0.8797
COTTNWOD (48089)		0.8785
CRAIGMNT (48091)		0.9076
DEARY (48101)		0.5814
DIAMOND (48109)		0.3416
EASCOLFX (48115)		0.3481
EGRANTAP (48119)		0.882
EGRANVIL (40383)		0.8819
EWAN (48121)		0.3348
GARFIELD (48133)		0.4349
GRANGVIL (48141)		0.8823
JAYPE (48167)		0.8104
JULIAETT (48169)		0.5864
JULIAETT (48169) -> MOSCOW (48247) CKT 1 at MOSCOW		160.7 %
KAMIAH (48171)		0.8732
KOOSKIA (48177)		0.872
MOSCCITY (48243)		0.439
MOSCITYT (48245)		0.4394
MOSCITYT (48245) -> SPULLMAN (48413) CKT 1 at SPULLMAN		107.6 %
MOSCOW (48247)		0.456
MOSCOW (48247) -> MOSCITYT (48245) CKT 1 at MOSCITYT		143.3 %
NEZPERCE (48261)		0.8775
OROFINO (48303)		0.8202
OROFINO (48303) -> JULIAETT (48169) CKT 1 at JULIAETT		170.5 %
PALOUSE (48313)		0.4363
POTLAT A (48341)		0.4366
SHAWNEE (48383)		0.352
SPULLMAN (48413)		0.3913
TERRVIEW (48430)		0.3342
TURNER_WSU (48291)		0.3348
VIOLA (48445)		0.4402
WEIPPE (48459)		0.811
WICKES (48465)		0.882
BUS: Hatwai 230 kV		
CHAMBERS (47503)		0.9474
CHMBRSTP (48073)		0.9477
DIAMOND (48109)		0.9421
EASCOLFX (48115)		0.9461
EWAN (48121)		0.9372
MOSCOW (48249)	1.0094	0.9795
PALOUSE_WIND (48863)	0.9996	
SHAWNEE (48383)		0.9488
SHAWNEE (48385)	0.9979	
STMARIES (48417)		0.9483

Row Labels	M23	SHN
THORNTON (48432)	0.9979	
TURNER_WSU (48291)		0.9494
BUS: North Lewiston 230 kV		
SHAWNEE (48385)	1.0059	
BUS: Sand Dunes 115 kV		
RITZVILL (48365)	0.9419	
ROXBORO (48375)	0.9486	
BUS: Shawnee 115 kV		
AHSAHKA (40023) -> OROFINO (48303) CKT 1 at OROFINO	151.8 %	
ARMSTRNG (47501)	0.4391	
BRINKENS (40149)	0.442	
COTTNWDT (48087)	0.8743	
COTTNWOD (48089)	0.8731	
CRAIGMNT (48091)	0.9034	
DEARY (48101)	0.5756	
EGRANTAP (48119)	0.8765	
EGRANVIL (40383)	0.8764	
GARFIELD (48133)	0.4399	
GRANGVIL (48141)	0.8768	
JAYPE (48167)	0.804	
JULIAETT (48169)	0.5807	
JULIAETT (48169) -> MOSCOW (48247) CKT 1 at MOSCOW	167.6 %	
KAMIAH (48171)	0.868	
KOOSKIA (48177)	0.8667	
MOSCCITY (48243)	0.4536	
MOSCITYT (48245)	0.454	
MOSCOW (48247)	0.4611	
NEZPERCE (48261)	0.8723	
NMOSCOW (48273)	0.4451	
OROFINO (48303)	0.8139	
OROFINO (48303) -> JULIAETT (48169) CKT 1 at JULIAETT	178.0 %	
PALOUSE (48313)	0.4413	
POTLAT A (48341)	0.4416	
SPULLMAN (48413)	0.4393	
TERRVIEW (48430)	0.4306	
TURNER_WSU (48291)	0.4283	
VIOLA (48445)	0.4452	
WEIPPE (48459)	0.8046	
WICKES (48465)	0.8766	
BUS: Shawnee 230 kV		
AHSAHKA (40023) -> OROFINO (48303) CKT 1 at OROFINO	155.6 %	
ARMSTRNG (47501)	0.3532	
BRINKENS (40149)	0.3676	
CHAMBERS (47503)	0.3479	
CHMBRSTP (48073)	0.3484	
COTTNWDT (48087)	0.8516	
COTTNWOD (48089)	0.8504	
CRAIGMNT (48091)	0.8858	
DEARY (48101)	0.5193	
DIAMOND (48109)	0.3397	
EASCOLFX (48115)	0.3462	
EGRANTAP (48119)	0.8534	
EGRANVIL (40383)	0.8533	
EWAN (48121)	0.3329	
GARFIELD (48133)	0.3656	
GRANGVIL (48141)	0.8538	
JAYPE (48167)	0.7751	
JULIAETT (48169)	0.5245	
JULIAETT (48169) -> MOSCOW (48247) CKT 1 at MOSCOW	175.9 %	
KAMIAH (48171)	0.8457	
KOOSKIA (48177)	0.8444	
MOSCCITY (48243)	0.3766	
MOSCITYT (48245)	0.377	

Row Labels	M23	SHN
MOSCOW (48247)	0.3853	
NEZPERCE (48261)	0.8501	
NMOSCOW (48273)	0.3691	
OROFINO (48303)	0.7855	
OROFINO (48303) -> JULIAETT (48169) CKT 1 at JULIAETT	185.9 %	
PALOUSE (48313)	0.3669	
POTLAT A (48341)	0.3672	
SHAWNEE (48383)	0.3501	
SPULLMAN (48413)	0.3576	
SWEETWTR (48423)	0.9492	
TERRVIEW (48430)	0.3542	
TURNER_WSU (48291)	0.3519	
VIOLA (48445)	0.3706	
WEIPPE (48459)	0.7757	
WICKES (48465)	0.8535	
BUS: Terre View 115 kV		
EWAN (48121)		0.9476
TURNER_WSU (48291)		0.9494
N-1: Moscow 230 - South Pullman 115 kV Open @ M23		
ARMSTRNG (47501)		0.9134
CHAMBERS (47503)		0.9227
CHMBRSTP (48073)		0.923
DIAMOND (48109)		0.9173
EASCOLFX (48115)		0.9214
EWAN (48121)		0.9122
MOSCCITY (48243)		0.8912
MOSCITYT (48245)		0.8915
MOSCOW (48247) -> NMOSCOW (48273) CKT 1 at NMOSCOW		116.5 %
SHAWNEE (48383)		0.9242
SPULLMAN (48413)		0.8997
TURNER_WSU (48291)		0.9457
N-1: Moscow 230 - South Pullman 115 kV Open @ SPU		
DIAMOND (48109)		0.9495
EWAN (48121)		0.9447
SPULLMAN (48413)		0.9437
N-1: Moscow 230 - Terre View 115 kV Open @ M23		
ARMSTRNG (47501)		0.9435
CHAMBERS (47503)		0.929
CHMBRSTP (48073)		0.9293
DIAMOND (48109)		0.9236
EASCOLFX (48115)		0.9277
EWAN (48121)		0.9186
MOSCOW (48247) -> MOSCITYT (48245) CKT 1 at MOSCITYT		113.6 %
NMOSCOW (48273)		0.9113
SHAWNEE (48383)		0.9305
TERRVIEW (48430)		0.9135
TURNER_WSU (48291)		0.9144
N-1: Shawnee - Terre View 115 kV Open @ TVW		
DIAMOND (48109)		0.9498
EWAN (48121)		0.945
TURNER_WSU (48291)		0.9468

TABLE III-15: PALOUSE SPARE EQUIPMENT CONTINGENCY ANALYSIS RESULTS.

6.7 Voltage Stability Study

A Load Ramp PV Curve analysis was conducted while monitoring all buses in the Palouse area. All loads within the Palouse area were increased until voltage collapse occurred. All additional generation necessary to supply the increase in load came from a distribution of all generation in WECC except those within the Palouse area.

The theoretical flow limit is 1250 MW for all lines in service condition. The critical bus under all lines in service condition is Garfield Station. The limiting contingency is the loss of both the Shawnee and Moscow 230/115 kV transformers with total area load of 105 MW. Figure III-13 shows the results of the Load Ramp PV Curve analysis but the two transformer contingency is not represented on the plot because the nose point for the outage is less than the existing load level of 168 MW represent in the model.

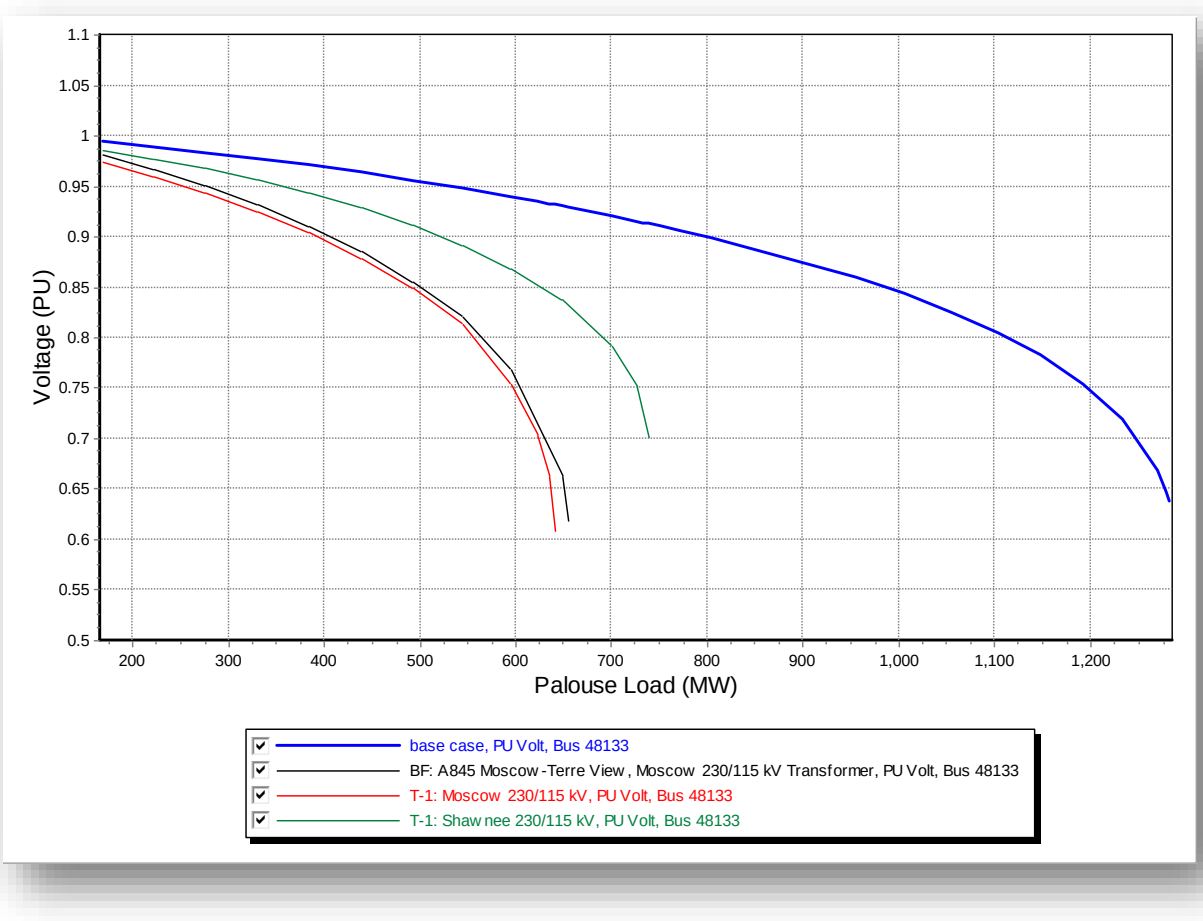


FIGURE III-13: PALOUSE LOAD RAMP PV CURVE RESULTS – EXISTING SYSTEM

The load ramp PV curve analysis was repeated with the assumption that all planned corrective action plans listed above are constructed. The performance of the area transmission system is not improved as no projects are planned for construction which impact how the Palouse transmission system functions.

6.8 Stability Study Results

No system deficiencies were found.

7 SPOKANE AREA

7.1 Executive Summary

The Spokane area transmission system demonstrated performance issues in the near term and long term planning horizons. Several performance issues exist in the present state of the system and worsen with time. The most severe performance issue in the Spokane area is caused by the tie breaker failure of A600 at Beacon Station. The area's dependence on the Beacon Station leaves the system with a single point of failure causing several thermal overload violations.

Integrating new 230 kV facilities at the existing Ninth & Central Station will conceptually mitigate the observed performance issues for the breaker failure at Beacon Station. Additional 230 kV infrastructure, including the proposed Garden Springs Station and 230 kV transmission lines connecting Garden Springs to Ninth & Central, Westside, and Thornton, will provide greatly improved transmission system performance in the near and long term planning horizon. Constructing a new 230 kV transmission line from the Rathdrum area to Westside station will make Westside a stronger source to the area and increase the ability to transfer generation in the Rathdrum area to load.

Several station rebuilds are planned in the Spokane area due to age and condition. Metro and Sunset station rebuilds are examples of the more notable projects. Coordination with BPA and further analysis is underway to mitigate the issues observed for loss of BPA's Bell #6 230/115 kV Transformer and an outage of an Avista transmission line between Bell and Beacon.

A list of the corrective action plans proposed for the Spokane area is provided in Table III-16.

	Year Problem Starts	Construction Start	Construction End	Consequence	Risk Factor	Priority	Cost Estimate
2-Planned							
Garden Springs 115 kV Station Integration	Present	2017	2019	100	0.1250	12.5000	$8,200,000
Spokane Valley Transmission Reinforcement	Present	2015	2016	210	0.7500	157.5000	$8,890,000
Westside Transformer Replacement	Present	2015	2016	110	0.0125	1.3750	$2,500,000
Ninth & Central - Sunset 115 kV Transmission Line Rebuild	2023	2015	2016	50	0.0010	0.0521	$925,000
3-Needs Further Analysis							
Garden Springs 230 kV Station Integration	2032			200	0.0007	0.1389	$15,000,000
Nine Mile - Westside Protection Upgrade	Present			52	0.5000	26.0000	$200,000
Bell - Beacon Protection Scheme	Present			1710	0.0750	128.2500	$0
4-Conceptual							
Beacon - Francis & Cedar 115 kV Transmission Line Reconductor	2032			22	0.0005	0.0115	$1,500,000
Beacon 230 kV Capacitor	Present			200	0.1250	25.0000	$1,500,000
Garden Springs - Ninth & Central 230 kV Transmission Line	2034			200	0.0063	1.2500	$30,000,000
Garden Springs - Thornton 230 kV Transmission Line	Present			600	0.0094	5.6250	$30,000,000
Ninth & Central 230 kV Integration	Present			750	0.0750	56.2500	$15,000,000
Rathdrum - Westside 230 kV Transmission Line	2034			200	0.0005	0.0938	$30,000,000
Silver Lake Switching Station	2032			24	0.0005	0.0125	$4,000,000

TABLE III-16: SPOKANE CORRECTIVE ACTION PLANS

Additional projects not categorized as corrective action plans are listed in Table III-17.

	Construction Start	Construction End	Cost Estimate
2-Planned			
Chester Station Rebuild	2017	2018	$1,460,000
Deer Park Partial Rebuild	2015	2015	$750,000
Downtown West Station	2016	2018	$2,275,000
Greenacres/Otis Orchards Stations	2015	2015	$1,375,000
Hallett & White - Silver Lake 115 kV Transmission Line Rebuild	2017	2018	$2,025,000
Irvin Distribution	2016	2017	$1,875,000
Metro Station Rebuild	2016	2019	$13,150,000
Ninth & Central Station Upgrade	2015	2017	$2,950,000
Northwest Station Rebuild	2016	2017	$1,675,000
Ross Park Station Rebuild	2015	2017	$6,000,000
Southeast Capacity Increase	2016	2016	$450,000
Sunset Station Rebuild	2017	2019	$3,775,000
3-Needs Further Analysis			
Beacon - Bell - Francis & Cedar - Waikiki Reconfiguration	2016	2017	$2,025,000
Beacon Station Rebuild			
College and Walnut Consolidation/Rebuild			
Downtown East Station			
Hallett & White Capacitor Bank			
Hawthorne Station			
Hillyard Station			
Westside Station Rebuild			

TABLE III-17: SPOKANE FURTHER SINGLE SYSTEM PROJECTS

7.2 System Description

The Avista Spokane area is located primarily in Spokane and Stevens Counties in Washington State. The majority of the load served in the area can be categorized as urban, high density load with the exception of the outlying areas including the edge of the West Plains and the Deer Park/Chewelah Valley. The transmission system consists of several major elements: a 500 kV source at the BPA's Glenn H. Bell (Bell) Station, a 230 kV backbone system which provides sources to the area from generation resources from the East and West as well as capacity for energy transfers across Avista's System, and the underlying 115 kV transmission lines which serve the local loads.

7.2.1 Area Transmission

Transmission Lines

The main 230 kV transmission lines in the Lewiston/Clarkston area are:

- Beacon – Rathdrum
- Boulder Rathdrum
- Beacon – Bell 4 & 5 230 kV transmission lines

In general the remaining sources are connected to the Spokane area through the BPA Transmission System.

Transmission Sources

The main transmission sources that feed the load in the Lewiston/Clarkston area are:

- Hydro generation resources located in Northern Idaho and Western Montana
- Natural gas fired turbines just to the East in Northern Idaho
- hydro generation resources located to the North and West from the Pend Oreille and Columbia Rivers
- local hydro generation resources on the Spokane River
- Bell 500/230 kV Transformer

7.2.2 Area Generation

Non-Avista owned local generation facilities within the Spokane area include the following:

Upriver HED	Units 1& 2 @ 5.8 MW & Unit 3-5 @ 2 MW	City of Spokane
Waste to Energy Systems	Unit 1 @ 22.4 MW	Wheelabrator Environmental

The following are active Generation Interconnection Requests within the Spokane area:

- Project #39 7.6 MW Nine Mile Station

7.3 Corrective Action Plans

7.3.1 Completed

No Corrective Action Plans have recently been completed in the Spokane area.

7.3.2 Planned

Westside Transformer Replacement

Project Scope/Description

The replacement of the existing Westside #1 & #2 230/115 kV Transformers with new 250 MVA nominal capacity transformers is Transmission Planning's preferred mitigating project to address exceedance of the transformers existing applicable facility ratings. In addition to replacing the transformers, it may be prudent for Substation Engineering to determine appropriate investments to reduce risks associated with older equipment within the Westside Station. Further modifications to the Westside Station to meet system performance requirements will be addressed in the appropriate project report such as the Western Spokane Long Term Expansion Plan

Completion of the project will mitigate the performance issues within the ten year planning horizon.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 Heavy Scenarios.

The project is scheduled to be completed by the end of 2016.

Performance Criteria Violations

Due to the large amount of potential violations the Heavy Summer table is used as reference. Potential violations occur for all heavy scenarios.

Heavy Summer Assessment Results

Row Labels	16HS	20HS	25HS	35HS
NA				
WEST (48463) -> WEST (48461) CKT 1				
RES: BUS: Airway Heights 115 kV				100.3 %
RES: N-1: Benewah - Latah Jct 115 kV				100.1 %
RES: N-1: Devils Gap - Ninemile 115 kV and Ninemile - Westside 115 kV				112.7 %
RES: N-1: Eighth & Fancher - Latah Jct 115 kV Open @ LAT				100.1 %
RES: N-2 (ROW and ADJ): Airway Heights - Devils Gap 115 kV and Devils Gap - Nine Mile 115 kV	100.3 %		109.7 %	126.1 %
RES: N-2 (ROW and ADJ): Airway Heights - Sunset 115 kV and Sunset - Westside 115 kV				105.0 %
RES: N-2 (ROW): Beacon - Boulder 230 kV and Beacon - Rathdrum 230 kV and Beacon - Boulder #1 115 kV				107.4 %
RES: N-2 (STR): Benewah - Thornton 230 kV & Benewah - Latah 115 kV				106.1 %
RES: N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV				110.9 %
P1				
WEST (48463) -> WEST (48461) CKT 1				
G-1: Nine Mile Hydro Units 1-4				100.5 %
N-1: Beacon - Bell #4 230 kV				105.1 %
N-1: Beacon - Bell #5 230 kV				105.3 %
N-1: Beacon - Boulder 230 kV				100.0 %
N-1: Beacon - Francis & Cedar 115 kV				101.3 %
N-1: Beacon - Ninth & Central #1 115 kV				101.6 %
N-1: Beacon - Ninth & Central #2 115 kV				101.6 %
N-1: Beacon - Ross Park 115 kV			101.6 %	115.0 %
N-1: Bell - Northeast 115 kV				105.2 %
N-1: Boulder - Lancaster 230 kV				104.7 %
N-1: Boulder #1 230/115 kV				101.9 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Boulder #2 230/115 kV				101.9 %
N-1: Devils Gap - Nine Mile 115 kV				103.9 %
N-1: Metro - Post Street 115 kV				100.7 %
N-1: Metro - Sunset 115 kV				100.1 %
N-1: Nine Mile - Westside 115 kV				101.5 %
N-1: Ninth & Central - Third & Hatch 115 kV				101.1 %
N-1: Post Street - Third & Hatch 115 kV				105.7 %
N-1: Ross Park - Third & Hatch 115 kV				102.8 %
S-1: Third & Hatch 115kV Switched Shunt				100.3 %
T-1: Beacon #1 230/115 kV			101.9 %	114.5 %
T-1: Beacon #2 230/115 kV			101.8 %	114.4 %
T-1: Bell #6 230/115 kV			102.5 %	115.9 %
T-1: Boulder Park #1 115/13.8 kV				100.1 %
T-1: Nine Mile #2 115/13.8 kV				100.5 %
T-1: Westside #2 230/115 kV	108.1 %	117.6 %	125.8 %	142.3 %
WEST (48463) -> WEST (48461) CKT 2				
T-1: Westside #1 230/115 kV			101.2 %	114.6 %
P2				
WEST (48463) -> WEST (48461) CKT 1				
BF: A1182 Bell-Lancaster, Lancaster Generator #1 & #2				105.5 %
BF: A1186 Lancaster-Noxon, Boulder-Lancaster				104.9 %
BF: A1234 Boundary East 230 kV, Bell-Boundary #1				100.3 %
BF: A1561 Boulder-Lancaster, Lancaster Generator #1 & #2				104.7 %
BF: A248 Northeast 115 kV, Bell-Northeast				102.4 %
BF: A370 Bell S1 & S2 230 kV				111.4 %
BF: A388 Bell S2 & S3 230 kV	104.7 %	111.6 %	118.9 %	135.1 %
BF: A526 Devils Gap East 115 kV, Airway Heights-Devils Gap			104.6 %	115.7 %
BF: A572 Bell S3 230 kV, Bell-Boundary #3			100.7 %	113.6 %
BF: A600 Beacon North & South 115 kV	159.9 %	172.6 %	184.5 %	210.8 %
BF: A604 Beacon North 115 kV, Beacon-Boulder #1	101.3 %	110.2 %	117.7 %	133.2 %
BF: A612 Beacon South 115 kV, Beacon-Boulder #2				112.2 %
BF: A642 Otis Orchards 115 kV, Otis Orchards-Post Falls				103.7 %
BF: A645 Otis Orchards 115 kV, Boulder-Otis Orchards				103.6 %
BF: A655 Ninemile 115 kV, Ninemile-Westside				102.1 %
BF: A688 Ninth & Central North & South 115 kV			100.7 %	114.3 %
BF: A689 Ninth & Central South 115 kV, Ninth & Central-Otis Orchards				103.7 %
BF: A712 Boulder West 115 kV, Beacon-Boulder #1				104.3 %
BF: A713 Boulder West 115 kV, Boulder-Otis Orchards #1				104.7 %
BF: A717 Boulder East & West 115 kV			106.0 %	118.9 %
BF: A720 Boulder East 115 kV, Boulder-Rathdrum				104.0 %
BF: B1135 Addy 115 kV, Addy-Bell				104.3 %
BF: B346 Bell 115 kV, Addy-Bell				105.2 %
BF: B354 Bell 115 kV, Bell-Coulee				108.2 %
BF: B356 Bell 115 kV, Bell-Northeast				110.4 %
BF: R427 Beacon North & South 230 kV	123.6 %	136.6 %	145.0 %	161.5 %
BF: R452 Beacon-Boulder, Boulder #2 230/115 Transformer				102.3 %
BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer				106.6 %
BF: R552 Beacon-Boulder, Boulder #1 230/115 Transformer				102.3 %
BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer				106.7 %
BUS: Beacon North 115 kV	102.4 %	111.2 %	118.8 %	134.3 %
BUS: Beacon North 230 kV			106.2 %	119.2 %
BUS: Beacon South 115 kV			103.4 %	117.0 %
BUS: Beacon South 230 kV		100.1 %	106.7 %	119.9 %
BUS: Bell 115 kV				108.2 %
BUS: Bell S2 230 kV			101.4 %	114.9 %
BUS: Bell S3 230 kV			100.6 %	113.6 %
BUS: Bell S4 230 kV				105.0 %
BUS: Boulder East 115 kV				104.0 %
BUS: Boulder West 115 kV				106.2 %
BUS: Nine Mile 115 kV				105.5 %
BUS: Ninth & Central North 115 kV				102.4 %
BUS: Ninth & Central South 115 kV				107.9 %
BUS: Otis Orchards 115 kV				104.3 %
BUS: Post Street 115 kV				102.4 %
BUS: Ross Park 115 kV				104.8 %
BUS: Third & Hatch 115 kV				101.7 %
N-1: Beacon - Boulder #1 115 kV Open @ BLD				100.3 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Beacon - Boulder #2 115 kV Open @ BLD				100.7 %
N-1: Bell - Northeast 115 kV Open @ BEL				102.8 %
N-1: Bell - Northeast 115 kV Open @ NE				101.0 %
N-1: Francis & Cedar - Ross Park 115 kV Open @ ROS				100.6 %
N-1: Nine Mile - Westside 115 kV Open @ NMS				104.9 %
N-1: Nine Mile - Westside 115 kV Open @ WES				102.8 %
N-1: Ninth & Central - Otis Orchards 115 kV Open @ OTI				103.9 %
N-1: Ninth & Central - Sunset 115 kV Open @ 9CE				108.5 %
N-1: Ninth & Central - Sunset 115 kV Open @ SUN				100.0 %
WEST (48463) -> WEST (48461) CKT 2				
BF: A388 Bell S2 & S3 230 kV				104.5 %
BF: A600 Beacon North & South 115 kV	123.5 %	133.3 %	142.5 %	162.9 %
BF: A604 Beacon North 115 kV, Beacon-Boulder #1				102.8 %
BF: R427 Beacon North & South 230 kV		105.4 %	111.9 %	124.7 %
BUS: Beacon North 115 kV				103.7 %
P3				
WEST (48463) -> WEST (48461) CKT 1				
G-1: Boulder Park Thermal Units 1-6 + G-1: Lancaster Thermal Units 1&2				100.5 %
G-1: Boulder Park Thermal Units 1-6 + G-1: Noxon Rapids Hydro Units 1-5				100.3 %
G-1: Boulder Park Thermal Units 1-6 + T-1: Cabinet Gorge (12) 230/13.8 kV				100.4 %
G-1: Boulder Park Thermal Units 1-6 + T-1: Cabinet Gorge (34) 230/13.8 kV				100.4 %
G-1: Boulder Park Thermal Units 1-6 + T-1: Noxon #1 230/13.8 kV				101.0 %
G-1: Boulder Park Thermal Units 1-6 + T-1: Noxon #2 230/13.8 kV				100.1 %
G-1: Cabinet Gorge Hydro Units 1-4 + G-1: Upriver Hydro Units 1-5				100.0 %
G-1: Cabinet Gorge Hydro Units 1-4 + N-1: Beacon - Bell #1 115 kV				100.4 %
G-1: Cabinet Gorge Hydro Units 1-4 + N-1: Beacon - Northeast 115 kV				100.0 %
G-1: Cabinet Gorge Hydro Units 1-4 + N-1: Bell - Creston 115 kV				100.4 %
G-1: Cabinet Gorge Hydro Units 1-4 + N-1: Boulder - Otis Orchards #2 115 kV				100.2 %
G-1: Cabinet Gorge Hydro Units 1-4 + S-1: Otis Orchards 115kV Switched Shunt				100.2 %
G-1: Cabinet Gorge Hydro Units 1-4 + S-1: Sunset 115kV Switched Shunt				100.1 %
G-1: Cabinet Gorge Hydro Units 1-4 + S-1: Trentwood 115kV Switched Shunt				100.3 %
G-1: Cabinet Gorge Hydro Units 1-4 + T-1: Upriver 13.8/4.2 kV				100.0 %
G-1: Hungry Horse Hydro Units 1-4 + N-1: Beacon - Bell #1 115 kV				100.3 %
G-1: Hungry Horse Hydro Units 1-4 + N-1: Bell - Creston 115 kV				100.2 %
G-1: Hungry Horse Hydro Units 1-4 + N-1: Boulder - Otis Orchards #2 115 kV				100.0 %
G-1: Hungry Horse Hydro Units 1-4 + S-1: Otis Orchards 115kV Switched Shunt				100.1 %
G-1: Hungry Horse Hydro Units 1-4 + S-1: Trentwood 115kV Switched Shunt				100.2 %
G-1: Kerr Units 1-3 + N-1: Beacon - Bell #1 115 kV				100.0 %
G-1: Lancaster Thermal Units 1&2 + G-1: Nine Mile Hydro Units 1-4				101.9 %
G-1: Lancaster Thermal Units 1&2 + G-1: Upriver Hydro Units 1-5				100.7 %
G-1: Lancaster Thermal Units 1&2 + N-1: Airway Heights - Sunset 115 kV				100.4 %
G-1: Lancaster Thermal Units 1&2 + N-1: Beacon - Bell #1 115 kV				101.1 %
G-1: Lancaster Thermal Units 1&2 + N-1: Beacon - Francis & Cedar 115 kV				102.6 %
G-1: Lancaster Thermal Units 1&2 + N-1: Beacon - Ninth & Central #1 115 kV				102.9 %
G-1: Lancaster Thermal Units 1&2 + N-1: Beacon - Ninth & Central #2 115 kV				102.9 %
G-1: Lancaster Thermal Units 1&2 + N-1: Beacon - Northeast 115 kV				100.7 %
G-1: Lancaster Thermal Units 1&2 + N-1: Beacon - Ross Park 115 kV			102.8 %	116.2 %
G-1: Lancaster Thermal Units 1&2 + N-1: Bell - Creston 115 kV				101.1 %
G-1: Lancaster Thermal Units 1&2 + N-1: Bell - Northeast 115 kV				106.6 %
G-1: Lancaster Thermal Units 1&2 + N-1: Boulder - Otis Orchards #2 115 kV				100.8 %
G-1: Lancaster Thermal Units 1&2 + N-1: Boulder - Post Falls 115 kV Open @ BLD				100.5 %
G-1: Lancaster Thermal Units 1&2 + N-1: Boulder #1 230/115 kV				103.2 %
G-1: Lancaster Thermal Units 1&2 + N-1: Boulder #2 230/115 kV				103.1 %
G-1: Lancaster Thermal Units 1&2 + N-1: Devils Gap - Nine Mile 115 kV				105.2 %
G-1: Lancaster Thermal Units 1&2 + N-1: Metro - Post Street 115 kV				102.0 %
G-1: Lancaster Thermal Units 1&2 + N-1: Metro - Sunset 115 kV				101.4 %
G-1: Lancaster Thermal Units 1&2 + N-1: Nine Mile - Westside 115 kV				102.8 %
G-1: Lancaster Thermal Units 1&2 + N-1: Ninth & Central - Third & Hatch 115 kV				102.4 %
G-1: Lancaster Thermal Units 1&2 + N-1: Post Street - Third & Hatch 115 kV				106.9 %
G-1: Lancaster Thermal Units 1&2 + N-1: Ross Park - Third & Hatch 115 kV				104.1 %
G-1: Lancaster Thermal Units 1&2 + S-1: Airway Heights 115kV Switched Shunt				100.6 %
G-1: Lancaster Thermal Units 1&2 + S-1: Colbert 115kV Switched Shunt				100.6 %
G-1: Lancaster Thermal Units 1&2 + S-1: Deer Park 115kV Switched Shunt				100.4 %
G-1: Lancaster Thermal Units 1&2 + S-1: Otis Orchards 115kV Switched Shunt				100.9 %
G-1: Lancaster Thermal Units 1&2 + S-1: Spokane Ind Park 115kV Switched Shunt				100.5 %
G-1: Lancaster Thermal Units 1&2 + S-1: Sunset 115kV Switched Shunt				100.8 %
G-1: Lancaster Thermal Units 1&2 + S-1: Third & Hatch 115kV Switched Shunt				101.6 %

Row Labels	16HS	20HS	25HS	35HS
G-1: Lancaster Thermal Units 1&2 + S-1: Trentwood 115kV Switched Shunt				101.0 %
G-1: Lancaster Thermal Units 1&2 + T-1: Beacon #1 230/115 kV			103.1 %	115.8 %
G-1: Lancaster Thermal Units 1&2 + T-1: Beacon #2 230/115 kV			103.0 %	115.6 %
G-1: Lancaster Thermal Units 1&2 + T-1: Bell #6 230/115 kV			103.9 %	117.4 %
G-1: Lancaster Thermal Units 1&2 + T-1: Boulder Park #1 115/13.8 kV				101.4 %
G-1: Lancaster Thermal Units 1&2 + T-1: Nine Mile #1 115/2				100.4 %
G-1: Lancaster Thermal Units 1&2 + T-1: Nine Mile #2 115/13.8 kV				101.9 %
G-1: Lancaster Thermal Units 1&2 + T-1: Upriver 13.8/2.4 kV				100.5 %
G-1: Lancaster Thermal Units 1&2 + T-1: Upriver 13.8/4.2 kV				100.7 %
G-1: Lancaster Thermal Units 1&2 + T-1: Westside #2 230/115 kV	110.0 %	119.5 %	127.7 %	144.3 %
G-1: Libby Hydro Units 1-5 + G-1: Upriver Hydro Units 1-5				100.0 %
G-1: Libby Hydro Units 1-5 + N-1: Beacon - Bell #1 115 kV				100.4 %
G-1: Libby Hydro Units 1-5 + N-1: Beacon - Northeast 115 kV				100.0 %
G-1: Libby Hydro Units 1-5 + N-1: Bell - Creston 115 kV				100.4 %
G-1: Libby Hydro Units 1-5 + N-1: Boulder - Otis Orchards #2 115 kV				100.2 %
G-1: Libby Hydro Units 1-5 + S-1: Otis Orchards 115kV Switched Shunt				100.2 %
G-1: Libby Hydro Units 1-5 + S-1: Sunset 115kV Switched Shunt				100.1 %
G-1: Libby Hydro Units 1-5 + S-1: Trentwood 115kV Switched Shunt				100.3 %
G-1: Libby Hydro Units 1-5 + T-1: Upriver 13.8/4.2 kV				100.0 %
G-1: Little Falls Hydro Units 1-4 + N-1: Bell - Creston 115 kV				100.9 %
G-1: Long Lake Hydro Units 1-4 + N-1: Bell - Creston 115 kV				102.9 %
G-1: Long Lake Hydro Units 1-4 + N-1: Devils Gap - Nine Mile 115 kV				105.8 %
G-1: Nine Mile Hydro Units 1-4 + G-1: Noxon Rapids Hydro Units 1-5				101.6 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Beacon - Francis & Cedar 115 kV				102.8 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Beacon - Ninth & Central #1 115 kV				103.1 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Beacon - Ninth & Central #2 115 kV				103.1 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Beacon - Ross Park 115 kV			103.2 %	116.7 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Bell - Northeast 115 kV				106.7 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Boulder #1 230/115 kV				103.4 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Boulder #2 230/115 kV				103.3 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Devils Gap - Nine Mile 115 kV				105.5 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Metro - Post Street 115 kV				102.2 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Metro - Sunset 115 kV				101.6 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Nine Mile - Westside 115 kV				102.1 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Ninth & Central - Third & Hatch 115 kV				102.6 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Post Street - Third & Hatch 115 kV				107.4 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Ross Park - Third & Hatch 115 kV				104.3 %
G-1: Nine Mile Hydro Units 1-4 + S-1: Third & Hatch 115kV Switched Shunt				101.8 %
G-1: Nine Mile Hydro Units 1-4 + T-1: Beacon #1 230/115 kV			103.5 %	116.0 %
G-1: Nine Mile Hydro Units 1-4 + T-1: Beacon #2 230/115 kV			103.3 %	115.9 %
G-1: Nine Mile Hydro Units 1-4 + T-1: Bell #6 230/115 kV			104.0 %	117.4 %
G-1: Nine Mile Hydro Units 1-4 + T-1: Boulder Park #1 115/13.8 kV				101.5 %
G-1: Nine Mile Hydro Units 1-4 + T-1: Cabinet Gorge (12) 230/13.8 kV				101.8 %
G-1: Nine Mile Hydro Units 1-4 + T-1: Cabinet Gorge (34) 230/13.8 kV				101.8 %
G-1: Nine Mile Hydro Units 1-4 + T-1: Noxon #1 230/13.8 kV				102.3 %
G-1: Nine Mile Hydro Units 1-4 + T-1: Westside #2 230/115 kV	110.1 %	119.7 %	127.9 %	144.4 %
G-1: Noxon Rapids Hydro Units 1-5 + G-1: Upriver Hydro Units 1-5				100.5 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Airway Heights - Sunset 115 kV				100.1 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Beacon - Bell #1 115 kV				100.9 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Beacon - Francis & Cedar 115 kV				102.4 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Beacon - Ninth & Central #1 115 kV				102.7 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Beacon - Ninth & Central #2 115 kV				102.7 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Beacon - Northeast 115 kV				100.5 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Bell - Creston 115 kV				100.8 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Bell - Northeast 115 kV				106.4 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Boulder - Otis Orchards #2 115 kV				100.6 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Boulder - Post Falls 115 kV Open @ BLD				100.3 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Boulder #1 230/115 kV				102.9 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Boulder #2 230/115 kV				102.9 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Devils Gap - Nine Mile 115 kV				105.0 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Metro - Post Street 115 kV				101.8 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Metro - Sunset 115 kV				101.2 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Nine Mile - Westside 115 kV				102.6 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Ninth & Central - Third & Hatch 115 kV				102.1 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Ross Park - Third & Hatch 115 kV				103.8 %
G-1: Noxon Rapids Hydro Units 1-5 + S-1: Airway Heights 115kV Switched Shunt				100.4 %
G-1: Noxon Rapids Hydro Units 1-5 + S-1: Colbert 115kV Switched Shunt				100.3 %

Row Labels	16HS	20HS	25HS	35HS
G-1: Noxon Rapids Hydro Units 1-5 + S-1: Deer Park 115kV Switched Shunt				100.1 %
G-1: Noxon Rapids Hydro Units 1-5 + S-1: Otis Orchards 115kV Switched Shunt				100.6 %
G-1: Noxon Rapids Hydro Units 1-5 + S-1: Spokane Ind Park 115kV Switched Shunt				100.3 %
G-1: Noxon Rapids Hydro Units 1-5 + S-1: Sunset 115kV Switched Shunt				100.5 %
G-1: Noxon Rapids Hydro Units 1-5 + S-1: Third & Hatch 115kV Switched Shunt				101.4 %
G-1: Noxon Rapids Hydro Units 1-5 + S-1: Trentwood 115kV Switched Shunt				100.7 %
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Beacon #1 230/115 kV			102.9 %	
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Beacon #2 230/115 kV			102.8 %	
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Bell #6 230/115 kV			103.7 %	
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Boulder Park #1 115/13.8 kV				101.1 %
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Nine Mile #1 115/2				100.1 %
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Nine Mile #2 115/13.8 kV				101.6 %
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Upriver 13.8/2.4 kV				100.2 %
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Upriver 13.8/4.2 kV				100.5 %
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Westside #2 230/115 kV	109.7 %	119.2 %	127.4 %	143.9 %
G-1: Upriver Hydro Units 1-5 + N-1: Beacon - Bell #1 115 kV				100.1 %
G-1: Upriver Hydro Units 1-5 + N-1: Bell - Creston 115 kV				100.0 %
G-1: Upriver Hydro Units 1-5 + T-1: Cabinet Gorge (12) 230/13.8 kV				100.6 %
G-1: Upriver Hydro Units 1-5 + T-1: Cabinet Gorge (34) 230/13.8 kV				100.6 %
G-1: Upriver Hydro Units 1-5 + T-1: Noxon #1 230/13.8 kV				101.2 %
G-1: Upriver Hydro Units 1-5 + T-1: Noxon #2 230/13.8 kV				100.3 %
N-1: 3TM Bell - Boundary #1 230 kV + G-1: Long Lake Hydro Units 1-4				100.7 %
N-1: 3TM Bell - Boundary #3 230 kV + G-1: Boulder Park Thermal Units 1-6				105.8 %
N-1: 3TM Bell - Boundary #3 230 kV + G-1: Nine Mile Hydro Units 1-4				107.1 %
N-1: 3TM Bell - Boundary #3 230 kV + G-1: Upriver Hydro Units 1-5				105.9 %
N-1: Beacon - Bell #4 230 kV + G-1: Lancaster Thermal Units 1&2				106.8 %
N-1: Beacon - Bell #4 230 kV + G-1: Little Falls Hydro Units 1-4				106.3 %
N-1: Beacon - Bell #4 230 kV + G-1: Long Lake Hydro Units 1-4				108.3 %
N-1: Beacon - Bell #4 230 kV + G-1: Nine Mile Hydro Units 1-4				106.6 %
N-1: Beacon - Bell #4 230 kV + G-1: Noxon Rapids Hydro Units 1-5				106.5 %
N-1: Beacon - Bell #5 230 kV + G-1: Lancaster Thermal Units 1&2				107.1 %
N-1: Beacon - Bell #5 230 kV + G-1: Little Falls Hydro Units 1-4				106.5 %
N-1: Beacon - Bell #5 230 kV + G-1: Long Lake Hydro Units 1-4				108.5 %
N-1: Beacon - Bell #5 230 kV + G-1: Nine Mile Hydro Units 1-4				106.8 %
N-1: Beacon - Bell #5 230 kV + G-1: Noxon Rapids Hydro Units 1-5				106.7 %
N-1: Beacon - Boulder 230 kV + G-1: Lancaster Thermal Units 1&2				101.5 %
N-1: Beacon - Boulder 230 kV + G-1: Little Falls Hydro Units 1-4				101.2 %
N-1: Beacon - Boulder 230 kV + G-1: Long Lake Hydro Units 1-4				103.2 %
N-1: Beacon - Boulder 230 kV + G-1: Nine Mile Hydro Units 1-4				101.5 %
N-1: Beacon - Boulder 230 kV + G-1: Noxon Rapids Hydro Units 1-5				101.2 %
N-1: Beacon - Rathdrum 230 kV + G-1: Cabinet Gorge Hydro Units 1-4				100.0 %
N-1: Beacon - Rathdrum 230 kV + G-1: Lancaster Thermal Units 1&2				100.7 %
N-1: Beacon - Rathdrum 230 kV + G-1: Libby Hydro Units 1-5				100.1 %
N-1: Beacon - Rathdrum 230 kV + G-1: Little Falls Hydro Units 1-4				100.6 %
N-1: Beacon - Rathdrum 230 kV + G-1: Long Lake Hydro Units 1-4				102.6 %
N-1: Beacon - Rathdrum 230 kV + G-1: Noxon Rapids Hydro Units 1-5				100.5 %
N-1: Bell - Coulee #3 230 kV + G-1: Cabinet Gorge Hydro Units 1-4				100.2 %
N-1: Bell - Coulee #3 230 kV + G-1: Hungry Horse Hydro Units 1-4				100.0 %
N-1: Bell - Coulee #3 230 kV + G-1: Lancaster Thermal Units 1&2				100.9 %
N-1: Bell - Coulee #3 230 kV + G-1: Libby Hydro Units 1-5				100.2 %
N-1: Bell - Coulee #3 230 kV + G-1: Little Falls Hydro Units 1-4				100.7 %
N-1: Bell - Coulee #3 230 kV + G-1: Long Lake Hydro Units 1-4				102.7 %
N-1: Bell - Coulee #3 230 kV + G-1: Noxon Rapids Hydro Units 1-5				100.6 %
N-1: Bell - Coulee #5 230 kV + G-1: Cabinet Gorge Hydro Units 1-4				100.1 %
N-1: Bell - Coulee #5 230 kV + G-1: Hungry Horse Hydro Units 1-4				100.0 %
N-1: Bell - Coulee #5 230 kV + G-1: Lancaster Thermal Units 1&2				100.8 %
N-1: Bell - Coulee #5 230 kV + G-1: Libby Hydro Units 1-5				100.2 %
N-1: Bell - Coulee #5 230 kV + G-1: Little Falls Hydro Units 1-4				100.7 %
N-1: Bell - Coulee #5 230 kV + G-1: Long Lake Hydro Units 1-4				102.6 %
N-1: Bell - Coulee #5 230 kV + G-1: Noxon Rapids Hydro Units 1-5				100.6 %
N-1: Bell - Coulee #6 500 kV + G-1: Cabinet Gorge Hydro Units 1-4				100.3 %
N-1: Bell - Coulee #6 500 kV + G-1: Dworshak Hydro Units 1-3				100.1 %
N-1: Bell - Coulee #6 500 kV + G-1: Hungry Horse Hydro Units 1-4				100.2 %
N-1: Bell - Coulee #6 500 kV + G-1: Lancaster Thermal Units 1&2				101.0 %
N-1: Bell - Coulee #6 500 kV + G-1: Libby Hydro Units 1-5				100.3 %
N-1: Bell - Coulee #6 500 kV + G-1: Little Falls Hydro Units 1-4				100.7 %
N-1: Bell - Coulee #6 500 kV + G-1: Long Lake Hydro Units 1-4				102.7 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Bell - Coulee #6 500 kV + G-1: Noxon Rapids Hydro Units 1-5				100.8 %
N-1: Bell - Lancaster 230 kV + G-1: Cabinet Gorge Hydro Units 1-4				100.5 %
N-1: Bell - Lancaster 230 kV + G-1: Dworshak Hydro Units 1-3				100.1 %
N-1: Bell - Lancaster 230 kV + G-1: Hungry Horse Hydro Units 1-4				100.3 %
N-1: Bell - Lancaster 230 kV + G-1: Kerr Units 1-3				100.0 %
N-1: Bell - Lancaster 230 kV + G-1: Lancaster Thermal Units 1&2				101.5 %
N-1: Bell - Lancaster 230 kV + G-1: Little Falls Hydro Units 1-4				100.9 %
N-1: Bell - Lancaster 230 kV + G-1: Long Lake Hydro Units 1-4				102.8 %
N-1: Bell - Lancaster 230 kV + G-1: Noxon Rapids Hydro Units 1-5				101.1 %
N-1: Bell - Taft 500 kV + G-1: Lancaster Thermal Units 1&2				100.0 %
N-1: Bell - Taft 500 kV + G-1: Long Lake Hydro Units 1-4				101.9 %
N-1: Bell - Usk 230 kV + G-1: Long Lake Hydro Units 1-4				101.3 %
N-1: Benewah - Pine Creek 230 kV + G-1: Boulder Park Thermal Units 1-6				100.7 %
N-1: Benewah - Pine Creek 230 kV + G-1: Nine Mile Hydro Units 1-4				102.0 %
N-1: Benewah - Pine Creek 230 kV + G-1: Upriver Hydro Units 1-5				100.9 %
N-1: Boulder - Lancaster 230 kV + G-1: Little Falls Hydro Units 1-4				105.9 %
N-1: Boulder - Lancaster 230 kV + G-1: Long Lake Hydro Units 1-4				107.9 %
N-1: Boulder - Lancaster 230 kV + G-1: Nine Mile Hydro Units 1-4				106.2 %
N-1: Cabinet - Rathdrum 230 kV + G-1: Boulder Park Thermal Units 1-6				100.9 %
N-1: Cabinet - Rathdrum 230 kV + G-1: Nine Mile Hydro Units 1-4				102.2 %
N-1: Cabinet - Rathdrum 230 kV + G-1: Upriver Hydro Units 1-5				101.1 %
N-1: Lancaster - Noxon 230 kV + G-1: Boulder Park Thermal Units 1-6				100.3 %
N-1: Lancaster - Noxon 230 kV + G-1: Nine Mile Hydro Units 1-4				101.6 %
N-1: Lancaster - Noxon 230 kV + G-1: Upriver Hydro Units 1-5				100.5 %
N-1: Libby - Noxon 230 kV + G-1: Boulder Park Thermal Units 1-6				100.0 %
N-1: Libby - Noxon 230 kV + G-1: Upriver Hydro Units 1-5				100.2 %
N-1: Noxon - Pine Creek 230 kV + G-1: Boulder Park Thermal Units 1-6				100.2 %
N-1: Noxon - Pine Creek 230 kV + G-1: Nine Mile Hydro Units 1-4				101.5 %
N-1: Noxon - Pine Creek 230 kV + G-1: Upriver Hydro Units 1-5				100.4 %
S-1: Bell 230kV Switched Shunt + G-1: Lancaster Thermal Units 1&2				100.4 %
S-1: Bell 230kV Switched Shunt + G-1: Little Falls Hydro Units 1-4				100.2 %
S-1: Bell 230kV Switched Shunt + G-1: Long Lake Hydro Units 1-4				102.2 %
S-1: Bell 230kV Switched Shunt + G-1: Noxon Rapids Hydro Units 1-5				100.1 %
T-1: Bell #1 500/230 kV + G-1: Cabinet Gorge Hydro Units 1-4				100.0 %
T-1: Bell #1 500/230 kV + G-1: Lancaster Thermal Units 1&2				100.7 %
T-1: Bell #1 500/230 kV + G-1: Libby Hydro Units 1-5				100.0 %
T-1: Bell #1 500/230 kV + G-1: Little Falls Hydro Units 1-4				100.6 %
T-1: Bell #1 500/230 kV + G-1: Long Lake Hydro Units 1-4				102.5 %
T-1: Bell #1 500/230 kV + G-1: Noxon Rapids Hydro Units 1-5				100.5 %
T-1: Hatwai 500/230 kV + G-1: Boulder Park Thermal Units 1-6				105.1 %
T-1: Hatwai 500/230 kV + G-1: Nine Mile Hydro Units 1-4				106.4 %
T-1: Hatwai 500/230 kV + G-1: Upriver Hydro Units 1-5				105.2 %
WEST (48463) -> WEST (48461) CKT 2				
G-1: Lancaster Thermal Units 1&2 + T-1: Westside #1 230/115 kV			102.7 %	116.1 %
G-1: Nine Mile Hydro Units 1-4 + T-1: Westside #1 230/115 kV			102.9 %	116.2 %
G-1: Noxon Rapids Hydro Units 1-5 + T-1: Westside #1 230/115 kV			102.5 %	115.8 %
P5				
WEST (48463) -> WEST (48461) CKT 1				
PSF: Beacon North 115 kV	101.3 %	110.2 %	117.7 %	133.2 %
PSF: Beacon South 115 kV				112.2 %
PSF: Boulder West 115 kV				102.8 %
PSF: Devils Gap East 115 kV			104.4 %	115.5 %
PSF: Nine Mile 115 kV				102.1 %
PSF: Ninth & Central North 115 kV				102.4 %
PSF: Northeast 115 kV				102.4 %
WEST (48463) -> WEST (48461) CKT 2				
PSF: Beacon North 115 kV				102.8 %
P6				
BEACON N (48023) -> ROSSPARK (48371) CKT 1				
T-1: Westside #1 230/115 kV + T-1: Westside #2 230/115 kV				100.8 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				
T-1: Westside #1 230/115 kV + T-1: Westside #2 230/115 kV				112.3 %
WEST (48463) -> WEST (48461) CKT 1				
N-1: 3TM Bell - Boundary #1 230 kV + N-1: 3TM Bell - Boundary #3 230 kV				104.0 %
N-1: 3TM Bell - Boundary #1 230 kV + N-1: Addy - Devils Gap 115 kV				100.7 %
N-1: 3TM Bell - Boundary #1 230 kV + T-1: Addy #3 230/115 kV				105.3 %
N-1: 3TM Bell - Boundary #1 230 kV + T-1: Hatwai 500/230 kV				103.4 %

Row Labels	16HS	20HS	25HS	35HS
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Addy - Bell 115 kV				101.3 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Addy - Bell 115 kV (MLN)				104.5 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Airway Heights - Devils Gap 115 kV				101.4 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Airway Heights - Silver Lake 115 kV				102.4 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Airway Heights - Sunset 115 kV				106.0 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Bell #1 115 kV				106.0 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Bell #4 230 kV				111.9 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Bell #5 230 kV				112.1 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Boulder #1 115 kV				105.1 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Boulder 230 kV				106.5 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Francis & Cedar 115 kV				108.0 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Ninth & Central #1 115 kV				108.2 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Ninth & Central #2 115 kV				108.2 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Northeast 115 kV				105.6 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Rathdrum 230 kV				106.0 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Ross Park 115 kV		101.6 %	108.5 %	122.3 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Bell - Coulee #3 230 kV				106.1 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Bell - Coulee #5 230 kV				106.0 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Bell - Coulee #6 500 kV				106.2 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Bell - Creston 115 kV				106.4 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Bell - Lancaster 230 kV				106.2 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Bell - Northeast 115 kV				111.4 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Bell - Taft 500 kV				105.2 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Bell - Usk 230 kV				104.2 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Benewah - Boulder 230 kV				102.9 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Boulder - Lancaster 230 kV				111.5 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Boulder - Otis Orchards #1 115 kV				105.0 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Boulder - Otis Orchards #2 115 kV				106.1 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Boulder - Post Falls 115 kV				104.9 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				105.7 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Boulder #1 230/115 kV				108.6 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Boulder #2 230/115 kV				108.6 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: College & Walnut - Post Street 115 kV				105.1 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Devils Gap - Nine Mile 115 kV				108.1 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Metro - Post Street 115 kV				107.5 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Metro - Sunset 115 kV				106.9 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Nine Mile - Westside 115 kV				105.5 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				107.8 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Otis Orchards - Post Falls 115 kV				104.8 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Post Street - Third & Hatch 115 kV				113.1 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Ross Park - Third & Hatch 115 kV				109.6 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Shawnee - Sunset 115 kV (SUN-FRL)				102.9 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Trentwood - Vera Tap 115 kV				102.9 %
N-1: 3TM Bell - Boundary #3 230 kV + S-1: Airway Heights 115kV Switched Shunt				105.8 %
N-1: 3TM Bell - Boundary #3 230 kV + S-1: Bell 230kV Switched Shunt				105.6 %
N-1: 3TM Bell - Boundary #3 230 kV + S-1: Colbert 115kV Switched Shunt				105.8 %
N-1: 3TM Bell - Boundary #3 230 kV + S-1: Deer Park 115kV Switched Shunt				105.6 %
N-1: 3TM Bell - Boundary #3 230 kV + S-1: Otis Orchards 115kV Switched Shunt				106.1 %
N-1: 3TM Bell - Boundary #3 230 kV + S-1: Spokane Ind Park 115kV Switched Shunt				105.7 %
N-1: 3TM Bell - Boundary #3 230 kV + S-1: Sunset 115kV Switched Shunt				106.0 %
N-1: 3TM Bell - Boundary #3 230 kV + S-1: Third & Hatch 115kV Switched Shunt				106.8 %
N-1: 3TM Bell - Boundary #3 230 kV + S-1: Trentwood 115kV Switched Shunt				106.2 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Beacon #1 230/115 kV		102.4 %	109.0 %	122.0 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Beacon #2 230/115 kV		102.3 %	108.9 %	121.9 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Bell #1 500/230 kV				105.9 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Bell #6 230/115 kV		104.8 %	111.3 %	125.4 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Boulder Park #1 115/13.8 kV				106.6 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Nine Mile #1 115/2				105.6 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Nine Mile #2 115/13.8 kV				107.1 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Upriver 13.8/2.4 kV				105.7 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Upriver 13.8/4.2 kV				105.9 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Westside #2 230/115 kV	116.8 %	126.5 %	135.0 %	152.1 %
N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV + N-1: Bell - Creston 115 kV				101.8 %
N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV + N-1: Devils Gap - Nine Mile 115 kV				105.2 %
N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV + N-1: Bell - Creston 115 kV				101.8 %
N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV + N-1: Devils Gap - Nine Mile				105.2 %

Row Labels	16HS	20HS	25HS	35HS
115 kV				
N-1: Addy - Bell 115 kV (MLN) + T-1: Noxon #1 230/13.8 kV				100.0 %
N-1: Addy - Bell 115 kV + N-1: Addy - Devils Gap 115 kV				100.1 %
N-1: Addy - Bell 115 kV + T-1: Addy #3 230/115 kV				102.4 %
N-1: Addy - Colville BPA 115 kV + N-1: Bell - Creston 115 kV				100.0 %
N-1: Addy - Devils Gap 115 kV + N-1: Bell - Creston 115 kV				101.7 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Devils Gap - Nine Mile 115 kV			103.9 %	115.1 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Nine Mile - Westside 115 kV			102.4 %	113.2 %
N-1: Airway Heights - Devils Gap 115 kV + T-1: Addy #3 230/115 kV				102.3 %
N-1: Airway Heights - Sunset 115 kV + N-1: Devils Gap - Nine Mile 115 kV				107.0 %
N-1: Airway Heights - Sunset 115 kV + N-1: Nine Mile - Westside 115 kV				105.1 %
N-1: Airway Heights - Sunset 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				100.3 %
N-1: Airway Heights - Sunset 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				100.3 %
N-1: Airway Heights - Sunset 115 kV + T-1: Noxon #1 230/13.8 kV				100.9 %
N-1: Beacon - Bell #1 115 kV + N-1: Beacon - Northeast 115 kV				100.2 %
N-1: Beacon - Bell #1 115 kV + N-1: Bell - Creston 115 kV				100.2 %
N-1: Beacon - Bell #1 115 kV + N-1: Bell - Northeast 115 kV				109.0 %
N-1: Beacon - Bell #1 115 kV + N-1: Boulder - Otis Orchards #2 115 kV				100.2 %
N-1: Beacon - Bell #1 115 kV + N-1: Pine Street - Rathdrum 115 kV (PNST-HOO)				100.2 %
N-1: Beacon - Bell #1 115 kV + S-1: Otis Orchards 115kV Switched Shunt				100.2 %
N-1: Beacon - Bell #1 115 kV + S-1: Sunset 115kV Switched Shunt				100.1 %
N-1: Beacon - Bell #1 115 kV + S-1: Trentwood 115kV Switched Shunt				100.2 %
N-1: Beacon - Bell #1 115 kV + T-1: Beacon #1 230/115 kV			103.4 %	116.6 %
N-1: Beacon - Bell #1 115 kV + T-1: Beacon #2 230/115 kV			103.3 %	116.5 %
N-1: Beacon - Bell #1 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				101.0 %
N-1: Beacon - Bell #1 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				101.0 %
N-1: Beacon - Bell #1 115 kV + T-1: Hungry Horse #1 230/13.8 kV				100.3 %
N-1: Beacon - Bell #1 115 kV + T-1: Hungry Horse #4 230/13.8 kV				100.3 %
N-1: Beacon - Bell #1 115 kV + T-1: Noxon #1 230/13.8 kV				101.6 %
N-1: Beacon - Bell #1 115 kV + T-1: Noxon #2 230/13.8 kV				100.7 %
N-1: Beacon - Bell #1 115 kV + T-1: Post Falls #1 115/2.4 kV				100.0 %
N-1: Beacon - Bell #1 115 kV + T-1: Upriver 13.8/4.2 kV				100.1 %
N-1: Beacon - Bell #4 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				107.2 %
N-1: Beacon - Bell #4 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				107.2 %
N-1: Beacon - Bell #4 230 kV + N-1: Addy - Devils Gap 115 kV				107.4 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Bell #1 115 kV				106.3 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Bell #5 230 kV	102.3 %	114.4 %	122.1 %	137.6 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Boulder 230 kV				105.4 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Francis & Cedar 115 kV				107.1 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Ninth & Central #1 115 kV				107.6 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Ninth & Central #2 115 kV				107.5 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Rathdrum 230 kV				106.3 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Ross Park 115 kV			106.2 %	120.2 %
N-1: Beacon - Bell #4 230 kV + N-1: Bell - Lancaster 230 kV				106.3 %
N-1: Beacon - Bell #4 230 kV + N-1: Bell - Northeast 115 kV				112.2 %
N-1: Beacon - Bell #4 230 kV + N-1: Benewah - Pine Creek 230 kV				107.0 %
N-1: Beacon - Bell #4 230 kV + N-1: Boulder - Lancaster 230 kV			100.2 %	112.5 %
N-1: Beacon - Bell #4 230 kV + N-1: Boulder #1 230/115 kV				107.9 %
N-1: Beacon - Bell #4 230 kV + N-1: Boulder #2 230/115 kV				107.8 %
N-1: Beacon - Bell #4 230 kV + N-1: Cabinet - Rathdrum 230 kV				107.5 %
N-1: Beacon - Bell #4 230 kV + N-1: Devils Gap - Nine Mile 115 kV				110.0 %
N-1: Beacon - Bell #4 230 kV + N-1: Lancaster - Noxon 230 kV				106.6 %
N-1: Beacon - Bell #4 230 kV + N-1: Libby - Noxon 230 kV				106.2 %
N-1: Beacon - Bell #4 230 kV + N-1: Metro - Post Street 115 kV				106.7 %
N-1: Beacon - Bell #4 230 kV + N-1: Metro - Sunset 115 kV				106.1 %
N-1: Beacon - Bell #4 230 kV + N-1: Nine Mile - Westside 115 kV				107.5 %
N-1: Beacon - Bell #4 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				107.0 %
N-1: Beacon - Bell #4 230 kV + N-1: Noxon - Pine Creek 230 kV				106.4 %
N-1: Beacon - Bell #4 230 kV + N-1: Post Street - Third & Hatch 115 kV				111.2 %
N-1: Beacon - Bell #4 230 kV + N-1: Ross Park - Third & Hatch 115 kV				108.6 %
N-1: Beacon - Bell #4 230 kV + S-1: Third & Hatch 115kV Switched Shunt				106.5 %
N-1: Beacon - Bell #4 230 kV + T-1: Addy #3 230/115 kV			100.4 %	112.9 %
N-1: Beacon - Bell #4 230 kV + T-1: Beacon #1 230/115 kV			105.6 %	118.7 %
N-1: Beacon - Bell #4 230 kV + T-1: Beacon #2 230/115 kV			105.3 %	118.3 %
N-1: Beacon - Bell #4 230 kV + T-1: Bell #6 230/115 kV		104.6 %	111.3 %	125.9 %
N-1: Beacon - Bell #4 230 kV + T-1: Boulder Park #1 115/13.8 kV				106.3 %
N-1: Beacon - Bell #4 230 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				106.7 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Beacon - Bell #4 230 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				106.7 %
N-1: Beacon - Bell #4 230 kV + T-1: Hatwai 500/230 kV			100.2 %	112.8 %
N-1: Beacon - Bell #4 230 kV + T-1: Little Falls #1 115/4 kV				107.6 %
N-1: Beacon - Bell #4 230 kV + T-1: Little Falls #2 115/4 kV				106.3 %
N-1: Beacon - Bell #4 230 kV + T-1: Nine Mile #2 115/13.8 kV				106.6 %
N-1: Beacon - Bell #4 230 kV + T-1: Noxon #1 230/13.8 kV				107.4 %
N-1: Beacon - Bell #4 230 kV + T-1: Noxon #2 230/13.8 kV				106.3 %
N-1: Beacon - Bell #4 230 kV + T-1: Westside #2 230/115 kV	114.7 %	125.5 %	134.2 %	151.8 %
N-1: Beacon - Bell #5 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				107.4 %
N-1: Beacon - Bell #5 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				107.4 %
N-1: Beacon - Bell #5 230 kV + N-1: Addy - Devils Gap 115 kV				107.6 %
N-1: Beacon - Bell #5 230 kV + N-1: Beacon - Bell #1 115 kV				106.5 %
N-1: Beacon - Bell #5 230 kV + N-1: Beacon - Boulder 230 kV				105.7 %
N-1: Beacon - Bell #5 230 kV + N-1: Beacon - Francis & Cedar 115 kV				107.3 %
N-1: Beacon - Bell #5 230 kV + N-1: Beacon - Ninth & Central #1 115 kV				107.8 %
N-1: Beacon - Bell #5 230 kV + N-1: Beacon - Ninth & Central #2 115 kV				107.8 %
N-1: Beacon - Bell #5 230 kV + N-1: Beacon - Rathdrum 230 kV				106.6 %
N-1: Beacon - Bell #5 230 kV + N-1: Beacon - Ross Park 115 kV			106.4 %	120.4 %
N-1: Beacon - Bell #5 230 kV + N-1: Bell - Lancaster 230 kV				106.6 %
N-1: Beacon - Bell #5 230 kV + N-1: Bell - Northeast 115 kV				112.5 %
N-1: Beacon - Bell #5 230 kV + N-1: Benewah - Pine Creek 230 kV				107.2 %
N-1: Beacon - Bell #5 230 kV + N-1: Boulder - Lancaster 230 kV			100.5 %	112.7 %
N-1: Beacon - Bell #5 230 kV + N-1: Boulder #1 230/115 kV				108.1 %
N-1: Beacon - Bell #5 230 kV + N-1: Boulder #2 230/115 kV				108.1 %
N-1: Beacon - Bell #5 230 kV + N-1: Cabinet - Rathdrum 230 kV				107.8 %
N-1: Beacon - Bell #5 230 kV + N-1: Devils Gap - Nine Mile 115 kV				110.2 %
N-1: Beacon - Bell #5 230 kV + N-1: Lancaster - Noxon 230 kV				106.8 %
N-1: Beacon - Bell #5 230 kV + N-1: Libby - Noxon 230 kV				106.4 %
N-1: Beacon - Bell #5 230 kV + N-1: Metro - Post Street 115 kV				106.9 %
N-1: Beacon - Bell #5 230 kV + N-1: Metro - Sunset 115 kV				106.3 %
N-1: Beacon - Bell #5 230 kV + N-1: Nine Mile - Westside 115 kV				107.7 %
N-1: Beacon - Bell #5 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				107.2 %
N-1: Beacon - Bell #5 230 kV + N-1: Noxon - Pine Creek 230 kV				106.6 %
N-1: Beacon - Bell #5 230 kV + N-1: Post Street - Third & Hatch 115 kV				111.4 %
N-1: Beacon - Bell #5 230 kV + N-1: Ross Park - Third & Hatch 115 kV				108.9 %
N-1: Beacon - Bell #5 230 kV + S-1: Third & Hatch 115kV Switched Shunt				106.7 %
N-1: Beacon - Bell #5 230 kV + T-1: Addy #3 230/115 kV			100.6 %	113.2 %
N-1: Beacon - Bell #5 230 kV + T-1: Beacon #1 230/115 kV			105.5 %	118.6 %
N-1: Beacon - Bell #5 230 kV + T-1: Beacon #2 230/115 kV			105.6 %	118.6 %
N-1: Beacon - Bell #5 230 kV + T-1: Bell #6 230/115 kV		105.1 %	111.8 %	126.4 %
N-1: Beacon - Bell #5 230 kV + T-1: Boulder Park #1 115/13.8 kV				106.5 %
N-1: Beacon - Bell #5 230 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				106.9 %
N-1: Beacon - Bell #5 230 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				106.9 %
N-1: Beacon - Bell #5 230 kV + T-1: Hatwai 500/230 kV			100.5 %	113.0 %
N-1: Beacon - Bell #5 230 kV + T-1: Little Falls #1 115/4 kV				107.8 %
N-1: Beacon - Bell #5 230 kV + T-1: Little Falls #2 115/4 kV				106.6 %
N-1: Beacon - Bell #5 230 kV + T-1: Nine Mile #2 115/13.8 kV				106.8 %
N-1: Beacon - Bell #5 230 kV + T-1: Noxon #1 230/13.8 kV				107.6 %
N-1: Beacon - Bell #5 230 kV + T-1: Noxon #2 230/13.8 kV				106.5 %
N-1: Beacon - Bell #5 230 kV + T-1: Westside #2 230/115 kV	115.1 %	125.8 %	134.5 %	152.1 %
N-1: Beacon - Boulder #1 115 kV + T-1: Noxon #1 230/13.8 kV				100.2 %
N-1: Beacon - Boulder 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				102.0 %
N-1: Beacon - Boulder 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				102.0 %
N-1: Beacon - Boulder 230 kV + N-1: Addy - Devils Gap 115 kV				102.1 %
N-1: Beacon - Boulder 230 kV + N-1: Beacon - Francis & Cedar 115 kV				102.3 %
N-1: Beacon - Boulder 230 kV + N-1: Beacon - Ninth & Central #1 115 kV				102.7 %
N-1: Beacon - Boulder 230 kV + N-1: Beacon - Ninth & Central #2 115 kV				102.7 %
N-1: Beacon - Boulder 230 kV + N-1: Beacon - Ross Park 115 kV				116.0 %
N-1: Beacon - Boulder 230 kV + N-1: Bell - Lancaster 230 kV				101.0 %
N-1: Beacon - Boulder 230 kV + N-1: Bell - Northeast 115 kV				106.3 %
N-1: Beacon - Boulder 230 kV + N-1: Benewah - Pine Creek 230 kV				102.1 %
N-1: Beacon - Boulder 230 kV + N-1: Boulder - Lancaster 230 kV			100.9 %	112.7 %
N-1: Beacon - Boulder 230 kV + N-1: Boulder #1 230/115 kV				102.3 %
N-1: Beacon - Boulder 230 kV + N-1: Boulder #2 230/115 kV				102.3 %
N-1: Beacon - Boulder 230 kV + N-1: Cabinet - Rathdrum 230 kV				101.8 %
N-1: Beacon - Boulder 230 kV + N-1: Devils Gap - Nine Mile 115 kV				104.8 %
N-1: Beacon - Boulder 230 kV + N-1: Lancaster - Noxon 230 kV				101.3 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Beacon - Boulder 230 kV + N-1: Metro - Post Street 115 kV				101.7 %
N-1: Beacon - Boulder 230 kV + N-1: Metro - Sunset 115 kV				101.1 %
N-1: Beacon - Boulder 230 kV + N-1: Nine Mile - Westside 115 kV				102.4 %
N-1: Beacon - Boulder 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				102.0 %
N-1: Beacon - Boulder 230 kV + N-1: Noxon - Pine Creek 230 kV				101.5 %
N-1: Beacon - Boulder 230 kV + N-1: Post Street - Third & Hatch 115 kV				106.6 %
N-1: Beacon - Boulder 230 kV + N-1: Ross Park - Third & Hatch 115 kV				103.8 %
N-1: Beacon - Boulder 230 kV + S-1: Third & Hatch 115kV Switched Shunt				101.2 %
N-1: Beacon - Boulder 230 kV + T-1: Addy #3 230/115 kV				107.4 %
N-1: Beacon - Boulder 230 kV + T-1: Beacon #1 230/115 kV			104.1 %	117.0 %
N-1: Beacon - Boulder 230 kV + T-1: Beacon #2 230/115 kV			104.1 %	116.9 %
N-1: Beacon - Boulder 230 kV + T-1: Bell #6 230/115 kV			103.7 %	117.3 %
N-1: Beacon - Boulder 230 kV + T-1: Boulder Park #1 115/13.8 kV				101.1 %
N-1: Beacon - Boulder 230 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				101.4 %
N-1: Beacon - Boulder 230 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				101.4 %
N-1: Beacon - Boulder 230 kV + T-1: Hatwai 500/230 kV				107.5 %
N-1: Beacon - Boulder 230 kV + T-1: Little Falls #1 115/4 kV				102.4 %
N-1: Beacon - Boulder 230 kV + T-1: Little Falls #2 115/4 kV				101.2 %
N-1: Beacon - Boulder 230 kV + T-1: Nine Mile #2 115/13.8 kV				101.5 %
N-1: Beacon - Boulder 230 kV + T-1: Noxon #1 230/13.8 kV				102.0 %
N-1: Beacon - Boulder 230 kV + T-1: Noxon #2 230/13.8 kV				101.0 %
N-1: Beacon - Boulder 230 kV + T-1: Westside #2 230/115 kV		118.8 %	127.1 %	143.8 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Beacon - Ninth & Central #1 115 kV				104.3 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Beacon - Ninth & Central #2 115 kV				104.3 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Beacon - Ross Park 115 kV		102.2 %	109.3 %	124.0 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Boulder #1 230/115 kV				104.1 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Boulder #2 230/115 kV				104.0 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Devils Gap - Nine Mile 115 kV				106.5 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Metro - Post Street 115 kV				103.0 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Metro - Sunset 115 kV				102.4 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Nine Mile - Westside 115 kV				104.0 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				103.8 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Post Street - Third & Hatch 115 kV				108.8 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Ross Park - Third & Hatch 115 kV				104.9 %
N-1: Beacon - Francis & Cedar 115 kV + S-1: Third & Hatch 115kV Switched Shunt				102.7 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Beacon #1 230/115 kV			103.2 %	116.1 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Beacon #2 230/115 kV			103.0 %	115.9 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Bell #6 230/115 kV			103.7 %	117.3 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Boulder Park #1 115/13.8 kV				102.3 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				102.5 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				102.5 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Nine Mile #2 115/13.8 kV				102.8 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Noxon #1 230/13.8 kV				103.0 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Westside #2 230/115 kV	111.5 %	121.3 %	129.8 %	147.0 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Beacon - Ninth & Central #2 115 kV				110.8 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Beacon - Ross Park 115 kV		101.5 %	108.5 %	122.9 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Bell - Northeast 115 kV				107.7 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Boulder #1 230/115 kV				104.6 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Boulder #2 230/115 kV				104.5 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Devils Gap - Nine Mile 115 kV				106.4 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Metro - Post Street 115 kV				103.5 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Metro - Sunset 115 kV				102.9 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Nine Mile - Westside 115 kV				103.9 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				102.4 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Post Street - Third & Hatch 115 kV				108.3 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Ross Park - Third & Hatch 115 kV				107.7 %
N-1: Beacon - Ninth & Central #1 115 kV + S-1: Third & Hatch 115kV Switched Shunt				102.9 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Beacon #1 230/115 kV			103.7 %	116.5 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Beacon #2 230/115 kV			103.6 %	116.5 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Bell #6 230/115 kV			104.3 %	118.0 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Boulder Park #1 115/13.8 kV				102.6 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				102.8 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				102.8 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Nine Mile #2 115/13.8 kV				103.1 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Noxon #1 230/13.8 kV				103.4 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Westside #2 230/115 kV	111.1 %	120.9 %	129.3 %	146.3 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Beacon - Ross Park 115 kV		101.2 %	108.2 %	122.6 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Bell - Northeast 115 kV				107.7 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Boulder #1 230/115 kV				104.6 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Boulder #2 230/115 kV				104.5 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Devils Gap - Nine Mile 115 kV				106.4 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Metro - Post Street 115 kV				103.5 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Metro - Sunset 115 kV				102.8 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Nine Mile - Westside 115 kV				103.9 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				102.4 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Post Street - Third & Hatch 115 kV				108.2 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Ross Park - Third & Hatch 115 kV				107.5 %
N-1: Beacon - Ninth & Central #2 115 kV + S-1: Third & Hatch 115kV Switched Shunt				102.9 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Beacon #1 230/115 kV			103.8 %	116.6 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Beacon #2 230/115 kV			103.5 %	116.4 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Bell #6 230/115 kV			104.3 %	118.0 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Boulder Park #1 115/13.8 kV				102.6 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				102.8 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				102.8 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Nine Mile #2 115/13.8 kV				103.1 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Noxon #1 230/13.8 kV				103.4 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Westside #2 230/115 kV	111.1 %	120.9 %	129.3 %	146.3 %
N-1: Beacon - Northeast 115 kV + T-1: Beacon #1 230/115 kV			103.1 %	116.3 %
N-1: Beacon - Northeast 115 kV + T-1: Beacon #2 230/115 kV			102.9 %	116.0 %
N-1: Beacon - Northeast 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				100.6 %
N-1: Beacon - Northeast 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				100.6 %
N-1: Beacon - Northeast 115 kV + T-1: Noxon #1 230/13.8 kV				101.2 %
N-1: Beacon - Northeast 115 kV + T-1: Noxon #2 230/13.8 kV				100.3 %
N-1: Beacon - Rathdrum 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				101.5 %
N-1: Beacon - Rathdrum 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				101.5 %
N-1: Beacon - Rathdrum 230 kV + N-1: Addy - Devils Gap 115 kV				101.5 %
N-1: Beacon - Rathdrum 230 kV + N-1: Beacon - Bell #1 115 kV				100.1 %
N-1: Beacon - Rathdrum 230 kV + N-1: Bell - Creston 115 kV				100.1 %
N-1: Beacon - Rathdrum 230 kV + N-1: Benewah - Pine Creek 230 kV				101.0 %
N-1: Beacon - Rathdrum 230 kV + N-1: Boulder - Lancaster 230 kV				107.8 %
N-1: Beacon - Rathdrum 230 kV + N-1: Cabinet - Rathdrum 230 kV				100.9 %
N-1: Beacon - Rathdrum 230 kV + N-1: Lancaster - Noxon 230 kV				100.4 %
N-1: Beacon - Rathdrum 230 kV + N-1: Libby - Noxon 230 kV				100.2 %
N-1: Beacon - Rathdrum 230 kV + N-1: Noxon - Pine Creek 230 kV				100.5 %
N-1: Beacon - Rathdrum 230 kV + S-1: Trentwood 115kV Switched Shunt				100.0 %
N-1: Beacon - Rathdrum 230 kV + T-1: Addy #3 230/115 kV				106.8 %
N-1: Beacon - Rathdrum 230 kV + T-1: Boundary 230/115 kV				100.3 %
N-1: Beacon - Rathdrum 230 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				100.6 %
N-1: Beacon - Rathdrum 230 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				100.6 %
N-1: Beacon - Rathdrum 230 kV + T-1: Hatwai 500/230 kV				105.2 %
N-1: Beacon - Rathdrum 230 kV + T-1: Little Falls #1 115/4 kV				101.8 %
N-1: Beacon - Rathdrum 230 kV + T-1: Little Falls #2 115/4 kV				100.6 %
N-1: Beacon - Rathdrum 230 kV + T-1: Noxon #1 230/13.8 kV				101.1 %
N-1: Beacon - Rathdrum 230 kV + T-1: Noxon #2 230/13.8 kV				100.3 %
N-1: Beacon - Ross Park 115 kV + N-1: Bell - Northeast 115 kV		100.5 %	107.5 %	121.8 %
N-1: Beacon - Ross Park 115 kV + N-1: Boulder #1 230/115 kV			104.1 %	117.7 %
N-1: Beacon - Ross Park 115 kV + N-1: Boulder #2 230/115 kV			104.0 %	117.7 %
N-1: Beacon - Ross Park 115 kV + N-1: Devils Gap - Nine Mile 115 kV		100.8 %	107.3 %	120.5 %
N-1: Beacon - Ross Park 115 kV + N-1: Metro - Post Street 115 kV				115.2 %
N-1: Beacon - Ross Park 115 kV + N-1: Metro - Sunset 115 kV				115.1 %
N-1: Beacon - Ross Park 115 kV + N-1: Nine Mile - Westside 115 kV			104.8 %	117.7 %
N-1: Beacon - Ross Park 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV	100.1 %	108.5 %	116.1 %	131.8 %
N-1: Beacon - Ross Park 115 kV + N-1: Post Street - Third & Hatch 115 kV			103.3 %	117.5 %
N-1: Beacon - Ross Park 115 kV + N-1: Ross Park - Third & Hatch 115 kV			102.7 %	116.3 %
N-1: Beacon - Ross Park 115 kV + S-1: Third & Hatch 115kV Switched Shunt			103.3 %	116.8 %
N-1: Beacon - Ross Park 115 kV + T-1: Beacon #1 230/115 kV		106.6 %	113.7 %	128.0 %
N-1: Beacon - Ross Park 115 kV + T-1: Beacon #2 230/115 kV		106.6 %	113.7 %	128.0 %
N-1: Beacon - Ross Park 115 kV + T-1: Bell #6 230/115 kV		106.8 %	113.8 %	129.0 %
N-1: Beacon - Ross Park 115 kV + T-1: Boulder Park #1 115/13.8 kV				116.0 %
N-1: Beacon - Ross Park 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV			102.7 %	
N-1: Beacon - Ross Park 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV			102.7 %	
N-1: Beacon - Ross Park 115 kV + T-1: Nine Mile #2 115/13.8 kV			103.2 %	116.7 %
N-1: Beacon - Ross Park 115 kV + T-1: Noxon #1 230/13.8 kV			103.2 %	116.6 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Beacon - Ross Park 115 kV + T-1: Westside #2 230/115 kV	128.8 %	140.1 %	149.8 %	169.8 %
N-1: Bell - Coulee #3 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				101.6 %
N-1: Bell - Coulee #3 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				101.6 %
N-1: Bell - Coulee #3 230 kV + N-1: Addy - Devils Gap 115 kV				101.5 %
N-1: Bell - Coulee #3 230 kV + N-1: Beacon - Bell #1 115 kV				100.2 %
N-1: Bell - Coulee #3 230 kV + N-1: Bell - Coulee #5 230 kV				100.0 %
N-1: Bell - Coulee #3 230 kV + N-1: Bell - Coulee #6 500 kV				100.3 %
N-1: Bell - Coulee #3 230 kV + N-1: Bell - Creston 115 kV				100.2 %
N-1: Bell - Coulee #3 230 kV + N-1: Bell - Lancaster 230 kV				100.1 %
N-1: Bell - Coulee #3 230 kV + N-1: Benewah - Pine Creek 230 kV				101.0 %
N-1: Bell - Coulee #3 230 kV + N-1: Lancaster - Noxon 230 kV				100.6 %
N-1: Bell - Coulee #3 230 kV + N-1: Libby - Noxon 230 kV				100.3 %
N-1: Bell - Coulee #3 230 kV + N-1: Noxon - Pine Creek 230 kV				100.5 %
N-1: Bell - Coulee #3 230 kV + S-1: Trentwood 115kV Switched Shunt				100.1 %
N-1: Bell - Coulee #3 230 kV + T-1: Addy #3 230/115 kV				106.8 %
N-1: Bell - Coulee #3 230 kV + T-1: Bell #1 500/230 kV				100.1 %
N-1: Bell - Coulee #3 230 kV + T-1: Boundary 230/115 kV				100.4 %
N-1: Bell - Coulee #3 230 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				100.8 %
N-1: Bell - Coulee #3 230 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				100.8 %
N-1: Bell - Coulee #3 230 kV + T-1: Hatwai 500/230 kV				105.4 %
N-1: Bell - Coulee #3 230 kV + T-1: Hungry Horse #1 230/13.8 kV				100.0 %
N-1: Bell - Coulee #3 230 kV + T-1: Hungry Horse #4 230/13.8 kV				100.0 %
N-1: Bell - Coulee #3 230 kV + T-1: Little Falls #1 115/4 kV				101.9 %
N-1: Bell - Coulee #3 230 kV + T-1: Little Falls #2 115/4 kV				100.7 %
N-1: Bell - Coulee #3 230 kV + T-1: Noxon #1 230/13.8 kV				101.3 %
N-1: Bell - Coulee #3 230 kV + T-1: Noxon #2 230/13.8 kV				100.4 %
N-1: Bell - Coulee #5 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				101.5 %
N-1: Bell - Coulee #5 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				101.5 %
N-1: Bell - Coulee #5 230 kV + N-1: Addy - Devils Gap 115 kV				101.5 %
N-1: Bell - Coulee #5 230 kV + N-1: Beacon - Bell #1 115 kV				100.1 %
N-1: Bell - Coulee #5 230 kV + N-1: Bell - Coulee #6 500 kV				100.2 %
N-1: Bell - Coulee #5 230 kV + N-1: Bell - Creston 115 kV				100.2 %
N-1: Bell - Coulee #5 230 kV + N-1: Bell - Lancaster 230 kV				100.1 %
N-1: Bell - Coulee #5 230 kV + N-1: Benewah - Pine Creek 230 kV				101.0 %
N-1: Bell - Coulee #5 230 kV + N-1: Cabinet - Rathdrum 230 kV				101.2 %
N-1: Bell - Coulee #5 230 kV + N-1: Lancaster - Noxon 230 kV				100.6 %
N-1: Bell - Coulee #5 230 kV + N-1: Libby - Noxon 230 kV				100.3 %
N-1: Bell - Coulee #5 230 kV + N-1: Noxon - Pine Creek 230 kV				100.5 %
N-1: Bell - Coulee #5 230 kV + S-1: Trentwood 115kV Switched Shunt				100.1 %
N-1: Bell - Coulee #5 230 kV + T-1: Addy #3 230/115 kV				106.8 %
N-1: Bell - Coulee #5 230 kV + T-1: Bell #1 500/230 kV				100.0 %
N-1: Bell - Coulee #5 230 kV + T-1: Boundary 230/115 kV				100.4 %
N-1: Bell - Coulee #5 230 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				100.7 %
N-1: Bell - Coulee #5 230 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				100.7 %
N-1: Bell - Coulee #5 230 kV + T-1: Hatwai 500/230 kV				105.4 %
N-1: Bell - Coulee #5 230 kV + T-1: Hungry Horse #1 230/13.8 kV				100.0 %
N-1: Bell - Coulee #5 230 kV + T-1: Hungry Horse #4 230/13.8 kV				100.0 %
N-1: Bell - Coulee #5 230 kV + T-1: Little Falls #1 115/4 kV				101.9 %
N-1: Bell - Coulee #5 230 kV + T-1: Little Falls #2 115/4 kV				100.7 %
N-1: Bell - Coulee #5 230 kV + T-1: Noxon #1 230/13.8 kV				101.3 %
N-1: Bell - Coulee #5 230 kV + T-1: Noxon #2 230/13.8 kV				100.4 %
N-1: Bell - Coulee #6 500 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				101.6 %
N-1: Bell - Coulee #6 500 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				101.6 %
N-1: Bell - Coulee #6 500 kV + N-1: Addy - Devils Gap 115 kV				101.6 %
N-1: Bell - Coulee #6 500 kV + N-1: Beacon - Bell #1 115 kV				100.2 %
N-1: Bell - Coulee #6 500 kV + N-1: Bell - Creston 115 kV				100.3 %
N-1: Bell - Coulee #6 500 kV + N-1: Bell - Lancaster 230 kV				100.3 %
N-1: Bell - Coulee #6 500 kV + N-1: Benewah - Pine Creek 230 kV				101.0 %
N-1: Bell - Coulee #6 500 kV + N-1: Cabinet - Rathdrum 230 kV				101.3 %
N-1: Bell - Coulee #6 500 kV + N-1: Columbia - Larson 230 kV				100.0 %
N-1: Bell - Coulee #6 500 kV + N-1: Lancaster - Noxon 230 kV				100.7 %
N-1: Bell - Coulee #6 500 kV + N-1: Libby - Noxon 230 kV				100.4 %
N-1: Bell - Coulee #6 500 kV + N-1: Noxon - Pine Creek 230 kV				100.5 %
N-1: Bell - Coulee #6 500 kV + S-1: Trentwood 115kV Switched Shunt				100.1 %
N-1: Bell - Coulee #6 500 kV + T-1: Addy #3 230/115 kV				106.9 %
N-1: Bell - Coulee #6 500 kV + T-1: Boundary 230/115 kV				100.5 %
N-1: Bell - Coulee #6 500 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				101.0 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Bell - Coulee #6 500 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				101.0 %
N-1: Bell - Coulee #6 500 kV + T-1: Dworshak 500/13.2 kV				100.1 %
N-1: Bell - Coulee #6 500 kV + T-1: Hatwai 500/230 kV				105.5 %
N-1: Bell - Coulee #6 500 kV + T-1: Hungry Horse #1 230/13.8 kV				100.2 %
N-1: Bell - Coulee #6 500 kV + T-1: Hungry Horse #4 230/13.8 kV				100.2 %
N-1: Bell - Coulee #6 500 kV + T-1: Little Falls #1 115/4 kV				102.0 %
N-1: Bell - Coulee #6 500 kV + T-1: Little Falls #2 115/4 kV				100.8 %
N-1: Bell - Coulee #6 500 kV + T-1: Noxon #1 230/13.8 kV				101.6 %
N-1: Bell - Coulee #6 500 kV + T-1: Noxon #2 230/13.8 kV				100.6 %
N-1: Bell - Creston 115 kV + N-1: Boulder - Otis Orchards #2 115 kV				100.1 %
N-1: Bell - Creston 115 kV + N-1: Pine Street - Rathdrum 115 kV (PNST-HOO)				100.1 %
N-1: Bell - Creston 115 kV + S-1: Otis Orchards 115kV Switched Shunt				100.2 %
N-1: Bell - Creston 115 kV + S-1: Sunset 115kV Switched Shunt				100.1 %
N-1: Bell - Creston 115 kV + S-1: Trentwood 115kV Switched Shunt				100.3 %
N-1: Bell - Creston 115 kV + T-1: Addy #3 230/115 kV				107.1 %
N-1: Bell - Creston 115 kV + T-1: Bell #6 230/115 kV			104.3 %	118.1 %
N-1: Bell - Creston 115 kV + T-1: Boundary 230/115 kV				100.6 %
N-1: Bell - Creston 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				101.0 %
N-1: Bell - Creston 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				101.0 %
N-1: Bell - Creston 115 kV + T-1: Hungry Horse #1 230/13.8 kV				100.2 %
N-1: Bell - Creston 115 kV + T-1: Hungry Horse #4 230/13.8 kV				100.2 %
N-1: Bell - Creston 115 kV + T-1: Little Falls #1 115/4 kV				102.1 %
N-1: Bell - Creston 115 kV + T-1: Little Falls #2 115/4 kV				100.9 %
N-1: Bell - Creston 115 kV + T-1: Noxon #1 230/13.8 kV				101.6 %
N-1: Bell - Creston 115 kV + T-1: Noxon #2 230/13.8 kV				100.6 %
N-1: Bell - Creston 115 kV + T-1: Upriver 13.8/4.2 kV				100.0 %
N-1: Bell - Lancaster 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				101.7 %
N-1: Bell - Lancaster 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				101.7 %
N-1: Bell - Lancaster 230 kV + N-1: Addy - Devils Gap 115 kV				101.7 %
N-1: Bell - Lancaster 230 kV + N-1: Beacon - Bell #1 115 kV				100.4 %
N-1: Bell - Lancaster 230 kV + N-1: Bell - Creston 115 kV				100.4 %
N-1: Bell - Lancaster 230 kV + N-1: Benewah - Pine Creek 230 kV				100.8 %
N-1: Bell - Lancaster 230 kV + N-1: Boulder - Otis Orchards #2 115 kV				100.1 %
N-1: Bell - Lancaster 230 kV + N-1: Cabinet - Rathdrum 230 kV				101.8 %
N-1: Bell - Lancaster 230 kV + N-1: Columbia - Larson 230 kV				100.1 %
N-1: Bell - Lancaster 230 kV + N-1: Hatwai - North Lewiston 230 kV				100.0 %
N-1: Bell - Lancaster 230 kV + N-1: Lancaster - Noxon 230 kV				101.1 %
N-1: Bell - Lancaster 230 kV + N-1: Libby - Noxon 230 kV				100.0 %
N-1: Bell - Lancaster 230 kV + N-1: Noxon - Pine Creek 230 kV				100.3 %
N-1: Bell - Lancaster 230 kV + N-1: Pine Street - Rathdrum 115 kV (PNST-HOO)				100.3 %
N-1: Bell - Lancaster 230 kV + N-1: Walla Walla - Wanapum 230 kV				100.0 %
N-1: Bell - Lancaster 230 kV + S-1: Otis Orchards 115kV Switched Shunt				100.1 %
N-1: Bell - Lancaster 230 kV + S-1: Sunset 115kV Switched Shunt				100.0 %
N-1: Bell - Lancaster 230 kV + S-1: Trentwood 115kV Switched Shunt				100.3 %
N-1: Bell - Lancaster 230 kV + T-1: Addy #3 230/115 kV				107.1 %
N-1: Bell - Lancaster 230 kV + T-1: Boundary 230/115 kV				100.6 %
N-1: Bell - Lancaster 230 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				101.3 %
N-1: Bell - Lancaster 230 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				101.3 %
N-1: Bell - Lancaster 230 kV + T-1: Dworshak 500/13.2 kV				100.1 %
N-1: Bell - Lancaster 230 kV + T-1: Hatwai 500/230 kV				106.3 %
N-1: Bell - Lancaster 230 kV + T-1: Hungry Horse #1 230/13.8 kV				100.3 %
N-1: Bell - Lancaster 230 kV + T-1: Hungry Horse #4 230/13.8 kV				100.3 %
N-1: Bell - Lancaster 230 kV + T-1: Little Falls #1 115/4 kV				102.1 %
N-1: Bell - Lancaster 230 kV + T-1: Little Falls #2 115/4 kV				100.9 %
N-1: Bell - Lancaster 230 kV + T-1: Noxon #1 230/13.8 kV				102.0 %
N-1: Bell - Lancaster 230 kV + T-1: Noxon #2 230/13.8 kV				100.8 %
N-1: Bell - Northeast 115 kV + N-1: Boulder #1 230/115 kV				108.3 %
N-1: Bell - Northeast 115 kV + N-1: Boulder #2 230/115 kV				108.3 %
N-1: Bell - Northeast 115 kV + N-1: Devils Gap - Nine Mile 115 kV				110.2 %
N-1: Bell - Northeast 115 kV + N-1: Metro - Post Street 115 kV				106.8 %
N-1: Bell - Northeast 115 kV + N-1: Metro - Sunset 115 kV				106.2 %
N-1: Bell - Northeast 115 kV + N-1: Nine Mile - Westside 115 kV				107.8 %
N-1: Bell - Northeast 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				107.3 %
N-1: Bell - Northeast 115 kV + N-1: Post Street - Third & Hatch 115 kV				111.7 %
N-1: Bell - Northeast 115 kV + N-1: Ross Park - Third & Hatch 115 kV				108.7 %
N-1: Bell - Northeast 115 kV + S-1: Third & Hatch 115kV Switched Shunt				106.7 %
N-1: Bell - Northeast 115 kV + T-1: Beacon #1 230/115 kV		102.7 %	109.4 %	123.2 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Bell - Northeast 115 kV + T-1: Beacon #2 230/115 kV		102.4 %	109.2 %	122.9 %
N-1: Bell - Northeast 115 kV + T-1: Bell #6 230/115 kV			104.3 %	117.9 %
N-1: Bell - Northeast 115 kV + T-1: Boulder Park #1 115/13.8 kV				106.3 %
N-1: Bell - Northeast 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				106.5 %
N-1: Bell - Northeast 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				106.5 %
N-1: Bell - Northeast 115 kV + T-1: Nine Mile #2 115/13.8 kV				106.7 %
N-1: Bell - Northeast 115 kV + T-1: Noxon #1 230/13.8 kV				107.1 %
N-1: Bell - Northeast 115 kV + T-1: Westside #2 230/115 kV	115.2 %	125.1 %	133.8 %	151.7 %
N-1: Bell - Taft 500 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				100.8 %
N-1: Bell - Taft 500 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				100.8 %
N-1: Bell - Taft 500 kV + N-1: Addy - Devils Gap 115 kV				100.8 %
N-1: Bell - Taft 500 kV + N-1: Benewah - Pine Creek 230 kV				100.1 %
N-1: Bell - Taft 500 kV + N-1: Cabinet - Rathdrum 230 kV				100.2 %
N-1: Bell - Taft 500 kV + T-1: Addy #3 230/115 kV				106.1 %
N-1: Bell - Taft 500 kV + T-1: Hatwai 500/230 kV				104.3 %
N-1: Bell - Taft 500 kV + T-1: Little Falls #1 115/4 kV				101.1 %
N-1: Bell - Taft 500 kV + T-1: Noxon #1 230/13.8 kV				100.6 %
N-1: Bell - Usk 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				100.3 %
N-1: Bell - Usk 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				100.3 %
N-1: Bell - Usk 230 kV + N-1: Addy - Devils Gap 115 kV				100.7 %
N-1: Bell - Usk 230 kV + T-1: Addy #3 230/115 kV				105.5 %
N-1: Bell - Usk 230 kV + T-1: Hatwai 500/230 kV				104.0 %
N-1: Bell - Usk 230 kV + T-1: Little Falls #1 115/4 kV				100.5 %
N-1: Benewah - Boulder 230 kV + T-1: Addy #3 230/115 kV				103.5 %
N-1: Benewah - Pine Creek 230 kV + N-1: Airway Heights - Sunset 115 kV				100.6 %
N-1: Benewah - Pine Creek 230 kV + N-1: Beacon - Bell #1 115 kV				101.3 %
N-1: Benewah - Pine Creek 230 kV + N-1: Beacon - Francis & Cedar 115 kV				102.8 %
N-1: Benewah - Pine Creek 230 kV + N-1: Beacon - Ninth & Central #1 115 kV				103.1 %
N-1: Benewah - Pine Creek 230 kV + N-1: Beacon - Ninth & Central #2 115 kV				103.1 %
N-1: Benewah - Pine Creek 230 kV + N-1: Beacon - Northeast 115 kV				100.9 %
N-1: Benewah - Pine Creek 230 kV + N-1: Beacon - Ross Park 115 kV			102.9 %	116.4 %
N-1: Benewah - Pine Creek 230 kV + N-1: Bell - Creston 115 kV				101.2 %
N-1: Benewah - Pine Creek 230 kV + N-1: Bell - Northeast 115 kV				106.8 %
N-1: Benewah - Pine Creek 230 kV + N-1: Boulder - Lancaster 230 kV				107.8 %
N-1: Benewah - Pine Creek 230 kV + N-1: Boulder - Otis Orchards #2 115 kV				101.0 %
N-1: Benewah - Pine Creek 230 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				100.7 %
N-1: Benewah - Pine Creek 230 kV + N-1: Boulder #1 230/115 kV				103.2 %
N-1: Benewah - Pine Creek 230 kV + N-1: Boulder #2 230/115 kV				103.2 %
N-1: Benewah - Pine Creek 230 kV + N-1: Devils Gap - Nine Mile 115 kV				105.4 %
N-1: Benewah - Pine Creek 230 kV + N-1: Metro - Post Street 115 kV				102.2 %
N-1: Benewah - Pine Creek 230 kV + N-1: Metro - Sunset 115 kV				101.6 %
N-1: Benewah - Pine Creek 230 kV + N-1: Nine Mile - Westside 115 kV				103.0 %
N-1: Benewah - Pine Creek 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				102.5 %
N-1: Benewah - Pine Creek 230 kV + N-1: Post Street - Third & Hatch 115 kV				107.0 %
N-1: Benewah - Pine Creek 230 kV + N-1: Ross Park - Third & Hatch 115 kV				104.3 %
N-1: Benewah - Pine Creek 230 kV + S-1: Airway Heights 115kV Switched Shunt				100.8 %
N-1: Benewah - Pine Creek 230 kV + S-1: Bell 230kV Switched Shunt				100.5 %
N-1: Benewah - Pine Creek 230 kV + S-1: Colbert 115kV Switched Shunt				100.7 %
N-1: Benewah - Pine Creek 230 kV + S-1: Deer Park 115kV Switched Shunt				100.6 %
N-1: Benewah - Pine Creek 230 kV + S-1: Otis Orchards 115kV Switched Shunt				101.0 %
N-1: Benewah - Pine Creek 230 kV + S-1: Spokane Ind Park 115kV Switched Shunt				100.7 %
N-1: Benewah - Pine Creek 230 kV + S-1: Sunset 115kV Switched Shunt				100.9 %
N-1: Benewah - Pine Creek 230 kV + S-1: Third & Hatch 115kV Switched Shunt				101.8 %
N-1: Benewah - Pine Creek 230 kV + S-1: Trentwood 115kV Switched Shunt				101.1 %
N-1: Benewah - Pine Creek 230 kV + T-1: Beacon #1 230/115 kV			103.6 %	116.1 %
N-1: Benewah - Pine Creek 230 kV + T-1: Beacon #2 230/115 kV			103.4 %	116.0 %
N-1: Benewah - Pine Creek 230 kV + T-1: Bell #1 500/230 kV				100.9 %
N-1: Benewah - Pine Creek 230 kV + T-1: Bell #6 230/115 kV			104.3 %	117.7 %
N-1: Benewah - Pine Creek 230 kV + T-1: Boulder Park #1 115/13.8 kV				101.6 %
N-1: Benewah - Pine Creek 230 kV + T-1: Nine Mile #1 115/2				100.6 %
N-1: Benewah - Pine Creek 230 kV + T-1: Nine Mile #2 115/13.8 kV				102.0 %
N-1: Benewah - Pine Creek 230 kV + T-1: Upriver 13.8/2.4 kV				100.7 %
N-1: Benewah - Pine Creek 230 kV + T-1: Upriver 13.8/4.2 kV				100.9 %
N-1: Benewah - Pine Creek 230 kV + T-1: Westside #2 230/115 kV	110.2 %	119.8 %	127.9 %	144.5 %
N-1: Boulder - Lancaster 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				106.9 %
N-1: Boulder - Lancaster 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115				106.9 %

Row Labels	16HS	20HS	25HS	35HS
kV				
N-1: Boulder - Lancaster 230 kV + N-1: Addy - Devils Gap 115 kV				107.0 %
N-1: Boulder - Lancaster 230 kV + N-1: Beacon - Francis & Cedar 115 kV				106.8 %
N-1: Boulder - Lancaster 230 kV + N-1: Beacon - Ninth & Central #1 115 kV				107.4 %
N-1: Boulder - Lancaster 230 kV + N-1: Beacon - Ninth & Central #2 115 kV				107.4 %
N-1: Boulder - Lancaster 230 kV + N-1: Beacon - Ross Park 115 kV		100.2 %	106.8 %	120.3 %
N-1: Boulder - Lancaster 230 kV + N-1: Bell - Northeast 115 kV				111.4 %
N-1: Boulder - Lancaster 230 kV + N-1: Boulder #1 230/115 kV				106.7 %
N-1: Boulder - Lancaster 230 kV + N-1: Boulder #2 230/115 kV				106.6 %
N-1: Boulder - Lancaster 230 kV + N-1: Devils Gap - Nine Mile 115 kV				109.6 %
N-1: Boulder - Lancaster 230 kV + N-1: Lancaster - Rathdrum 230 kV				107.7 %
N-1: Boulder - Lancaster 230 kV + N-1: Metro - Post Street 115 kV				106.3 %
N-1: Boulder - Lancaster 230 kV + N-1: Metro - Sunset 115 kV				105.8 %
N-1: Boulder - Lancaster 230 kV + N-1: Nine Mile - Westside 115 kV				107.2 %
N-1: Boulder - Lancaster 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				106.5 %
N-1: Boulder - Lancaster 230 kV + N-1: Noxon - Pine Creek 230 kV				107.3 %
N-1: Boulder - Lancaster 230 kV + N-1: Post Street - Third & Hatch 115 kV				110.8 %
N-1: Boulder - Lancaster 230 kV + N-1: Ross Park - Third & Hatch 115 kV				108.4 %
N-1: Boulder - Lancaster 230 kV + S-1: Third & Hatch 115kV Switched Shunt				106.0 %
N-1: Boulder - Lancaster 230 kV + T-1: Addy #3 230/115 kV			100.3 %	112.2 %
N-1: Boulder - Lancaster 230 kV + T-1: Beacon #1 230/115 kV		102.4 %	108.7 %	121.4 %
N-1: Boulder - Lancaster 230 kV + T-1: Beacon #2 230/115 kV		102.1 %	108.5 %	121.1 %
N-1: Boulder - Lancaster 230 kV + T-1: Bell #6 230/115 kV		103.4 %	109.7 %	123.2 %
N-1: Boulder - Lancaster 230 kV + T-1: Boulder Park #1 115/13.8 kV				105.8 %
N-1: Boulder - Lancaster 230 kV + T-1: Hatwai 500/230 kV			100.3 %	112.2 %
N-1: Boulder - Lancaster 230 kV + T-1: Little Falls #1 115/4 kV				107.1 %
N-1: Boulder - Lancaster 230 kV + T-1: Little Falls #2 115/4 kV				105.9 %
N-1: Boulder - Lancaster 230 kV + T-1: Nine Mile #2 115/13.8 kV				106.2 %
N-1: Boulder - Lancaster 230 kV + T-1: Noxon #1 230/13.8 kV				106.0 %
N-1: Boulder - Lancaster 230 kV + T-1: Westside #2 230/115 kV	116.2 %	125.8 %	134.0 %	150.6 %
N-1: Boulder - Otis Orchards #1 115 kV + N-1: Boulder - Otis Orchards #2 115 kV				101.3 %
N-1: Boulder - Otis Orchards #1 115 kV + T-1: Noxon #1 230/13.8 kV				100.2 %
N-1: Boulder - Otis Orchards #2 115 kV + S-1: Trentwood 115kV Switched Shunt				100.1 %
N-1: Boulder - Otis Orchards #2 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				100.7 %
N-1: Boulder - Otis Orchards #2 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				100.7 %
N-1: Boulder - Otis Orchards #2 115 kV + T-1: Hungry Horse #1 230/13.8 kV				100.0 %
N-1: Boulder - Otis Orchards #2 115 kV + T-1: Hungry Horse #4 230/13.8 kV				100.0 %
N-1: Boulder - Otis Orchards #2 115 kV + T-1: Noxon #1 230/13.8 kV				101.3 %
N-1: Boulder - Otis Orchards #2 115 kV + T-1: Noxon #2 230/13.8 kV				100.4 %
N-1: Boulder #1 230/115 kV + N-1: Boulder #2 230/115 kV			101.7 %	114.3 %
N-1: Boulder #1 230/115 kV + N-1: Devils Gap - Nine Mile 115 kV				106.7 %
N-1: Boulder #1 230/115 kV + N-1: Metro - Post Street 115 kV				103.5 %
N-1: Boulder #1 230/115 kV + N-1: Metro - Sunset 115 kV				102.9 %
N-1: Boulder #1 230/115 kV + N-1: Nine Mile - Westside 115 kV				104.3 %
N-1: Boulder #1 230/115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				103.8 %
N-1: Boulder #1 230/115 kV + N-1: Post Street - Third & Hatch 115 kV				108.2 %
N-1: Boulder #1 230/115 kV + N-1: Ross Park - Third & Hatch 115 kV				105.7 %
N-1: Boulder #1 230/115 kV + S-1: Third & Hatch 115kV Switched Shunt				103.2 %
N-1: Boulder #1 230/115 kV + T-1: Beacon #1 230/115 kV			106.2 %	119.1 %
N-1: Boulder #1 230/115 kV + T-1: Beacon #2 230/115 kV			106.1 %	119.0 %
N-1: Boulder #1 230/115 kV + T-1: Bell #6 230/115 kV			106.1 %	119.9 %
N-1: Boulder #1 230/115 kV + T-1: Boulder Park #1 115/13.8 kV				103.1 %
N-1: Boulder #1 230/115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				103.1 %
N-1: Boulder #1 230/115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				103.1 %
N-1: Boulder #1 230/115 kV + T-1: Nine Mile #2 115/13.8 kV				103.4 %
N-1: Boulder #1 230/115 kV + T-1: Noxon #1 230/13.8 kV				103.6 %
N-1: Boulder #1 230/115 kV + T-1: Westside #2 230/115 kV	111.8 %	121.4 %	129.8 %	146.6 %
N-1: Boulder #2 230/115 kV + N-1: Devils Gap - Nine Mile 115 kV				106.7 %
N-1: Boulder #2 230/115 kV + N-1: Metro - Post Street 115 kV				103.5 %
N-1: Boulder #2 230/115 kV + N-1: Metro - Sunset 115 kV				102.9 %
N-1: Boulder #2 230/115 kV + N-1: Nine Mile - Westside 115 kV				104.2 %
N-1: Boulder #2 230/115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				103.7 %
N-1: Boulder #2 230/115 kV + N-1: Post Street - Third & Hatch 115 kV				108.2 %
N-1: Boulder #2 230/115 kV + N-1: Ross Park - Third & Hatch 115 kV				105.6 %
N-1: Boulder #2 230/115 kV + S-1: Third & Hatch 115kV Switched Shunt				103.1 %
N-1: Boulder #2 230/115 kV + T-1: Beacon #1 230/115 kV			106.1 %	119.1 %
N-1: Boulder #2 230/115 kV + T-1: Beacon #2 230/115 kV			106.0 %	118.9 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Boulder #2 230/115 kV + T-1: Bell #6 230/115 kV			106.1 %	119.8 %
N-1: Boulder #2 230/115 kV + T-1: Boulder Park #1 115/13.8 kV				103.1 %
N-1: Boulder #2 230/115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				103.0 %
N-1: Boulder #2 230/115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				103.0 %
N-1: Boulder #2 230/115 kV + T-1: Nine Mile #2 115/13.8 kV				103.3 %
N-1: Boulder #2 230/115 kV + T-1: Noxon #1 230/13.8 kV				103.5 %
N-1: Boulder #2 230/115 kV + T-1: Westside #2 230/115 kV	111.8 %	121.3 %	129.7 %	146.5 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Airway Heights - Sunset 115 kV				100.7 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Beacon - Bell #1 115 kV				101.5 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Beacon - Boulder #1 115 kV				100.1 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Beacon - Francis & Cedar 115 kV				102.9 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Beacon - Ninth & Central #1 115 kV				103.3 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Beacon - Ninth & Central #2 115 kV				103.3 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Beacon - Northeast 115 kV				101.1 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Beacon - Ross Park 115 kV			103.0 %	116.5 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Bell - Creston 115 kV				101.4 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Bell - Northeast 115 kV				107.0 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Boulder - Otis Orchards #1 115 kV				100.1 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Boulder - Otis Orchards #2 115 kV				101.2 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Boulder - Post Falls 115 kV				100.1 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				100.9 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Boulder #1 230/115 kV				103.5 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Boulder #2 230/115 kV				103.5 %
N-1: Cabinet - Rathdrum 230 kV + N-1: College & Walnut - Post Street 115 kV				100.1 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Devils Gap - Nine Mile 115 kV				105.6 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Metro - Post Street 115 kV				102.4 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Metro - Sunset 115 kV				101.8 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Nine Mile - Westside 115 kV				103.2 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				102.7 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Post Street - Third & Hatch 115 kV				107.2 %
N-1: Cabinet - Rathdrum 230 kV + N-1: Ross Park - Third & Hatch 115 kV				104.4 %
N-1: Cabinet - Rathdrum 230 kV + S-1: Airway Heights 115kV Switched Shunt				101.0 %
N-1: Cabinet - Rathdrum 230 kV + S-1: Bell 230kV Switched Shunt				100.7 %
N-1: Cabinet - Rathdrum 230 kV + S-1: Colbert 115kV Switched Shunt				100.9 %
N-1: Cabinet - Rathdrum 230 kV + S-1: Deer Park 115kV Switched Shunt				100.7 %
N-1: Cabinet - Rathdrum 230 kV + S-1: Otis Orchards 115kV Switched Shunt				101.2 %
N-1: Cabinet - Rathdrum 230 kV + S-1: Spokane Ind Park 115kV Switched Shunt				100.9 %
N-1: Cabinet - Rathdrum 230 kV + S-1: Sunset 115kV Switched Shunt				101.1 %
N-1: Cabinet - Rathdrum 230 kV + S-1: Third & Hatch 115kV Switched Shunt				101.9 %
N-1: Cabinet - Rathdrum 230 kV + S-1: Trentwood 115kV Switched Shunt				101.3 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Beacon #1 230/115 kV			103.4 %	116.0 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Beacon #2 230/115 kV			103.3 %	115.9 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Bell #1 500/230 kV				101.3 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Bell #6 230/115 kV			104.4 %	117.8 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Boulder Park #1 115/13.8 kV				101.8 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Nine Mile #1 115/2				100.7 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Nine Mile #2 115/13.8 kV				102.2 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Upriver 13.8/2.4 kV				100.8 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Upriver 13.8/4.2 kV				101.1 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Westside #2 230/115 kV	110.6 %	120.0 %	128.2 %	144.8 %
N-1: College & Walnut - Post Street 115 kV + N-1: Metro - Post Street 115 kV				103.0 %
N-1: College & Walnut - Post Street 115 kV + N-1: Metro - Sunset 115 kV				101.4 %
N-1: College & Walnut - Post Street 115 kV + T-1: Noxon #1 230/13.8 kV				100.2 %
N-1: College & Walnut - Post Street 115 kV + T-1: Westside #2 230/115 kV	109.4 %	119.2 %	127.5 %	144.3 %
N-1: Columbia - Larson 230 kV + N-1: Beacon - Bell #1 115 kV				100.1 %
N-1: Columbia - Larson 230 kV + N-1: Bell - Creston 115 kV				100.1 %
N-1: Columbia - Larson 230 kV + S-1: Trentwood 115kV Switched Shunt				100.0 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Metro - Post Street 115 kV				104.9 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Metro - Sunset 115 kV				104.5 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				106.0 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Post Street - Third & Hatch 115 kV				110.3 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Ross Park - Third & Hatch 115 kV				107.4 %
N-1: Devils Gap - Nine Mile 115 kV + S-1: Third & Hatch 115kV Switched Shunt				105.2 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Addy #3 230/115 kV				108.6 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Beacon #1 230/115 kV		101.0 %	107.1 %	119.4 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Beacon #2 230/115 kV		100.9 %	107.0 %	119.3 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Bell #6 230/115 kV		101.4 %	107.4 %	120.5 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Devils Gap - Nine Mile 115 kV + T-1: Boulder Park #1 115/13.8 kV				104.9 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				105.1 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				105.1 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Little Falls #1 115/4 kV				105.4 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Nine Mile #2 115/13.8 kV				105.5 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Noxon #1 230/13.8 kV				105.7 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Westside #2 230/115 kV	116.5 %	126.0 %	133.9 %	150.2 %
N-1: Hatwai - North Lewiston 230 kV + N-1: Beacon - Bell #1 115 kV				100.1 %
N-1: Hatwai - North Lewiston 230 kV + N-1: Bell - Creston 115 kV				100.0 %
N-1: Lancaster - Noxon 230 kV + N-1: Airway Heights - Sunset 115 kV				100.2 %
N-1: Lancaster - Noxon 230 kV + N-1: Beacon - Bell #1 115 kV				100.9 %
N-1: Lancaster - Noxon 230 kV + N-1: Beacon - Francis & Cedar 115 kV				102.4 %
N-1: Lancaster - Noxon 230 kV + N-1: Beacon - Ninth & Central #1 115 kV				102.7 %
N-1: Lancaster - Noxon 230 kV + N-1: Beacon - Ninth & Central #2 115 kV				102.7 %
N-1: Lancaster - Noxon 230 kV + N-1: Beacon - Northeast 115 kV				100.5 %
N-1: Lancaster - Noxon 230 kV + N-1: Bell - Creston 115 kV				100.8 %
N-1: Lancaster - Noxon 230 kV + N-1: Bell - Northeast 115 kV				106.4 %
N-1: Lancaster - Noxon 230 kV + N-1: Boulder - Otis Orchards #2 115 kV				100.6 %
N-1: Lancaster - Noxon 230 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				100.3 %
N-1: Lancaster - Noxon 230 kV + N-1: Boulder #1 230/115 kV				102.9 %
N-1: Lancaster - Noxon 230 kV + N-1: Boulder #2 230/115 kV				102.9 %
N-1: Lancaster - Noxon 230 kV + N-1: Devils Gap - Nine Mile 115 kV				105.0 %
N-1: Lancaster - Noxon 230 kV + N-1: Metro - Post Street 115 kV				101.8 %
N-1: Lancaster - Noxon 230 kV + N-1: Metro - Sunset 115 kV				101.2 %
N-1: Lancaster - Noxon 230 kV + N-1: Nine Mile - Westside 115 kV				102.6 %
N-1: Lancaster - Noxon 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				102.2 %
N-1: Lancaster - Noxon 230 kV + N-1: Ross Park - Third & Hatch 115 kV				103.9 %
N-1: Lancaster - Noxon 230 kV + S-1: Airway Heights 115kV Switched Shunt				100.4 %
N-1: Lancaster - Noxon 230 kV + S-1: Bell 230kV Switched Shunt				100.1 %
N-1: Lancaster - Noxon 230 kV + S-1: Colbert 115kV Switched Shunt				100.3 %
N-1: Lancaster - Noxon 230 kV + S-1: Deer Park 115kV Switched Shunt				100.2 %
N-1: Lancaster - Noxon 230 kV + S-1: Otis Orchards 115kV Switched Shunt				100.6 %
N-1: Lancaster - Noxon 230 kV + S-1: Spokane Ind Park 115kV Switched Shunt				100.3 %
N-1: Lancaster - Noxon 230 kV + S-1: Sunset 115kV Switched Shunt				100.5 %
N-1: Lancaster - Noxon 230 kV + S-1: Third & Hatch 115kV Switched Shunt				101.4 %
N-1: Lancaster - Noxon 230 kV + S-1: Trentwood 115kV Switched Shunt				100.8 %
N-1: Lancaster - Noxon 230 kV + T-1: Beacon #2 230/115 kV			102.8 %	
N-1: Lancaster - Noxon 230 kV + T-1: Bell #1 500/230 kV				100.7 %
N-1: Lancaster - Noxon 230 kV + T-1: Bell #6 230/115 kV			103.7 %	117.1 %
N-1: Lancaster - Noxon 230 kV + T-1: Boulder Park #1 115/13.8 kV				101.2 %
N-1: Lancaster - Noxon 230 kV + T-1: Nine Mile #1 115/2				100.2 %
N-1: Lancaster - Noxon 230 kV + T-1: Nine Mile #2 115/13.8 kV				101.6 %
N-1: Lancaster - Noxon 230 kV + T-1: Upriver 13.8/2.4 kV				100.3 %
N-1: Lancaster - Noxon 230 kV + T-1: Upriver 13.8/4.2 kV				100.5 %
N-1: Lancaster - Noxon 230 kV + T-1: Westside #2 230/115 kV	109.7 %	119.2 %	127.3 %	143.9 %
N-1: Libby - Noxon 230 kV + N-1: Beacon - Bell #1 115 kV				100.6 %
N-1: Libby - Noxon 230 kV + N-1: Beacon - Northeast 115 kV				100.2 %
N-1: Libby - Noxon 230 kV + N-1: Bell - Creston 115 kV				100.5 %
N-1: Libby - Noxon 230 kV + N-1: Boulder - Otis Orchards #2 115 kV				100.3 %
N-1: Libby - Noxon 230 kV + S-1: Airway Heights 115kV Switched Shunt				100.1 %
N-1: Libby - Noxon 230 kV + S-1: Colbert 115kV Switched Shunt				100.0 %
N-1: Libby - Noxon 230 kV + S-1: Otis Orchards 115kV Switched Shunt				100.3 %
N-1: Libby - Noxon 230 kV + S-1: Sunset 115kV Switched Shunt				100.2 %
N-1: Libby - Noxon 230 kV + S-1: Trentwood 115kV Switched Shunt				100.5 %
N-1: Libby - Noxon 230 kV + T-1: Bell #1 500/230 kV				100.2 %
N-1: Libby - Noxon 230 kV + T-1: Upriver 13.8/4.2 kV				100.2 %
N-1: Libby - Noxon 230 kV + T-1: Westside #2 230/115 kV	109.4 %			
N-1: Metro - Post Street 115 kV + N-1: Nine Mile - Westside 115 kV				102.4 %
N-1: Metro - Post Street 115 kV + N-1: Post Street - Third & Hatch 115 kV				104.0 %
N-1: Metro - Post Street 115 kV + N-1: Ross Park - Third & Hatch 115 kV				103.3 %
N-1: Metro - Post Street 115 kV + S-1: Third & Hatch 115kV Switched Shunt				102.0 %
N-1: Metro - Post Street 115 kV + T-1: Beacon #1 230/115 kV			103.1 %	115.9 %
N-1: Metro - Post Street 115 kV + T-1: Beacon #2 230/115 kV			103.0 %	115.8 %
N-1: Metro - Post Street 115 kV + T-1: Bell #6 230/115 kV			103.7 %	117.3 %
N-1: Metro - Post Street 115 kV + T-1: Boulder Park #1 115/13.8 kV				101.7 %
N-1: Metro - Post Street 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				101.9 %
N-1: Metro - Post Street 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				101.9 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Metro - Post Street 115 kV + T-1: Nine Mile #2 115/13.8 kV				102.2 %
N-1: Metro - Post Street 115 kV + T-1: Noxon #1 230/13.8 kV				102.5 %
N-1: Metro - Post Street 115 kV + T-1: Westside #2 230/115 kV	109.7 %	119.5 %	127.9 %	144.9 %
N-1: Metro - Sunset 115 kV + N-1: Nine Mile - Westside 115 kV				102.0 %
N-1: Metro - Sunset 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				101.4 %
N-1: Metro - Sunset 115 kV + N-1: Post Street - Third & Hatch 115 kV				105.9 %
N-1: Metro - Sunset 115 kV + N-1: Ross Park - Third & Hatch 115 kV				103.0 %
N-1: Metro - Sunset 115 kV + S-1: Third & Hatch 115kV Switched Shunt				101.4 %
N-1: Metro - Sunset 115 kV + T-1: Beacon #1 230/115 kV				115.4 %
N-1: Metro - Sunset 115 kV + T-1: Beacon #2 230/115 kV				115.3 %
N-1: Metro - Sunset 115 kV + T-1: Bell #6 230/115 kV				116.8 %
N-1: Metro - Sunset 115 kV + T-1: Boulder Park #1 115/13.8 kV				101.1 %
N-1: Metro - Sunset 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				101.3 %
N-1: Metro - Sunset 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				101.3 %
N-1: Metro - Sunset 115 kV + T-1: Nine Mile #2 115/13.8 kV				101.6 %
N-1: Metro - Sunset 115 kV + T-1: Noxon #1 230/13.8 kV				101.9 %
N-1: Metro - Sunset 115 kV + T-1: Westside #2 230/115 kV		118.8 %	127.1 %	144.0 %
N-1: Nine Mile - Westside 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				103.5 %
N-1: Nine Mile - Westside 115 kV + N-1: Post Street - Third & Hatch 115 kV				107.5 %
N-1: Nine Mile - Westside 115 kV + N-1: Ross Park - Third & Hatch 115 kV				104.9 %
N-1: Nine Mile - Westside 115 kV + S-1: Third & Hatch 115kV Switched Shunt				102.8 %
N-1: Nine Mile - Westside 115 kV + T-1: Beacon #1 230/115 kV			104.8 %	116.9 %
N-1: Nine Mile - Westside 115 kV + T-1: Beacon #2 230/115 kV			104.7 %	116.7 %
N-1: Nine Mile - Westside 115 kV + T-1: Bell #6 230/115 kV			105.2 %	118.0 %
N-1: Nine Mile - Westside 115 kV + T-1: Boulder Park #1 115/13.8 kV				102.5 %
N-1: Nine Mile - Westside 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				102.7 %
N-1: Nine Mile - Westside 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				102.7 %
N-1: Nine Mile - Westside 115 kV + T-1: Nine Mile #2 115/13.8 kV				102.1 %
N-1: Nine Mile - Westside 115 kV + T-1: Noxon #1 230/13.8 kV				103.3 %
N-1: Nine Mile - Westside 115 kV + T-1: Westside #2 230/115 kV	113.7 %	123.0 %	130.8 %	146.6 %
N-1: Ninth & Central - Sunset 115 kV + N-1: Post Street - Third & Hatch 115 kV				108.0 %
N-1: Ninth & Central - Third & Hatch 115 kV + N-1: Post Street - Third & Hatch 115 kV				105.8 %
N-1: Ninth & Central - Third & Hatch 115 kV + N-1: Ross Park - Third & Hatch 115 kV				113.2 %
N-1: Ninth & Central - Third & Hatch 115 kV + S-1: Third & Hatch 115kV Switched Shunt				102.4 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Beacon #1 230/115 kV			103.4 %	116.3 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Beacon #2 230/115 kV			103.2 %	116.1 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Bell #6 230/115 kV			104.0 %	117.6 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Boulder Park #1 115/13.8 kV				102.0 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				102.3 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				102.3 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Nine Mile #2 115/13.8 kV				102.6 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Noxon #1 230/13.8 kV				102.8 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Westside #2 230/115 kV	110.9 %	120.5 %	128.9 %	146.0 %
N-1: Noxon - Pine Creek 230 kV + N-1: Airway Heights - Sunset 115 kV				100.1 %
N-1: Noxon - Pine Creek 230 kV + N-1: Beacon - Bell #1 115 kV				100.8 %
N-1: Noxon - Pine Creek 230 kV + N-1: Beacon - Ninth & Central #1 115 kV				102.7 %
N-1: Noxon - Pine Creek 230 kV + N-1: Beacon - Ninth & Central #2 115 kV				102.6 %
N-1: Noxon - Pine Creek 230 kV + N-1: Beacon - Northeast 115 kV				100.4 %
N-1: Noxon - Pine Creek 230 kV + N-1: Bell - Creston 115 kV				100.7 %
N-1: Noxon - Pine Creek 230 kV + N-1: Bell - Northeast 115 kV				106.3 %
N-1: Noxon - Pine Creek 230 kV + N-1: Boulder - Otis Orchards #2 115 kV				100.5 %
N-1: Noxon - Pine Creek 230 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				100.2 %
N-1: Noxon - Pine Creek 230 kV + N-1: Metro - Post Street 115 kV				101.7 %
N-1: Noxon - Pine Creek 230 kV + N-1: Metro - Sunset 115 kV				101.1 %
N-1: Noxon - Pine Creek 230 kV + N-1: Nine Mile - Westside 115 kV				102.5 %
N-1: Noxon - Pine Creek 230 kV + S-1: Airway Heights 115kV Switched Shunt				100.3 %
N-1: Noxon - Pine Creek 230 kV + S-1: Bell 230kV Switched Shunt				100.0 %
N-1: Noxon - Pine Creek 230 kV + S-1: Colbert 115kV Switched Shunt				100.2 %
N-1: Noxon - Pine Creek 230 kV + S-1: Deer Park 115kV Switched Shunt				100.1 %
N-1: Noxon - Pine Creek 230 kV + S-1: Otis Orchards 115kV Switched Shunt				100.6 %
N-1: Noxon - Pine Creek 230 kV + S-1: Spokane Ind Park 115kV Switched Shunt				100.2 %
N-1: Noxon - Pine Creek 230 kV + S-1: Sunset 115kV Switched Shunt				100.5 %
N-1: Noxon - Pine Creek 230 kV + S-1: Trentwood 115kV Switched Shunt				100.7 %
N-1: Noxon - Pine Creek 230 kV + T-1: Beacon #1 230/115 kV			103.1 %	115.7 %
N-1: Noxon - Pine Creek 230 kV + T-1: Beacon #2 230/115 kV			102.9 %	115.5 %
N-1: Noxon - Pine Creek 230 kV + T-1: Bell #1 500/230 kV				100.4 %
N-1: Noxon - Pine Creek 230 kV + T-1: Bell #6 230/115 kV			103.8 %	117.2 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Noxon - Pine Creek 230 kV + T-1: Boulder Park #1 115/13.8 kV				101.1 %
N-1: Noxon - Pine Creek 230 kV + T-1: Nine Mile #1 115/2				100.1 %
N-1: Noxon - Pine Creek 230 kV + T-1: Nine Mile #2 115/13.8 kV				101.5 %
N-1: Noxon - Pine Creek 230 kV + T-1: Upriver 13.8/2.4 kV				100.2 %
N-1: Noxon - Pine Creek 230 kV + T-1: Upriver 13.8/4.2 kV				100.4 %
N-1: Noxon - Pine Creek 230 kV + T-1: Westside #2 230/115 kV	109.6 %	119.1 %	127.3 %	143.8 %
N-1: Otis Orchards - Post Falls 115 kV + T-1: Noxon #1 230/13.8 kV				100.1 %
N-1: Pine Street - Rathdrum 115 kV (PNST-HOO) + S-1: Trentwood 115kV Switched Shunt				100.1 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Ross Park - Third & Hatch 115 kV				105.2 %
N-1: Post Street - Third & Hatch 115 kV + S-1: Third & Hatch 115kV Switched Shunt				107.3 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Beacon #1 230/115 kV			105.8 %	119.6 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Beacon #2 230/115 kV			105.7 %	119.5 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Bell #6 230/115 kV			105.9 %	120.5 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Boulder Park #1 115/13.8 kV				106.6 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				106.8 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				106.8 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Nine Mile #2 115/13.8 kV				107.4 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Noxon #1 230/13.8 kV				107.3 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Westside #2 230/115 kV	115.9 %	126.9 %	136.2 %	155.1 %
N-1: Ross Park - Third & Hatch 115 kV + S-1: Third & Hatch 115kV Switched Shunt				103.9 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Beacon #1 230/115 kV			104.6 %	117.6 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Beacon #2 230/115 kV			104.5 %	117.6 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Bell #6 230/115 kV			105.3 %	119.1 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Boulder Park #1 115/13.8 kV				103.8 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				104.0 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				104.0 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Nine Mile #2 115/13.8 kV				104.3 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Noxon #1 230/13.8 kV				104.5 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Westside #2 230/115 kV	112.6 %	122.4 %	130.9 %	148.3 %
N-1: Walla Walla - Wanapum 230 kV + N-1: Beacon - Bell #1 115 kV				100.1 %
N-1: Walla Walla - Wanapum 230 kV + N-1: Bell - Creston 115 kV				100.0 %
N-1: Walla Walla - Wanapum 230 kV + S-1: Trentwood 115kV Switched Shunt				100.0 %
S-1: Airway Heights 115kV Switched Shunt + T-1: Cabinet Gorge (12) 230/13.8 kV				100.5 %
S-1: Airway Heights 115kV Switched Shunt + T-1: Cabinet Gorge (34) 230/13.8 kV				100.5 %
S-1: Airway Heights 115kV Switched Shunt + T-1: Noxon #1 230/13.8 kV				101.1 %
S-1: Airway Heights 115kV Switched Shunt + T-1: Noxon #2 230/13.8 kV				100.2 %
S-1: Bell 230kV Switched Shunt + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				101.1 %
S-1: Bell 230kV Switched Shunt + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				101.1 %
S-1: Bell 230kV Switched Shunt + N-1: Addy - Devils Gap 115 kV				101.0 %
S-1: Bell 230kV Switched Shunt + T-1: Addy #3 230/115 kV				106.4 %
S-1: Bell 230kV Switched Shunt + T-1: Cabinet Gorge (12) 230/13.8 kV				100.3 %
S-1: Bell 230kV Switched Shunt + T-1: Cabinet Gorge (34) 230/13.8 kV				100.3 %
S-1: Bell 230kV Switched Shunt + T-1: Hatwai 500/230 kV				104.9 %
S-1: Bell 230kV Switched Shunt + T-1: Little Falls #1 115/4 kV				101.4 %
S-1: Bell 230kV Switched Shunt + T-1: Little Falls #2 115/4 kV				100.2 %
S-1: Bell 230kV Switched Shunt + T-1: Noxon #1 230/13.8 kV				100.8 %
S-1: Colbert 115kV Switched Shunt + T-1: Cabinet Gorge (12) 230/13.8 kV				100.5 %
S-1: Colbert 115kV Switched Shunt + T-1: Cabinet Gorge (34) 230/13.8 kV				100.5 %
S-1: Colbert 115kV Switched Shunt + T-1: Noxon #1 230/13.8 kV				101.0 %
S-1: Colbert 115kV Switched Shunt + T-1: Noxon #2 230/13.8 kV				100.1 %
S-1: Deer Park 115kV Switched Shunt + T-1: Cabinet Gorge (12) 230/13.8 kV				100.3 %
S-1: Deer Park 115kV Switched Shunt + T-1: Cabinet Gorge (34) 230/13.8 kV				100.3 %
S-1: Deer Park 115kV Switched Shunt + T-1: Noxon #1 230/13.8 kV				100.8 %
S-1: Otis Orchards 115kV Switched Shunt + S-1: Sunset 115kV Switched Shunt				100.0 %
S-1: Otis Orchards 115kV Switched Shunt + S-1: Trentwood 115kV Switched Shunt				100.2 %
S-1: Otis Orchards 115kV Switched Shunt + T-1: Cabinet Gorge (12) 230/13.8 kV				100.8 %
S-1: Otis Orchards 115kV Switched Shunt + T-1: Cabinet Gorge (34) 230/13.8 kV				100.8 %
S-1: Otis Orchards 115kV Switched Shunt + T-1: Hungry Horse #1 230/13.8 kV				100.1 %
S-1: Otis Orchards 115kV Switched Shunt + T-1: Hungry Horse #4 230/13.8 kV				100.1 %
S-1: Otis Orchards 115kV Switched Shunt + T-1: Noxon #1 230/13.8 kV				101.3 %
S-1: Otis Orchards 115kV Switched Shunt + T-1: Noxon #2 230/13.8 kV				100.4 %
S-1: Spokane Ind Park 115kV Switched Shunt + T-1: Cabinet Gorge (12) 230/13.8 kV				100.4 %
S-1: Spokane Ind Park 115kV Switched Shunt + T-1: Cabinet Gorge (34) 230/13.8 kV				100.4 %
S-1: Spokane Ind Park 115kV Switched Shunt + T-1: Noxon #1 230/13.8 kV				101.0 %
S-1: Spokane Ind Park 115kV Switched Shunt + T-1: Noxon #2 230/13.8 kV				100.1 %
S-1: Sunset 115kV Switched Shunt + S-1: Trentwood 115kV Switched Shunt				100.1 %

Row Labels	16HS	20HS	25HS	35HS
S-1: Sunset 115kV Switched Shunt + T-1: Cabinet Gorge (12) 230/13.8 kV				100.7 %
S-1: Sunset 115kV Switched Shunt + T-1: Cabinet Gorge (34) 230/13.8 kV				100.7 %
S-1: Sunset 115kV Switched Shunt + T-1: Noxon #1 230/13.8 kV				101.2 %
S-1: Sunset 115kV Switched Shunt + T-1: Noxon #2 230/13.8 kV				100.4 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Beacon #1 230/115 kV			103.7 %	116.3 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Beacon #2 230/115 kV			103.6 %	116.1 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Bell #6 230/115 kV				117.1 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Boulder Park #1 115/13.8 kV				101.3 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Cabinet Gorge (12) 230/13.8 kV				101.5 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Cabinet Gorge (34) 230/13.8 kV				101.5 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Nine Mile #2 115/13.8 kV				101.8 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Noxon #1 230/13.8 kV				102.0 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Westside #2 230/115 kV		119.3 %	127.6 %	144.2 %
S-1: Trentwood 115kV Switched Shunt + T-1: Cabinet Gorge (12) 230/13.8 kV				100.9 %
S-1: Trentwood 115kV Switched Shunt + T-1: Cabinet Gorge (34) 230/13.8 kV				100.9 %
S-1: Trentwood 115kV Switched Shunt + T-1: Hungry Horse #1 230/13.8 kV				100.2 %
S-1: Trentwood 115kV Switched Shunt + T-1: Hungry Horse #4 230/13.8 kV				100.2 %
S-1: Trentwood 115kV Switched Shunt + T-1: Noxon #1 230/13.8 kV				101.4 %
S-1: Trentwood 115kV Switched Shunt + T-1: Noxon #2 230/13.8 kV				100.6 %
T-1: Beacon #1 230/115 kV + T-1: Beacon #2 230/115 kV	117.9 %	128.7 %	136.5 %	151.8 %
T-1: Beacon #1 230/115 kV + T-1: Bell #6 230/115 kV	111.2 %	118.8 %	126.0 %	141.7 %
T-1: Beacon #1 230/115 kV + T-1: Boulder #1 230/115 kV		101.2 %		
T-1: Beacon #1 230/115 kV + T-1: Boulder Park #1 115/13.8 kV			103.0 %	115.6 %
T-1: Beacon #1 230/115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV			103.1 %	115.6 %
T-1: Beacon #1 230/115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV			103.1 %	115.6 %
T-1: Beacon #1 230/115 kV + T-1: Nine Mile #2 115/13.8 kV			103.5 %	116.0 %
T-1: Beacon #1 230/115 kV + T-1: Noxon #1 230/13.8 kV			103.6 %	116.2 %
T-1: Beacon #1 230/115 kV + T-1: Westside #2 230/115 kV	127.4 %	138.8 %	148.0 %	166.4 %
T-1: Beacon #2 230/115 kV + T-1: Bell #6 230/115 kV	111.0 %	118.6 %	125.8 %	141.5 %
T-1: Beacon #2 230/115 kV + T-1: Boulder #1 230/115 kV		101.0 %		
T-1: Beacon #2 230/115 kV + T-1: Boulder Park #1 115/13.8 kV			102.9 %	115.5 %
T-1: Beacon #2 230/115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV			102.9 %	115.5 %
T-1: Beacon #2 230/115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV			102.9 %	115.5 %
T-1: Beacon #2 230/115 kV + T-1: Nine Mile #2 115/13.8 kV			103.3 %	115.9 %
T-1: Beacon #2 230/115 kV + T-1: Noxon #1 230/13.8 kV			103.5 %	116.1 %
T-1: Beacon #2 230/115 kV + T-1: Westside #2 230/115 kV	127.2 %	138.7 %	147.8 %	166.2 %
T-1: Bell #1 500/230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				101.5 %
T-1: Bell #1 500/230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				101.5 %
T-1: Bell #1 500/230 kV + N-1: Addy - Devils Gap 115 kV				101.4 %
T-1: Bell #1 500/230 kV + N-1: Bell - Creston 115 kV				100.2 %
T-1: Bell #1 500/230 kV + T-1: Addy #3 230/115 kV				106.7 %
T-1: Bell #1 500/230 kV + T-1: Boundary 230/115 kV				100.3 %
T-1: Bell #1 500/230 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				100.6 %
T-1: Bell #1 500/230 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				100.6 %
T-1: Bell #1 500/230 kV + T-1: Hatwai 500/230 kV				105.9 %
T-1: Bell #1 500/230 kV + T-1: Little Falls #1 115/4 kV				101.8 %
T-1: Bell #1 500/230 kV + T-1: Little Falls #2 115/4 kV				100.6 %
T-1: Bell #1 500/230 kV + T-1: Noxon #1 230/13.8 kV				101.2 %
T-1: Bell #1 500/230 kV + T-1: Noxon #2 230/13.8 kV				100.3 %
T-1: Bell #6 230/115 kV + T-1: Boulder #1 230/115 kV		101.2 %		
T-1: Bell #6 230/115 kV + T-1: Boulder Park #1 115/13.8 kV			103.7 %	117.1 %
T-1: Bell #6 230/115 kV + T-1: Cabinet Gorge (12) 230/13.8 kV			103.9 %	117.2 %
T-1: Bell #6 230/115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV			103.9 %	117.2 %
T-1: Bell #6 230/115 kV + T-1: Nine Mile #2 115/13.8 kV			104.0 %	117.4 %
T-1: Bell #6 230/115 kV + T-1: Noxon #1 230/13.8 kV			104.5 %	117.8 %
T-1: Bell #6 230/115 kV + T-1: Westside #2 230/115 kV	130.4 %	139.5 %	148.5 %	168.0 %
T-1: Boulder #1 230/115 kV + T-1: Westside #2 230/115 kV	113.6 %	123.1 %		
T-1: Boulder #2 230/115 kV + T-1: Westside #2 230/115 kV	111.8 %	121.3 %		
T-1: Boulder Park #1 115/13.8 kV + T-1: Cabinet Gorge (12) 230/13.8 kV				101.3 %
T-1: Boulder Park #1 115/13.8 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				101.3 %
T-1: Boulder Park #1 115/13.8 kV + T-1: Nine Mile #2 115/13.8 kV				101.5 %
T-1: Boulder Park #1 115/13.8 kV + T-1: Noxon #1 230/13.8 kV				101.9 %
T-1: Boulder Park #1 115/13.8 kV + T-1: Westside #2 230/115 kV			127.2 %	143.8 %
T-1: Cabinet Gorge (12) 230/13.8 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				100.4 %
T-1: Cabinet Gorge (12) 230/13.8 kV + T-1: Nine Mile #1 115/2				100.3 %
T-1: Cabinet Gorge (12) 230/13.8 kV + T-1: Nine Mile #2 115/13.8 kV				101.8 %
T-1: Cabinet Gorge (12) 230/13.8 kV + T-1: Upriver 13.8/2.4 kV				100.4 %

Row Labels	16HS	20HS	25HS	35HS
T-1: Cabinet Gorge (12) 230/13.8 kV + T-1: Upriver 13.8/4.2 kV				100.6 %
T-1: Cabinet Gorge (12) 230/13.8 kV + T-1: Westside #2 230/115 kV	109.9 %	119.4 %	127.6 %	144.1 %
T-1: Cabinet Gorge (34) 230/13.8 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				100.4 %
T-1: Cabinet Gorge (34) 230/13.8 kV + T-1: Nine Mile #1 115/2				100.3 %
T-1: Cabinet Gorge (34) 230/13.8 kV + T-1: Nine Mile #2 115/13.8 kV				101.8 %
T-1: Cabinet Gorge (34) 230/13.8 kV + T-1: Upriver 13.8/2.4 kV				100.4 %
T-1: Cabinet Gorge (34) 230/13.8 kV + T-1: Upriver 13.8/4.2 kV				100.6 %
T-1: Cabinet Gorge (34) 230/13.8 kV + T-1: Westside #2 230/115 kV	109.9 %	119.4 %	127.6 %	144.1 %
T-1: Hatwai 500/230 kV + N-1: Addy - Bell 115 kV				102.1 %
T-1: Hatwai 500/230 kV + N-1: Addy - Bell 115 kV (MLN)				104.1 %
T-1: Hatwai 500/230 kV + N-1: Airway Heights - Devils Gap 115 kV				101.7 %
T-1: Hatwai 500/230 kV + N-1: Airway Heights - Silver Lake 115 kV				101.8 %
T-1: Hatwai 500/230 kV + N-1: Airway Heights - Sunset 115 kV				104.9 %
T-1: Hatwai 500/230 kV + N-1: Beacon - Bell #1 115 kV				105.9 %
T-1: Hatwai 500/230 kV + N-1: Beacon - Boulder #1 115 kV				103.9 %
T-1: Hatwai 500/230 kV + N-1: Beacon - Francis & Cedar 115 kV				107.0 %
T-1: Hatwai 500/230 kV + N-1: Beacon - Ninth & Central #1 115 kV				107.5 %
T-1: Hatwai 500/230 kV + N-1: Beacon - Ninth & Central #2 115 kV				107.5 %
T-1: Hatwai 500/230 kV + N-1: Beacon - Northeast 115 kV				105.6 %
T-1: Hatwai 500/230 kV + N-1: Beacon - Ross Park 115 kV			106.7 %	120.4 %
T-1: Hatwai 500/230 kV + N-1: Bell - Creston 115 kV				105.7 %
T-1: Hatwai 500/230 kV + N-1: Bell - Northeast 115 kV				111.5 %
T-1: Hatwai 500/230 kV + N-1: Boulder - Otis Orchards #1 115 kV				104.3 %
T-1: Hatwai 500/230 kV + N-1: Boulder - Otis Orchards #2 115 kV				105.3 %
T-1: Hatwai 500/230 kV + N-1: Boulder - Post Falls 115 kV				104.3 %
T-1: Hatwai 500/230 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				105.0 %
T-1: Hatwai 500/230 kV + N-1: Boulder #1 230/115 kV				107.3 %
T-1: Hatwai 500/230 kV + N-1: Boulder #2 230/115 kV				107.2 %
T-1: Hatwai 500/230 kV + N-1: College & Walnut - Post Street 115 kV				103.9 %
T-1: Hatwai 500/230 kV + N-1: Devils Gap - Nine Mile 115 kV				109.8 %
T-1: Hatwai 500/230 kV + N-1: Metro - Post Street 115 kV				106.5 %
T-1: Hatwai 500/230 kV + N-1: Metro - Sunset 115 kV				105.9 %
T-1: Hatwai 500/230 kV + N-1: Nine Mile - Westside 115 kV				107.3 %
T-1: Hatwai 500/230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				106.7 %
T-1: Hatwai 500/230 kV + N-1: Otis Orchards - Post Falls 115 kV				104.1 %
T-1: Hatwai 500/230 kV + N-1: Post Street - Third & Hatch 115 kV				111.0 %
T-1: Hatwai 500/230 kV + N-1: Ross Park - Third & Hatch 115 kV				108.6 %
T-1: Hatwai 500/230 kV + N-1: Shawnee - Sunset 115 kV (SUN-FRL)				102.2 %
T-1: Hatwai 500/230 kV + N-1: Trentwood - Vera Tap 115 kV				102.4 %
T-1: Hatwai 500/230 kV + S-1: Airway Heights 115kV Switched Shunt				105.1 %
T-1: Hatwai 500/230 kV + S-1: Colbert 115kV Switched Shunt				105.1 %
T-1: Hatwai 500/230 kV + S-1: Deer Park 115kV Switched Shunt				104.9 %
T-1: Hatwai 500/230 kV + S-1: Otis Orchards 115kV Switched Shunt				105.4 %
T-1: Hatwai 500/230 kV + S-1: Spokane Ind Park 115kV Switched Shunt				105.0 %
T-1: Hatwai 500/230 kV + S-1: Sunset 115kV Switched Shunt				105.3 %
T-1: Hatwai 500/230 kV + S-1: Third & Hatch 115kV Switched Shunt				106.1 %
T-1: Hatwai 500/230 kV + S-1: Trentwood 115kV Switched Shunt				105.5 %
T-1: Hatwai 500/230 kV + T-1: Beacon #1 230/115 kV		101.3 %	107.7 %	120.6 %
T-1: Hatwai 500/230 kV + T-1: Beacon #2 230/115 kV		101.1 %	107.6 %	120.5 %
T-1: Hatwai 500/230 kV + T-1: Bell #6 230/115 kV		102.6 %	109.0 %	122.8 %
T-1: Hatwai 500/230 kV + T-1: Boulder Park #1 115/13.8 kV				106.0 %
T-1: Hatwai 500/230 kV + T-1: Nine Mile #1 115/2				104.9 %
T-1: Hatwai 500/230 kV + T-1: Nine Mile #2 115/13.8 kV				106.4 %
T-1: Hatwai 500/230 kV + T-1: Upriver 13.8/2.4 kV				105.0 %
T-1: Hatwai 500/230 kV + T-1: Upriver 13.8/4.2 kV				105.2 %
T-1: Hatwai 500/230 kV + T-1: Westside #2 230/115 kV	115.9 %	125.5 %	133.8 %	150.8 %
T-1: Nine Mile #1 115/2 + T-1: Noxon #1 230/13.8 kV				100.8 %
T-1: Nine Mile #2 115/13.8 kV + T-1: Noxon #1 230/13.8 kV				102.3 %
T-1: Nine Mile #2 115/13.8 kV + T-1: Westside #2 230/115 kV	110.1 %	119.7 %	127.9 %	144.4 %
T-1: Noxon #1 230/13.8 kV + N-1: Boulder - Post Falls 115 kV				100.2 %
T-1: Noxon #1 230/13.8 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				101.0 %
T-1: Noxon #1 230/13.8 kV + T-1: Upriver 13.8/2.4 kV				101.0 %
T-1: Noxon #1 230/13.8 kV + T-1: Upriver 13.8/4.2 kV				101.2 %
T-1: Noxon #1 230/13.8 kV + T-1: Westside #2 230/115 kV	110.8 %	120.3 %	128.4 %	144.9 %
T-1: Noxon #2 230/13.8 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				100.1 %
T-1: Noxon #2 230/13.8 kV + T-1: Upriver 13.8/2.4 kV				100.1 %
T-1: Noxon #2 230/13.8 kV + T-1: Upriver 13.8/4.2 kV				100.3 %

Row Labels	16HS	20HS	25HS	35HS
T-1: Noxon #2 230/13.8 kV + T-1: Westside #2 230/115 kV	109.5 %	119.0 %	127.1 %	
WEST (48463) -> WEST (48461) CKT 2				
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Westside #1 230/115 kV		101.8 %	108.7 %	122.5 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Bell #5 230 kV				106.2 %
N-1: Beacon - Bell #4 230 kV + T-1: Westside #1 230/115 kV		101.0 %	108.0 %	122.2 %
N-1: Beacon - Bell #5 230 kV + T-1: Westside #1 230/115 kV		101.3 %	108.3 %	122.5 %
N-1: Beacon - Boulder 230 kV + T-1: Westside #1 230/115 kV			102.2 %	115.7 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Westside #1 230/115 kV			104.6 %	118.4 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Westside #1 230/115 kV			104.1 %	117.8 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Westside #1 230/115 kV			104.1 %	117.8 %
N-1: Beacon - Ross Park 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				101.8 %
N-1: Beacon - Ross Park 115 kV + T-1: Westside #1 230/115 kV	104.0 %	113.1 %	121.0 %	137.1 %
N-1: Bell - Northeast 115 kV + T-1: Westside #1 230/115 kV		100.7 %	107.7 %	122.1 %
N-1: Benewah - Pine Creek 230 kV + T-1: Westside #1 230/115 kV			103.0 %	116.3 %
N-1: Boulder - Lancaster 230 kV + T-1: Westside #1 230/115 kV		101.2 %	107.9 %	121.3 %
N-1: Boulder #1 230/115 kV + T-1: Westside #1 230/115 kV			104.4 %	118.0 %
N-1: Boulder #2 230/115 kV + T-1: Westside #1 230/115 kV			104.4 %	117.9 %
N-1: Cabinet - Rathdrum 230 kV + T-1: Westside #1 230/115 kV			103.1 %	116.5 %
N-1: College & Walnut - Post Street 115 kV + T-1: Westside #1 230/115 kV			102.8 %	116.4 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Westside #1 230/115 kV		101.4 %	107.9 %	120.9 %
N-1: Lancaster - Noxon 230 kV + T-1: Westside #1 230/115 kV			102.5 %	115.8 %
N-1: Metro - Post Street 115 kV + T-1: Westside #1 230/115 kV			102.9 %	116.6 %
N-1: Metro - Sunset 115 kV + T-1: Westside #1 230/115 kV			102.3 %	115.9 %
N-1: Nine Mile - Westside 115 kV + T-1: Westside #1 230/115 kV			105.4 %	118.1 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Westside #1 230/115 kV			103.8 %	117.6 %
N-1: Noxon - Pine Creek 230 kV + T-1: Westside #1 230/115 kV			102.4 %	115.7 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Westside #1 230/115 kV		102.4 %	109.9 %	125.1 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Westside #1 230/115 kV			105.4 %	119.4 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Westside #1 230/115 kV			102.6 %	116.0 %
T-1: Beacon #1 230/115 kV + T-1: Beacon #2 230/115 kV			105.3 %	117.2 %
T-1: Beacon #1 230/115 kV + T-1: Bell #6 230/115 kV				109.5 %
T-1: Beacon #1 230/115 kV + T-1: Westside #1 230/115 kV	102.7 %	111.9 %	119.3 %	134.1 %
T-1: Beacon #2 230/115 kV + T-1: Bell #6 230/115 kV				109.4 %
T-1: Beacon #2 230/115 kV + T-1: Westside #1 230/115 kV	102.5 %	111.7 %	119.1 %	133.9 %
T-1: Bell #6 230/115 kV + T-1: Westside #1 230/115 kV	105.2 %	112.4 %	119.7 %	135.4 %
T-1: Boulder Park #1 115/13.8 kV + T-1: Westside #1 230/115 kV			102.4 %	115.7 %
T-1: Cabinet Gorge (12) 230/13.8 kV + T-1: Westside #1 230/115 kV			102.7 %	116.0 %
T-1: Cabinet Gorge (34) 230/13.8 kV + T-1: Westside #1 230/115 kV			102.7 %	116.0 %
T-1: Hatwai 500/230 kV + T-1: Westside #1 230/115 kV		101.0 %	107.7 %	121.4 %
T-1: Nine Mile #2 115/13.8 kV + T-1: Westside #1 230/115 kV			102.9 %	116.2 %
T-1: Noxon #1 230/13.8 kV + T-1: Westside #1 230/115 kV			103.3 %	116.6 %
T-1: Noxon #2 230/13.8 kV + T-1: Westside #1 230/115 kV			102.3 %	
P7				
WEST (48463) -> WEST (48461) CKT 1				
N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV				107.8 %
N-2 (STR): Bell - Boundary #3 230 kV & Addy - Bell 115 kV				101.3 %
N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV				104.9 %
N-2 (STR): Boulder - Otis Orchards #1 115 kV & Boulder - Otis Orchards #2 115 kV				101.3 %
SSEE				
WEST (48463) -> WEST (48461) CKT 1				
GEN: Boulder Park Thermal - All Units				100.1 %
GEN: Nine Mile Hydro - All Units				100.5 %
GEN: Post & Monroe Street Hydro - All Units				102.0 %
GEN: Spokane Waste to Energy Thermal				102.2 %
N-2 (ROW and ADJ): Airway Heights - Devils Gap 115 kV and Devils Gap - Nine Mile 115 kV			103.9 %	115.1 %
N-2 (ROW and ADJ): Beacon - Bell #4 230 kV and Beacon - Bell #1 115 kV				106.3 %
N-2 (ROW and ADJ): Beacon - Francis & Cedar 115 kV and Bell - Northeast 115 kV				102.0 %
N-2 (ROW and ADJ): Devils Gap - Ninemile 115 kV and Ninemile - Westside 115 kV				102.1 %
N-2 (ROW): Beacon - Bell #4 230 kV and Beacon - Bell #1 115 kV and Beacon - Northeast 115 kV and Beacon - Francis & Cedar 115 kV			109.8 %	
N-2 (ROW): Beacon - Bell #4 230kV and Beacon - Boulder 230kV and Beacon - Rathdrum 230kV and Beacon - Boulder #1 115kV			105.6 %	
N-2 (ROW): Beacon - Bell #5 230 kV and Beacon - Francis & Cedar 115 kV and Beacon - Northeast 115 kV				108.0 %
N-2 (ROW): Bell - Taft 500 kV and Beacon - Rathdrum 230 kV and Lancaster - Rathdrum 230 kV and Lancaster - Noxon 230 kV				100.3 %

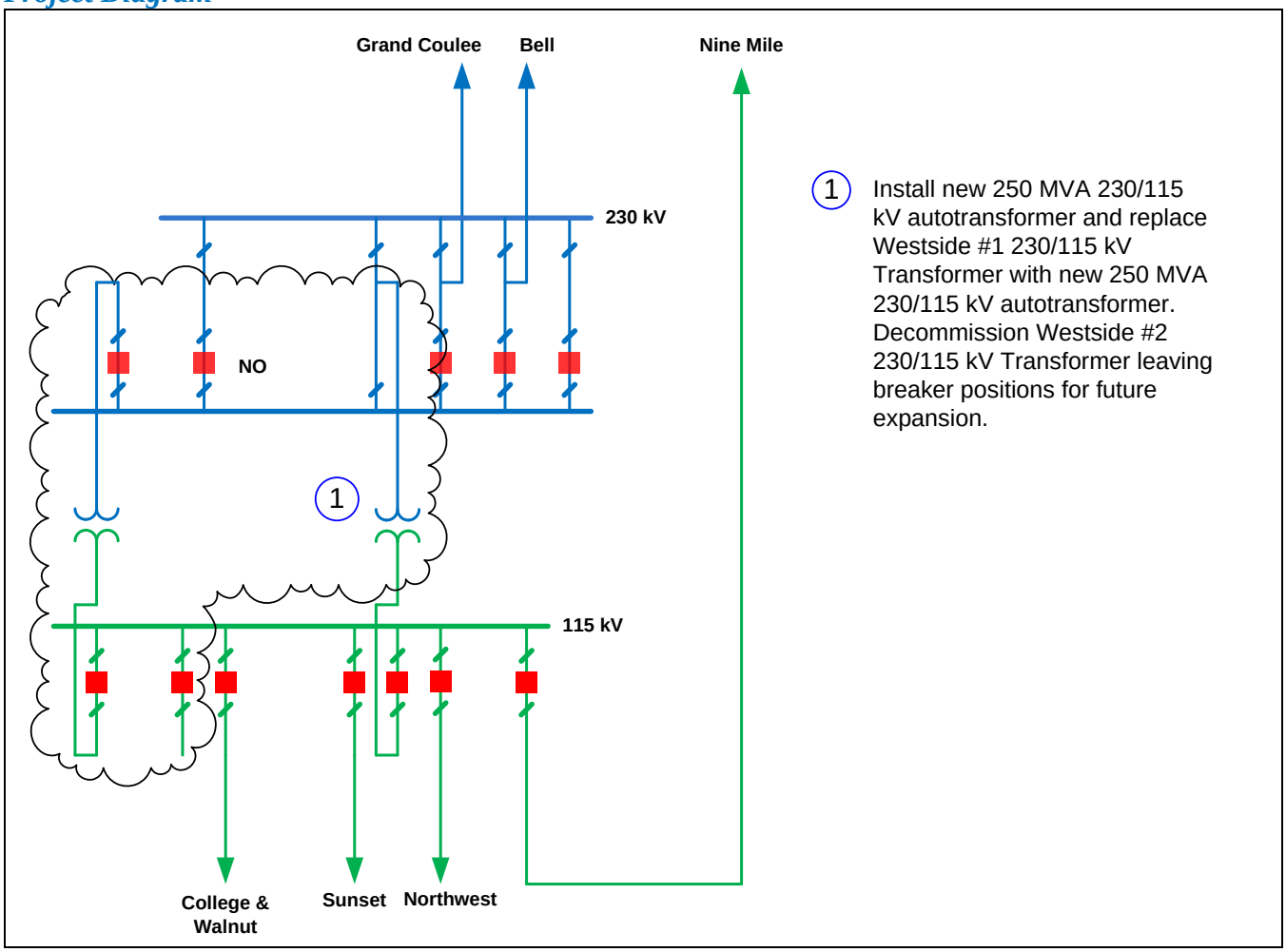
Row Labels	16HS	20HS	25HS	35HS
N-2 (ROW): Bell - Taft 500 kV and Bell - Lancaster 230 kV and Beacon - Rathdrum 230 kV and Boulder - Lancaster 230 kV				106.7 %
N-2 (ROW): Bell - Taft 500 kV and Cabinet - Rathdrum 230 kV and Lancaster - Noxon 230 kV				102.6 %
SUB: Bell 500, 230 & 115 (BPA)		103.9 %	113.0 %	132.7 %
WEST (48463) -> WEST (48461) CKT 2				
SUB: Bell 500, 230 & 115 (BPA)				102.7 %

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Westside Transformer Replacement

Project Diagram



Spokane Valley Transmission Reinforcement

Project Scope/Description

The Spokane Valley Transmission Reinforcement project consists of constructing a new Irvin Station with six 115 kV terminals, a new 115 kV transmission line from Irvin Station to the Inland Empire Paper facility, rebuild of Irvin – Opportunity 115 kV Transmission Line, upgrade of the Opportunity Station with the addition of 3 new 115 kV breakers, and reconductor the Beacon – Irvin section of Beacon – Boulder #2 115 kV Transmission Line. The Irvin Station will be constructed with a breaker and a half bus configuration, 33.5 MVAr switched capacitor bank, and provisions for distribution facilities. Reconstruction of the Millwood Station served from the Beacon – Boulder #2 115 kV Transmission Line was completed in 2013 with accommodations for providing backup service to the Inland Empire Paper facility once the new transmission line from Irvin Station is completed.

Timeline

The project is scheduled to be completed by the end of 2016.

Performance Criteria Violations

Previous planning assessments stated there were several single contingency outages causing thermal overloads and low voltages in the Spokane Valley area. Specific issues were the opening of one terminal on the Beacon – Boulder #2 or Ninth & Central – Otis Orchards 115 kV transmission lines. Increased load growth and increased demand requirements of Inland Empire Paper contributed towards the observed issues.

Heavy Summer Assessment Results

Row Labels	16HS	20HS	25HS	35HS
P2				
BF: A600 Beacon North & South 115 kV				
OTIS (48311) -> LIBTYLK (48185) CKT 1	129.2 %	134.5 %	143.5 %	163.8 %
BF: A604 Beacon North 115 kV, Beacon-Boulder #1				
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2	101.3 %	106.8 %	114.3 %	131.6 %
BF: A612 Beacon South 115 kV, Beacon-Boulder #2				
BEACON N (48025) -> BEACON N (48023) CKT 1				100.9 %
BF: A642 Otis Orchards 115 kV, Otis Orchards-Post Falls				
NINTHCNT_S (48272) -> NELSONT (48005) CKT 1				100.5 %
BF: A645 Otis Orchards 115 kV, Boulder-Otis Orchards				
NINTHCNT_S (48272) -> NELSONT (48005) CKT 1				100.5 %
BF: A717 Boulder East & West 115 kV				
CHESTER (48069) -> OPPORTUN (48299) CKT 1	100.9 %	103.9 %	109.2 %	120.6 %
NELSONT (48005) -> CHESTER (48069) CKT 1	122.2 %	126.0 %	132.5 %	146.5 %
NINTHCNT_S (48272) -> NELSONT (48005) CKT 1	133.3 %	137.4 %	144.2 %	158.9 %
BUS: Otis Orchards 115 kV				
NINTHCNT_S (48272) -> NELSONT (48005) CKT 1				100.6 %
N-1: Ninth & Central - Otis Orchards 115 kV Open @ OTI				
NINTHCNT_S (48272) -> NELSONT (48005) CKT 1				100.1 %

Heavy Winter Assessment Results

Row Labels	16HW	20HW	25HW	35HW
P2				
BF: A600 Beacon North & South 115 kV				
OTIS (48311) -> LIBTYLK (48185) CKT 1			105.3 %	110.8 %
BF: A604 Beacon North 115 kV, Beacon-Boulder #1				
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2			105.6 %	116.3 %
BF: A717 Boulder East & West 115 kV				
NELSONT (48005) -> CHESTER (48069) CKT 1				102.0 %
NINTHCNT_S (48272) -> NELSONT (48005) CKT 1	100.1 %	100.4 %	104.3 %	111.9 %

Heavy Summer Low Hydro Assessment Results

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
P2				
BF: A600 Beacon North & South 115 kV				
OTIS (48311) -> LIBTYLK (48185) CKT 1	140.2 %	150.9 %	161.2 %	176.4 %
BF: A604 Beacon North 115 kV, Beacon-Boulder #1				
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2	117.4 %	125.1 %	133.0 %	147.0 %
BEACON S (48031) -> BEACON S (48029) CKT 1			100.8 %	105.3 %
BF: A612 Beacon South 115 kV, Beacon-Boulder #2				
BEACON N (48025) -> BEACON N (48023) CKT 1			102.2 %	107.3 %
BF: A642 Otis Orchards 115 kV, Otis Orchards-Post Falls				
NINTHCNT_S (48272) -> NELSONT (48005) CKT 1				100.2 %
BF: A645 Otis Orchards 115 kV, Boulder-Otis Orchards				
NINTHCNT_S (48272) -> NELSONT (48005) CKT 1				100.2 %
BF: A717 Boulder East & West 115 kV				
BEACON N (48023) -> NINTHCNT_S (48272) CKT 1				104.9 %
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2				104.1 %
CHESTER (48069) -> OPPORTUN (48299) CKT 1	104.5 %	108.0 %	113.5 %	124.4 %

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
NELSONT (48005) -> CHESTER (48069) CKT 1	125.6 %	130.1 %	136.9 %	150.3 %
NINTHCNT_S (48272) -> NELSONT (48005) CKT 1	136.8 %	141.5 %	148.6 %	162.6 %
BUS: Ninth & Central North 115 kV				
ROSSPARK (48371) -> THIRHACH (48431) CKT 1				115.8 %
BUS: Ninth & Central South 115 kV				
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			100.3 %	111.5 %
METRO (48225) -> SUNSET (48421) CKT 1				111.4 %
BUS: Otis Orchards 115 kV				
NINTHCNT_S (48272) -> NELSONT (48005) CKT 1				100.3 %
P6				
N-1: Bell - Westside 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				104.9 %
N-1: Bell - Westside 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				104.9 %
N-1: Bell - Westside 230 kV + N-1: Beacon - Boulder #2 115 kV				
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				106.1 %
N-1: Bell - Westside 230 kV + N-1: Bell - Northeast 115 kV				
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				105.4 %
N-1: Bell - Westside 230 kV + N-1: Benewah - Boulder 230 kV				
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				105.0 %
N-1: Bell - Westside 230 kV + N-1: Dworshak - Hatwai 500 kV				
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				107.5 %
N-1: Bell - Westside 230 kV + N-1: Ninth & Central - Otis Orchards 115 kV				
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				105.8 %
N-1: Bell - Westside 230 kV + N-1: Trentwood - Vera Tap 115 kV				
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				104.7 %
N-1: Bell - Westside 230 kV + S-1: Airway Heights 115kV Switched Shunt				
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				107.7 %
N-1: Bell - Westside 230 kV + T-1: Nine Mile #2 115/13.8 kV				
THIRHACH (48431) -> POSTSTRT (48339) CKT 1				105.3 %

Light Scenario Assessment Results

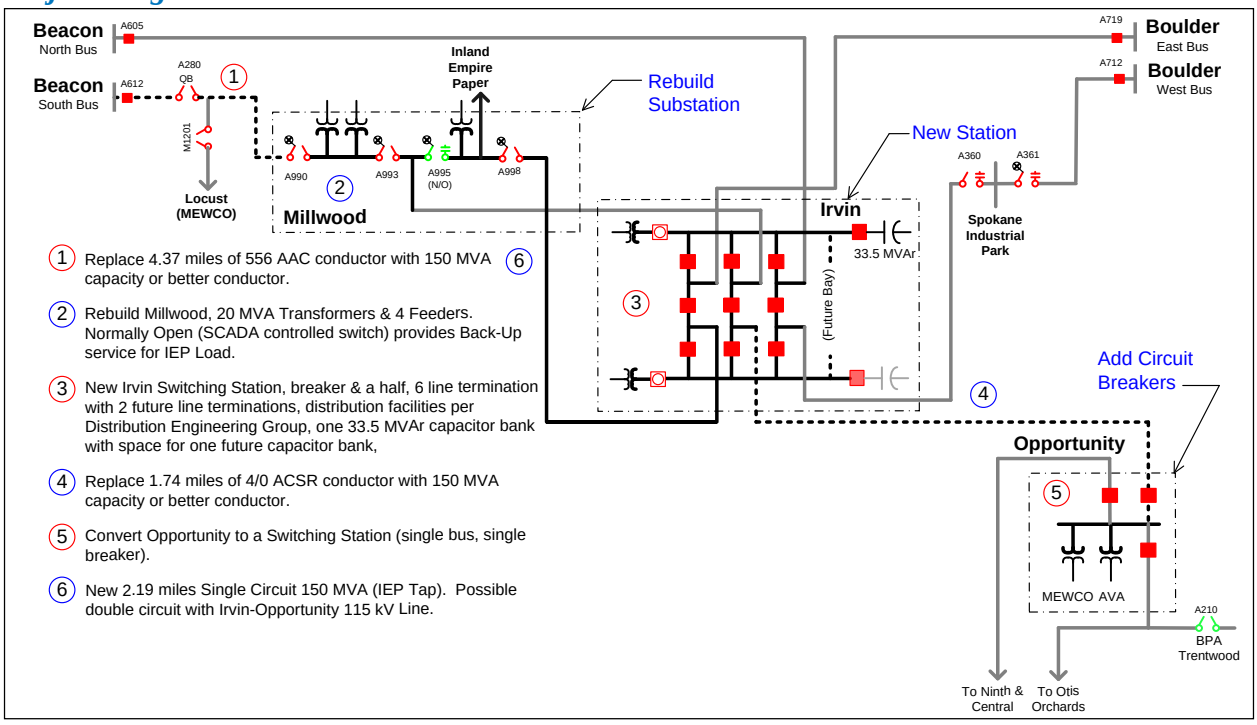
No potential violations identified

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- The Irvin Project – Final
- SP-2009-03 – Summary – Irvin (Spokane Valley Transmission Reinforcement) Project
- Irvin Substation Project

Project Diagram



Ninth & Central – Sunset 115 kV Transmission Line Rebuild

Performance Criteria Violations

During N-1-1 outages, the Ninth & Central – Sunset 115 kV Transmission Line exceeds its applicable facility rating. The existing Ninth & Central – Sunset 115 kV Transmission Line is constructed of 795 kcmil and 250 CU conductor. The 250 CU will be replaced with 795 AAC conductor with a minimum thermal capacity rating of 150 MVA at 40C.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 Heavy Scenarios.

The project is scheduled to be completed by the end of 2016.

Sensitivity to load forecast and operating condition of the Waste to Energy plant impact the timeline.

Performance Criteria Violations

Heavy Summer Assessment Results

Row Labels	16HS	20HS	25HS	35HS
NA				
RES: N-2 (ROW and ADJ): Airway Heights - Devils Gap 115 kV and Devils Gap - Nine Mile 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				102.2 %
RES: N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.8 %
P1				
N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				109.4 %
N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				108.9 %
P2				
BF: A413 Westside 115 kV, Ninemile-Westside				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				117.0 %
BF: A470 Westside 115 kV, College & Walnut-Westside				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				116.2 %
BF: A688 Ninth & Central North & South 115 kV				
SUNSET (48421) -> SOUTHEAS (48395) CKT 1			101.8 %	112.0 %
BF: A689 Ninth & Central South 115 kV, Ninth & Central-Otis Orchards				
SUNSET (48421) -> SOUTHEAS (48395) CKT 1			101.1 %	111.1 %
BUS: Ninth & Central South 115 kV				
SUNSET (48421) -> SOUTHEAS (48395) CKT 1			101.6 %	111.7 %
BUS: Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				113.7 %
BUS: Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.5 %
BUS: Westside 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.6 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			102.9 %	120.6 %
BUS: Westside 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				114.1 %
N-1: Ninth & Central - Sunset 115 kV Open @ 9CE				
SUNSET (48421) -> SOUTHEAS (48395) CKT 1			101.7 %	111.8 %
N-1: Sunset - Westside 115 kV Open @ WES				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.2 %
P3				
G-1: Nine Mile Hydro Units 1-4 + N-1: Beacon - Ross Park 115 kV				

Row Labels	16HS	20HS	25HS	35HS
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.7 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.5 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.4 %
P6				
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.2 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			100.2 %	117.3 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Metro - Sunset 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.6 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				116.1 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				113.5 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			103.9 %	119.7 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	106.8 %	114.1 %	122.0 %	139.7 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				109.4 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1				104.3 %
WEST (48461) -> SPKWASTE (48409) CKT 1			105.4 %	118.9 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				107.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		103.4 %	110.6 %	126.9 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				101.3 %
WEST (48461) -> SPKWASTE (48409) CKT 1				110.5 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.5 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				108.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		103.2 %	111.0 %	128.6 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				102.8 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				102.0 %
N-1: Airway Heights - Devils Gap 115 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.1 %
N-1: Airway Heights - Sunset 115 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.5 %
N-1: Airway Heights - Sunset 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				112.4 %
N-1: Airway Heights - Sunset 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.6 %
N-1: Beacon - Boulder #1 115 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.2 %
N-1: Beacon - Boulder #2 115 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				102.9 %
N-1: Beacon - Boulder #2 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				112.5 %
N-1: Beacon - Boulder #2 115 kV + N-1: Metro - Sunset 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.8 %
N-1: Beacon - Boulder #2 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				113.5 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				108.6 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.6 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				112.7 %
N-1: Beacon - Ross Park 115 kV + N-1: Bell - Northeast 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.9 %
N-1: Beacon - Ross Park 115 kV + N-1: Boulder - Post Falls 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.0 %
N-1: Beacon - Ross Park 115 kV + N-1: College & Walnut - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.3 %
N-1: Beacon - Ross Park 115 kV + N-1: College & Walnut - Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.5 %

Row Labels	16HS	20HS	25HS	35HS
N-1: Beacon - Ross Park 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				117.7 %
N-1: Beacon - Ross Park 115 kV + N-1: Metro - Sunset 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.3 %
N-1: Beacon - Ross Park 115 kV + N-1: Ninth & Central - Otis Orchards 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.6 %
N-1: Beacon - Ross Park 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		101.2 %	109.6 %	128.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	111.3 %	118.3 %	127.7 %	148.7 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				114.9 %
N-1: Beacon - Ross Park 115 kV + N-1: Otis Orchards - Post Falls 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.2 %
N-1: Beacon - Ross Park 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				114.8 %
N-1: Beacon - Ross Park 115 kV + N-1: Trentwood - Vera Tap 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.7 %
N-1: Beacon - Ross Park 115 kV + S-1: Airway Heights 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				102.1 %
N-1: Beacon - Ross Park 115 kV + S-1: Sunset 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.5 %
N-1: Beacon - Ross Park 115 kV + S-1: Third & Hatch 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				102.9 %
N-1: Beacon - Ross Park 115 kV + T-1: Benewah 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.1 %
N-1: Beacon - Ross Park 115 kV + T-1: Nine Mile #2 115/13.8 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.7 %
N-1: Beacon - Ross Park 115 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				115.9 %
N-1: Beacon - Ross Park 115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				113.9 %
N-1: Bell - Westside 230 kV + N-1: Airway Heights - Devils Gap 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.8 %
N-1: Bell - Westside 230 kV + N-1: Beacon - Ross Park 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				105.1 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.1 %	108.6 %	125.3 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				100.7 %
N-1: Bell - Westside 230 kV + N-1: Coulee - Westside 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				114.1 %
N-1: Bell - Westside 230 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				107.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		100.5 %	108.7 %	127.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				101.7 %
N-1: Bell - Westside 230 kV + N-1: Metro - Sunset 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				115.2 %
N-1: Bell - Westside 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.6 %
N-1: Bell - Westside 230 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			100.4 %	118.7 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	100.6 %	110.1 %	119.0 %	139.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				109.3 %
N-1: Bell - Westside 230 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.9 %
N-1: Benewah - Boulder 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.4 %
N-1: Benewah - Boulder 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.1 %
N-1: Benewah - Boulder 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.4 %
N-1: Benewah - Moscow 230 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.0 %
N-1: Benewah - Moscow 230 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.7 %
N-1: Benewah - Moscow 230 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.7 %
N-1: Benewah - Thornton 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.5 %
N-1: College & Walnut - Post Street 115 kV + N-1: Metro - Post Street 115 kV				

Row Labels	16HS	20HS	25HS	35HS
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				113.4 %
N-1: College & Walnut - Post Street 115 kV + N-1: Metro - Sunset 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.2 %
N-1: College & Walnut - Post Street 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				118.0 %
N-1: College & Walnut - Westside 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				111.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		103.1 %	112.0 %	132.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.0 %
WEST (48461) -> SPKWASTE (48409) CKT 1				110.0 %
N-1: Columbia Falls - Flathead 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.1 %
N-1: Conkelley - Libby 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.2 %
N-1: Coulee - Westside 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.6 %
N-1: Coulee - Westside 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				112.8 %
N-1: Coulee - Westside 230 kV + N-1: Metro - Sunset 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.1 %
N-1: Coulee - Westside 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				114.0 %
N-1: Dry Creek - Talbot 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.0 %
N-1: Dworshak - Taft 500 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.1 %
N-1: Flathead - Hot Springs 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.0 %
N-1: Francis & Cedar - Ross Park 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				112.2 %
N-1: Hatwai - Lower Granite 500 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.8 %
N-1: Hatwai - Lower Granite 500 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.5 %
N-1: Hatwai - Lower Granite 500 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.7 %
N-1: Hot Springs - Noxon #1 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.2 %
N-1: Hot Springs - Noxon #2 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.1 %
N-1: Hot Springs - Taft 500 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.3 %
N-1: Lolo - Oxbow 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.2 %
N-1: Metro - Post Street 115 kV + N-1: Ninth & Central - Otis Orchards 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				113.9 %
N-1: Metro - Post Street 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.4 %
N-1: Metro - Post Street 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				114.9 %
N-1: Metro - Post Street 115 kV + N-1: Sunset - Westside 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			100.4 %	115.9 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	104.8 %	109.9 %	118.0 %	135.4 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				106.3 %
N-1: Metro - Post Street 115 kV + S-1: Airway Heights 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				113.3 %
N-1: Metro - Post Street 115 kV + S-1: Sunset 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				115.9 %
N-1: Metro - Post Street 115 kV + T-1: Nine Mile #2 115/13.8 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.5 %
N-1: Metro - Post Street 115 kV + T-1: Westside #1 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				101.7 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			103.6 %	121.8 %
N-1: Metro - Post Street 115 kV + T-1: Westside #2 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			102.3 %	120.3 %
N-1: Metro - Sunset 115 kV + N-1: Ninth & Central - Otis Orchards 115 kV				

Row Labels	16HS	20HS	25HS	35HS
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				102.2 %
N-1: Metro - Sunset 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.8 %
N-1: Metro - Sunset 115 kV + N-1: Sunset - Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			101.2 %	116.6 %
N-1: Metro - Sunset 115 kV + S-1: Airway Heights 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.2 %
N-1: Metro - Sunset 115 kV + S-1: Sunset 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.6 %
N-1: Metro - Sunset 115 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.1 %
N-1: Metro - Sunset 115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				108.6 %
N-1: Ninth & Central - Otis Orchards 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				115.8 %
N-1: Ninth & Central - Third & Hatch 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				108.9 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.7 %	109.9 %	128.3 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				101.8 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.1 %
N-1: North Lewiston - Shawnee 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.1 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Trentwood - Vera Tap 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.6 %
N-1: Post Street - Third & Hatch 115 kV + S-1: Airway Heights 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				113.1 %
N-1: Post Street - Third & Hatch 115 kV + S-1: Sunset 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				115.7 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Nine Mile #2 115/13.8 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.4 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Westside #1 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				108.4 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		100.7 %	109.4 %	128.8 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				102.9 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Westside #2 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				106.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			107.2 %	126.3 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				101.4 %
N-1: Shawnee - Thornton 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.8 %
N-1: Shawnee - Thornton 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.5 %
N-1: Shawnee - Thornton 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.4 %
N-1: Talbot - Walla Walla 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.0 %
S-1: Bell 230kV Switched Shunt + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.3 %
T-1: Hot Springs 500/230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.3 %
T-1: Westside #1 230/115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				114.1 %
P7				
N-2 (STR): Bell - Westside 230 kV & Coulee - Westside 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				114.1 %
SSEE				
N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				109.5 %

Heavy Winter Assessment Results

Row Labels	25HW	35HW
P2		

Row Labels	25HW	35HW
BF: A413 Westside 115 kV, Ninemile-Westside		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		102.6 %
BF: A470 Westside 115 kV, College & Walnut-Westside		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.1 %
P6		
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Metro - Post Street 115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.6 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Metro - Post Street 115 kV		
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		100.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	101.0 %	112.5 %
WEST (48461) -> SPKWASTE (48409) CKT 1		111.0 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Metro - Sunset 115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		105.0 %
WEST (48461) -> SPKWASTE (48409) CKT 1		105.1 %
N-1: Beacon - Ross Park 115 kV + N-1: Metro - Post Street 115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.1 %
N-1: Beacon - Ross Park 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV		
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		105.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	105.7 %	117.7 %
N-1: Bell - Westside 230 kV + N-1: Beacon - Ross Park 115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		102.4 %
N-1: Bell - Westside 230 kV + N-1: Metro - Post Street 115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		111.3 %
N-1: Bell - Westside 230 kV + N-1: Metro - Sunset 115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		104.1 %
N-1: Bell - Westside 230 kV + N-1: Post Street - Third & Hatch 115 kV		
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		105.4 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	102.7 %	117.4 %
N-1: College & Walnut - Westside 115 kV + N-1: Post Street - Third & Hatch 115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		109.3 %
WEST (48461) -> SPKWASTE (48409) CKT 1		107.7 %
N-1: Metro - Post Street 115 kV + N-1: Sunset - Westside 115 kV		
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		103.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	102.8 %	114.8 %
N-1: Metro - Post Street 115 kV + T-1: Westside #1 230/115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		105.5 %
N-1: Metro - Post Street 115 kV + T-1: Westside #2 230/115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		104.4 %
N-1: Metro - Sunset 115 kV + N-1: Sunset - Westside 115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		103.5 %
N-1: Ninth & Central - Third & Hatch 115 kV + N-1: Ross Park - Third & Hatch 115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		106.2 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Westside #1 230/115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		106.4 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Westside #2 230/115 kV		
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		104.6 %

Heavy Summer Low Hydro Assessment Results

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
NA				
RES: N-2 (ROW and ADJ): Airway Heights - Devils Gap 115 kV and Devils Gap - Nine Mile 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.9 %
RES: N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			104.8 %	118.4 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	108.9 %	115.4 %	122.9 %	138.3 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				108.4 %
P1				
N-1: Beacon - Ninth & Central #1 115 kV				
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2				104.2 %
ROSSPARK (48371) -> THIRHACH (48431) CKT 1				103.5 %
N-1: Beacon - Ninth & Central #2 115 kV				
BEACON N (48023) -> NINTHCNT_S (48272) CKT 1				102.3 %
ROSSPARK (48371) -> THIRHACH (48431) CKT 1				103.4 %
N-1: Beacon - Ross Park 115 kV				

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			104.0 %	115.3 %
N-1: Bell - Westside 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				108.8 %
N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		107.9 %	115.7 %	130.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Sunset 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			105.2 %	118.7 %
N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.8 %
ROSSPARK (48371) -> THIRHACH (48431) CKT 1				109.5 %
N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			101.0 %	112.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	101.7 %	111.4 %	119.4 %	132.2 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				102.6 %
T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.4 %
T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.7 %
P2				
BF: A375 Bell S0 & S4 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				102.6 %
BF: A410 Westside 115 kV, Sunset-Westside				
BEACON N (48023) -> ROSSPARK (48371) CKT 1				106.2 %
BEACON N (48025) -> BEACON N (48023) CKT 1				102.0 %
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				103.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	100.4 %	103.8 %	109.8 %	122.6 %
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			104.1 %	114.3 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	108.1 %	111.9 %	118.8 %	133.4 %
BF: A413 Westside 115 kV, Ninemile-Westside				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		105.2 %	112.7 %	129.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	114.5 %	122.3 %	130.7 %	149.0 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1			101.7 %	115.2 %
BF: A470 Westside 115 kV, College & Walnut-Westside				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		105.1 %	112.5 %	128.9 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	114.3 %	122.2 %	130.5 %	148.8 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1			101.6 %	115.1 %
BF: A574 Ross Park 115 kV, Francis & Cedar-Ross Park				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.6 %
BF: A688 Ninth & Central North & South 115 kV				
SUNSET (48421) -> SOUTHEAS (48395) CKT 1			102.2 %	111.6 %
BF: A689 Ninth & Central South 115 kV, Ninth & Central-Otis Orchards				
SUNSET (48421) -> SOUTHEAS (48395) CKT 1			101.3 %	110.6 %
BF: AXXX Bell S0 & S1 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				108.5 %
BF: B1135 Addy 115 kV, Addy-Bell				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				102.7 %
BUS: Metro 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			105.1 %	118.6 %
BUS: Ninth & Central South 115 kV				
SUNSET (48421) -> SOUTHEAS (48395) CKT 1			101.9 %	111.3 %
BUS: Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			102.1 %	114.9 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	102.6 %	112.2 %	120.4 %	134.7 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				106.1 %
BUS: Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				109.6 %
BUS: Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			103.0 %	114.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	104.0 %	113.4 %	121.5 %	134.8 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				106.4 %
BUS: Westside 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1	101.6 %	108.9 %	116.5 %	133.4 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	118.1 %	126.0 %	134.6 %	153.5 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1			104.2 %	118.1 %

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
BUS: Westside 230 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			105.3 %	119.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	109.4 %	115.9 %	123.5 %	140.0 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				109.8 %
N-1: Airway Heights - Devils Gap 115 kV Open @ DGP				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.9 %
N-1: Ninth & Central - Sunset 115 kV Open @ 9CE				
SUNSET (48421) -> SOUTHEAS (48395) CKT 1			102.0 %	111.4 %
N-1: Sunset - Westside 115 kV Open @ WES				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			106.3 %	119.4 %
ROSSPARK (48371) -> THIRHACH (48431) CKT 1				102.9 %
P3				
G-1: Albeni Falls Units 1-3 + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
G-1: Boulder Park Thermal Units 1-6 + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.6 %
G-1: Hungry Horse Hydro Units 1-4 + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.0 %
G-1: Hungry Horse Hydro Units 1-4 + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.5 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			105.2 %	
G-1: Nine Mile Hydro Units 1-4 + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				111.6 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	100.2 %	109.1 %	117.0 %	
G-1: Nine Mile Hydro Units 1-4 + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.5 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			106.4 %	119.9 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.8 %
G-1: Nine Mile Hydro Units 1-4 + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			102.5 %	113.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	103.2 %	112.9 %	121.0 %	133.8 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				102.9 %
G-1: Noxon Rapids Hydro Units 1-5 + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.2 %
G-1: Post Falls Hydro Units 1-6 + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.2 %
G-1: Post Falls Hydro Units 1-6 + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
G-1: Upriver Hydro Units 1-5 + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Bell - Westside 230 kV + G-1: Nine Mile Hydro Units 1-4				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.0 %
P5				
PSF: Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.6 %
PSF: Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			102.1 %	113.9 %
P6				
N-1: 3TM Bell - Boundary #1 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.3 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Beacon - Ross Park 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				101.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		102.3 %	109.2 %	120.9 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Bell - Westside 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			101.9 %	115.0 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Coulee - Westside 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.5 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Devils Gap - Nine Mile 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.1 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			104.9 %	118.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	105.7 %	114.9 %	123.1 %	138.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				108.3 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Metro - Sunset 115 kV				

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				107.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		104.9 %	112.5 %	126.6 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				101.0 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Ninth & Central - Otis Orchards 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.2 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				109.1 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		100.4 %	107.9 %	119.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	108.0 %	118.1 %	126.5 %	139.8 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				109.5 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.7 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.0 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				109.1 %
N-1: 3TM Burke - Thompson Falls A 115 kV (BUR-TOM) + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: 3TM Burke - Thompson Falls A 115 kV (SALT-TAFA) + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Addy - Devils Gap 115 kV + N-1: Devils Gap - Nine Mile 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.0 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.4 %	108.0 %	119.2 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		101.9 %	109.0 %	122.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	109.8 %	118.9 %	126.9 %	141.8 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				110.3 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1				101.3 %
WEST (48461) -> SPKWASTE (48409) CKT 1			101.2 %	115.3 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				110.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		108.3 %	115.7 %	129.5 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				102.5 %
WEST (48461) -> SPKWASTE (48409) CKT 1				106.7 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.4 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			107.1 %	118.4 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	107.7 %	117.4 %	125.5 %	138.3 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				108.4 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.2 %
N-1: Airway Heights - Devils Gap 115 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				108.3 %
N-1: Airway Heights - Devils Gap 115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.7 %
N-1: Airway Heights - Silver Lake 115 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.8 %
N-1: Albeni Falls - Pine Street 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Appleway - Ramsey 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Appleway - Rathdrum 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Beacon - Bell #4 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.3 %
N-1: Beacon - Bell #5 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				101.0 %
N-1: Beacon - Bell #5 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.2 %
N-1: Beacon - Boulder #2 115 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		100.4 %	107.1 %	118.4 %
N-1: Beacon - Boulder #2 115 kV + N-1: Metro - Post Street 115 kV				

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			100.6 %	113.4 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	102.1 %	110.8 %	118.6 %	133.0 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.9 %
N-1: Beacon - Boulder #2 115 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				102.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.0 %	108.2 %	121.7 %
N-1: Beacon - Boulder #2 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.8 %
N-1: Beacon - Boulder #2 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			105.3 %	116.6 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	106.1 %	115.6 %	123.7 %	136.5 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				107.3 %
N-1: Beacon - Boulder #2 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.1 %
N-1: Beacon - Boulder #2 115 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.0 %
N-1: Beacon - Boulder #2 115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.4 %
N-1: Beacon - Boulder 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.9 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Beacon - Ross Park 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				105.6 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		106.1 %	113.3 %	125.3 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				100.3 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				112.9 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	101.0 %	110.1 %	118.1 %	132.6 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				101.7 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		100.2 %	107.5 %	121.2 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.2 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			105.0 %	116.4 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	105.0 %	115.1 %	123.5 %	136.4 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				107.3 %
N-1: Beacon - Francis & Cedar 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.7 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				109.2 %
N-1: Beacon - Francis & Cedar 115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.3 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				101.5 %
N-1: Beacon - Northeast 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.4 %
N-1: Beacon - Ross Park 115 kV + N-1: Bell - Northeast 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			105.9 %	117.3 %
N-1: Beacon - Ross Park 115 kV + N-1: College & Walnut - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				116.5 %
N-1: Beacon - Ross Park 115 kV + N-1: College & Walnut - Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				116.6 %
N-1: Beacon - Ross Park 115 kV + N-1: Devils Gap - Nine Mile 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				116.6 %
N-1: Beacon - Ross Park 115 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			106.2 %	119.9 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	106.7 %	116.1 %	124.4 %	139.7 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				109.2 %
N-1: Beacon - Ross Park 115 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				109.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		106.4 %	114.2 %	128.5 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				102.1 %
N-1: Beacon - Ross Park 115 kV + N-1: Ninth & Central - Otis Orchards 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		100.6 %	107.2 %	118.6 %
N-1: Beacon - Ross Park 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1	120.0 %	129.4 %	138.3 %	153.5 %

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	136.1 %	146.4 %	156.4 %	173.0 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1	102.9 %	110.3 %	117.5 %	129.5 %
N-1: Beacon - Ross Park 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			107.0 %	118.9 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	107.0 %	117.1 %	125.5 %	139.0 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				108.9 %
N-1: Beacon - Ross Park 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				115.1 %
N-1: Beacon - Ross Park 115 kV + S-1: Airway Heights 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			106.4 %	117.6 %
N-1: Beacon - Ross Park 115 kV + S-1: Sunset 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		100.7 %	107.6 %	118.6 %
N-1: Beacon - Ross Park 115 kV + S-1: Third & Hatch 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		100.8 %	107.6 %	119.0 %
N-1: Beacon - Ross Park 115 kV + T-1: Nine Mile #2 115/13.8 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			105.2 %	
N-1: Beacon - Ross Park 115 kV + T-1: Westside #1 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			104.4 %	117.1 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	107.3 %	114.9 %	122.6 %	137.0 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				107.7 %
N-1: Beacon - Ross Park 115 kV + T-1: Westside #2 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			102.1 %	114.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	105.2 %	112.8 %	120.3 %	134.2 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.9 %
N-1: Bell - Coulee #6 500 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.4 %
N-1: Bell - Creston 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.3 %
N-1: Bell - Northeast 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.9 %
N-1: Bell - Northeast 115 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.6 %
N-1: Bell - Northeast 115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.8 %
N-1: Bell - Westside 230 kV + N-1: 3TM Boundary - Box Canyon - Colville (BPA) 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.1 %
N-1: Bell - Westside 230 kV + N-1: 3TM Boundary - Box Canyon - Colville BPA 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.1 %
N-1: Bell - Westside 230 kV + N-1: Addy - Devils Gap 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			104.9 %	117.9 %
N-1: Bell - Westside 230 kV + N-1: Airway Heights - Devils Gap 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.4 %
N-1: Bell - Westside 230 kV + N-1: Beacon - Boulder #2 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.5 %
N-1: Bell - Westside 230 kV + N-1: Beacon - Francis & Cedar 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			100.6 %	113.7 %
N-1: Bell - Westside 230 kV + N-1: Beacon - Ross Park 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		103.9 %	111.2 %	126.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	113.4 %	121.4 %	129.6 %	146.6 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1			101.3 %	113.9 %
N-1: Bell - Westside 230 kV + N-1: Bell - Northeast 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.0 %
N-1: Bell - Westside 230 kV + N-1: Benewah - Boulder 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.2 %
N-1: Bell - Westside 230 kV + N-1: Coulee - Westside 230 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			105.3 %	119.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	109.4 %	115.9 %	123.5 %	140.0 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				109.8 %
N-1: Bell - Westside 230 kV + N-1: Dworshak - Hatwai 500 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.7 %
N-1: Bell - Westside 230 kV + N-1: Dworshak - Taft 500 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.8 %
N-1: Bell - Westside 230 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		107.0 %	114.9 %	131.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	115.0 %	124.3 %	133.2 %	151.9 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1			103.4 %	117.0 %
N-1: Bell - Westside 230 kV + N-1: Metro - Sunset 115 kV				

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			104.3 %	120.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	105.3 %	114.2 %	122.4 %	139.9 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				109.5 %
N-1: Bell - Westside 230 kV + N-1: Ninth & Central - Otis Orchards 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.6 %
N-1: Bell - Westside 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				106.1 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		104.4 %	111.4 %	125.9 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				100.7 %
N-1: Bell - Westside 230 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1	112.9 %	122.9 %	132.0 %	150.7 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	129.9 %	140.6 %	150.6 %	171.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1		107.2 %	114.4 %	129.0 %
SOUTHEAS (48395) -> SUNSET (48421) CKT 1				101.3 %
WEST (48463)	1.0061			
N-1: Bell - Westside 230 kV + N-1: Ross Park - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				102.6 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.5 %	108.3 %	122.5 %
N-1: Bell - Westside 230 kV + S-1: Airway Heights 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				111.3 %
N-1: Bell - Westside 230 kV + S-1: Sunset 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				112.5 %
N-1: Bell - Westside 230 kV + S-1: Third & Hatch 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				112.0 %
N-1: Bell - Westside 230 kV + T-1: Addy #3 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			102.6 %	115.6 %
N-1: Bell - Westside 230 kV + T-1: Nine Mile #2 115/13.8 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				110.0 %
N-1: Bell - Westside 230 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				112.8 %
N-1: Bell - Westside 230 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				112.2 %
N-1: Benewah - Boulder 230 kV + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			105.8 %	117.0 %
N-1: Benewah - Boulder 230 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				112.1 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	101.0 %	109.8 %	117.5 %	131.8 %
N-1: Benewah - Boulder 230 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				101.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			107.0 %	120.4 %
N-1: Benewah - Boulder 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.7 %
N-1: Benewah - Boulder 230 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			103.4 %	114.6 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	104.3 %	113.9 %	121.9 %	134.5 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				106.1 %
N-1: Benewah - Boulder 230 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.1 %
N-1: Benewah - Boulder 230 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.5 %
N-1: Benewah - Boulder 230 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.8 %
N-1: Benewah - Moscow 230 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	100.0 %			
N-1: Benewah - Moscow 230 230 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.2 %
N-1: Benewah - Moscow 230 230 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			102.2 %	113.4 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	103.0 %	112.6 %	120.7 %	
N-1: Benewah - Pine Creek 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.0 %
N-1: Benewah - Thornton 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.7 %
N-1: Benewah - Thornton 230 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.0 %
N-1: Benewah - Thornton 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.3 %

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
N-1: Bonners Ferry - Libby 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.5 %
N-1: Boulder - Otis Orchards #1 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Boulder - Otis Orchards #2 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				102.9 %
N-1: Bronx - Cabinet 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Brownlee - Hells Canyon 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Burke - Thompson Falls B 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.2 %
N-1: Burke - Thompson Falls B 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Cabinet - Noxon 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.2 %
N-1: Cabinet - Noxon 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.6 %
N-1: Coeur d'Alene 15th St - Pine Creek 115 kV (PIN-BCR) + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Coeur d'Alene 15th St - Ramsey 115 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Coeur d'Alene 15th St - Rathdrum 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.9 %
N-1: College & Walnut - Post Street 115 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			101.0 %	113.7 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	101.6 %	111.1 %	119.3 %	133.5 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.4 %
N-1: College & Walnut - Post Street 115 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				101.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			107.4 %	120.6 %
N-1: College & Walnut - Post Street 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.1 %
N-1: College & Walnut - Post Street 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		106.2 %	114.3 %	128.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	113.4 %	123.7 %	132.6 %	148.3 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1			103.1 %	114.6 %
N-1: College & Walnut - Post Street 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.3 %
N-1: College & Walnut - Westside 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.8 %
N-1: College & Walnut - Westside 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1	108.2 %	118.4 %	127.1 %	142.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	125.0 %	135.9 %	145.5 %	162.4 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1		104.2 %	111.1 %	123.4 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1				112.7 %
WEST (48461) -> SPKWASTE (48409) CKT 1		106.0 %	113.0 %	129.6 %
N-1: College & Walnut - Westside 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.4 %
N-1: College & Walnut - Westside 115 kV + N-1: Sunset - Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.0 %
N-1: Columbia - Larson 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.6 %
N-1: Columbia Falls - Flathead 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.6 %
N-1: Columbia Falls - Hungry Horse 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Columbia Falls - Kalispel 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Conkelley - Hungry Horse 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Conkelley - Libby 230 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.1 %
N-1: Conkelley - Libby 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.3 %

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
N-1: Coulee - Westside 230 kV + N-1: Addy - Devils Gap 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.1 %
N-1: Coulee - Westside 230 kV + N-1: Airway Heights - Devils Gap 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.0 %
N-1: Coulee - Westside 230 kV + N-1: Beacon - Ross Park 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				102.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		102.7 %	109.6 %	121.8 %
N-1: Coulee - Westside 230 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			102.5 %	116.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	103.8 %	112.5 %	120.6 %	135.9 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				106.8 %
N-1: Coulee - Westside 230 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				105.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		102.6 %	110.1 %	124.5 %
N-1: Coulee - Westside 230 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				109.7 %
N-1: Coulee - Westside 230 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		100.7 %	108.2 %	120.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	108.8 %	118.2 %	126.7 %	140.8 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				110.0 %
N-1: Coulee - Westside 230 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.8 %
N-1: Coulee - Westside 230 kV + T-1: Addy #3 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				101.6 %
N-1: Coulee - Westside 230 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				108.6 %
N-1: Coulee - Westside 230 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.0 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			101.5 %	115.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	102.4 %	111.5 %	119.7 %	135.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				106.4 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				103.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.3 %	108.9 %	123.3 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.2 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			102.7 %	114.4 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	103.3 %	113.0 %	121.2 %	134.5 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				106.1 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.4 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Addy #3 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				100.5 %
N-1: Dry Creek - North Lewiston 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Dry Creek - Talbot 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.4 %
N-1: Dworshak - Taft 500 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.1 %
N-1: Francis & Cedar - Northwest 115 kV + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				101.6 %
N-1: Francis & Cedar - Ross Park 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			105.5 %	116.1 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	104.5 %	115.4 %	123.9 %	136.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				107.1 %
N-1: Francis & Cedar - Ross Park 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.0 %
N-1: Frenchman - Potholes (G) - Sand Dunes 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Hatwai - Moscow 230 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Hatwai - Moscow 230 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Hatwai - North Lewiston 230 kV + N-1: Post Street - Third & Hatch 115 kV				

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.6 %
N-1: Hot Springs - Noxon #2 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.4 %
N-1: Hot Springs - Placid Lake 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Hot Springs - Taft 500 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.1 %
N-1: Larson - Wheeler 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Lind - Shawnee 115 kV (SHN-EWN) + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Lind - Shawnee 115 kV (SHN-EWN) + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Lolo - Oxbow 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.1 %
N-1: Metro - Post Street 115 kV + N-1: Boulder - Post Falls 115 kV Open @ BLD				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.2 %
N-1: Metro - Post Street 115 kV + N-1: Moscow 230 - Orofino 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + N-1: Nine Mile - Westside 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				111.6 %
N-1: Metro - Post Street 115 kV + N-1: Ninth & Central - Otis Orchards 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			101.3 %	114.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	102.7 %	111.5 %	119.4 %	133.9 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.4 %
N-1: Metro - Post Street 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			100.2 %	113.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	101.5 %	110.3 %	118.2 %	132.8 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Metro - Post Street 115 kV + N-1: Pine Street - Rathdrum 115 kV (PNST-HOO)				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.1 %
N-1: Metro - Post Street 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			105.5 %	118.7 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	105.6 %	115.4 %	123.8 %	138.6 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				108.5 %
N-1: Metro - Post Street 115 kV + N-1: Ramsey - Rathdrum #3 115 kV Open @ RAT				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + N-1: Rathdrum #1 230/115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.2 %
N-1: Metro - Post Street 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				128.6 %
N-1: Metro - Post Street 115 kV + N-1: Shawnee - Sunset 115 kV (SHN-ECL)				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + N-1: Shawnee - Terre View 115 kV (SHN-TUR)				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + N-1: Sunset - Westside 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1	124.4 %	129.0 %	136.3 %	151.5 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	140.3 %	145.5 %	153.8 %	170.9 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1	105.3 %	109.2 %	115.5 %	128.0 %
N-1: Metro - Post Street 115 kV + S-1: Airway Heights 115kV Switched Shunt				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			100.8 %	113.5 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	101.8 %	111.4 %	119.5 %	133.8 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				106.0 %
N-1: Metro - Post Street 115 kV + S-1: Moscow 115kV Switched Shunt				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + S-1: Sand Creek 115kV Switched Shunt				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + S-1: Sand Point 115kV Switched Shunt				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + S-1: Spokane Ind Park 115kV Switched Shunt				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + S-1: Sunset 115kV Switched Shunt				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			102.8 %	115.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	103.6 %	113.5 %	121.6 %	135.7 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				107.4 %
N-1: Metro - Post Street 115 kV + S-1: Third & Hatch 115kV Switched Shunt				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				112.1 %

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	100.5 %	109.4 %	117.3 %	132.0 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Metro - Post Street 115 kV + T-1: Beacon #1 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				103.2 %
N-1: Metro - Post Street 115 kV + T-1: Beacon #2 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				103.2 %
N-1: Metro - Post Street 115 kV + T-1: Cabinet Gorge (34) 230/13.8 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + T-1: Moscow 230/115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + T-1: Nine Mile #2 115/13.8 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				111.6 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	100.2 %	109.1 %	117.0 %	
N-1: Metro - Post Street 115 kV + T-1: Pine Creek #1 230/115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.2 %
N-1: Metro - Post Street 115 kV + T-1: Upriver 13.8/2.4 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.2 %
N-1: Metro - Post Street 115 kV + T-1: Upriver 13.8/4.2 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
N-1: Metro - Post Street 115 kV + T-1: Westside #1 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		104.3 %	112.0 %	127.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	112.4 %	121.5 %	130.2 %	147.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1			101.4 %	113.8 %
N-1: Metro - Post Street 115 kV + T-1: Westside #2 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1		102.7 %	110.3 %	125.1 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	110.7 %	119.9 %	128.4 %	144.9 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1			100.4 %	112.5 %
N-1: Metro - Sunset 115 kV + N-1: Nine Mile - Westside 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.2 %
N-1: Metro - Sunset 115 kV + N-1: Ninth & Central - Otis Orchards 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				103.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.6 %	108.9 %	122.5 %
N-1: Metro - Sunset 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				103.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.3 %	108.7 %	122.5 %
N-1: Metro - Sunset 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			116.0 %	130.1 %
N-1: Metro - Sunset 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				117.0 %
N-1: Metro - Sunset 115 kV + N-1: Sunset - Westside 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1	110.2 %	114.0 %	120.2 %	133.4 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	125.4 %	129.9 %	137.1 %	152.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1			104.6 %	116.0 %
N-1: Metro - Sunset 115 kV + N-1: Trentwood - Vera Tap 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.1 %
N-1: Metro - Sunset 115 kV + S-1: Airway Heights 115kV Switched Shunt				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				101.6 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.0 %	108.4 %	121.8 %
N-1: Metro - Sunset 115 kV + S-1: Sunset 115kV Switched Shunt				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				103.1 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		102.8 %	110.4 %	123.5 %
N-1: Metro - Sunset 115 kV + S-1: Third & Hatch 115kV Switched Shunt				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				101.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			106.7 %	120.5 %
N-1: Metro - Sunset 115 kV + T-1: Nine Mile #2 115/13.8 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.5 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			106.4 %	119.9 %
N-1: Metro - Sunset 115 kV + T-1: Westside #1 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			101.7 %	115.9 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	102.9 %	111.6 %	119.6 %	135.5 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				106.5 %
N-1: Metro - Sunset 115 kV + T-1: Westside #2 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				113.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	101.3 %	109.9 %	117.9 %	133.3 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.1 %
N-1: Moscow 230 - Orofino 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
N-1: Moscow 230 - Terre View 115 kV (M23-NMO) + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Moscow City - North Lewiston 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Nine Mile - Westside 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.7 %
N-1: Ninth & Central - Otis Orchards 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				109.8 %
N-1: Ninth & Central - Otis Orchards 115 kV + N-1: Post Street - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			106.7 %	118.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	107.2 %	116.9 %	125.1 %	138.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				108.2 %
N-1: Ninth & Central - Otis Orchards 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.6 %
N-1: Ninth & Central - Otis Orchards 115 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				108.1 %
N-1: Ninth & Central - Otis Orchards 115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.5 %
N-1: Ninth & Central - Third & Hatch 115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				132.7 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.0 %
N-1: Ninth & Central - Third & Hatch 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1	106.0 %	113.2 %	120.8 %	135.0 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	121.2 %	129.6 %	138.1 %	153.7 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1			105.6 %	117.0 %
N-1: Ninth & Central - Third & Hatch 115 kV + N-1: Sunset - Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.4 %
N-1: Ninth & Central - Third & Hatch 115 kV + S-1: Airway Heights 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.5 %
N-1: Ninth & Central - Third & Hatch 115 kV + S-1: Otis Orchards 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.0 %
N-1: Ninth & Central - Third & Hatch 115 kV + S-1: Sunset 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.3 %
N-1: Ninth & Central - Third & Hatch 115 kV + S-1: Third & Hatch 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.1 %
N-1: Ninth & Central - Third & Hatch 115 kV + S-1: Trentwood 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.2 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Nine Mile #2 115/13.8 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.8 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Westside #1 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				101.7 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1		101.5 %	108.3 %	121.2 %
N-1: Ninth & Central - Third & Hatch 115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			106.5 %	118.9 %
N-1: North Lewiston - Shawnee 230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.4 %
N-1: North Lewiston - Shawnee 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.9 %
N-1: Noxon - Pine Creek 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.5 %
N-1: Pine Street - Rathdrum 115 kV (PNST-HOO) + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.5 %
N-1: Pine Street - Rathdrum 115 kV (RAT-SPL) + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Boulder - Post Falls 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.0 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Ramsey - Rathdrum #3 115 kV Open @ RAM				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Ramsey - Rathdrum #3 115 kV Open @ RAT				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Rathdrum #2 230/115 kV				

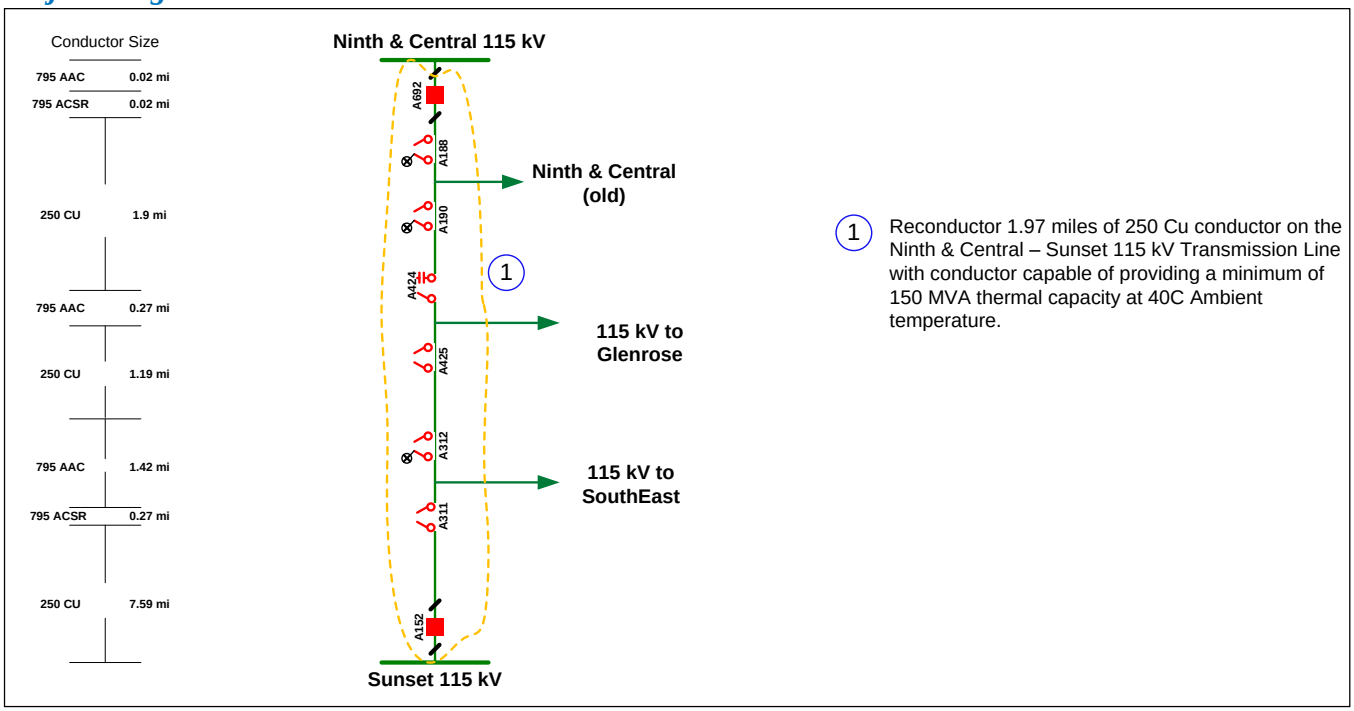
Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				127.1 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Shawnee - South Pullman 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Shawnee - Sunset 115 kV (SHN-ECL)				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Sunset - Westside 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			106.2 %	116.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	111.7 %	117.2 %	124.5 %	136.0 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				106.8 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Trentwood - Vera Tap 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			102.4 %	113.6 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	103.1 %	112.8 %	120.8 %	
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.5 %
N-1: Post Street - Third & Hatch 115 kV + S-1: Airway Heights 115kV Switched Shunt				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			105.0 %	115.7 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	105.2 %	115.5 %	123.7 %	136.1 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				107.5 %
N-1: Post Street - Third & Hatch 115 kV + S-1: Sand Creek 115kV Switched Shunt				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Post Street - Third & Hatch 115 kV + S-1: Spokane Ind Park 115kV Switched Shunt				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
N-1: Post Street - Third & Hatch 115 kV + S-1: Sunset 115kV Switched Shunt				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			107.1 %	117.5 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	107.0 %	117.7 %	125.9 %	138.0 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				108.7 %
N-1: Post Street - Third & Hatch 115 kV + S-1: Trentwood 115kV Switched Shunt				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.9 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Nine Mile #1 115/2				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Nine Mile #2 115/13.8 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1			102.5 %	113.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	103.2 %	112.9 %	121.0 %	133.8 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Pine Creek #2 230/115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Rattlesnake #1 230/161 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.6 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Upriver 13.8/4.2 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Westside #1 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1	106.5 %	115.9 %	124.4 %	139.8 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	123.3 %	133.5 %	142.9 %	159.9 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1		102.7 %	109.5 %	121.9 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Westside #2 230/115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1	103.7 %	113.2 %	121.5 %	136.2 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	120.5 %	130.7 %	140.0 %	156.3 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1		101.0 %	107.7 %	119.7 %
N-1: Rocky Reach - Columbia #2 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
N-1: Ross Park - Third & Hatch 115 kV + N-1: Sunset - Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.4 %
N-1: Ross Park - Third & Hatch 115 kV + S-1: Airway Heights 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.5 %
N-1: Ross Park - Third & Hatch 115 kV + S-1: Sunset 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.4 %
N-1: Ross Park - Third & Hatch 115 kV + S-1: Third & Hatch 115kV Switched Shunt				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.8 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			105.3 %	118.0 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			103.7 %	116.0 %
N-1: Shawnee - Thornton 230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.3 %
S-1: Airway Heights 115kV Switched Shunt + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.4 %
S-1: Airway Heights 115kV Switched Shunt + T-1: Westside #2 230/115 kV				

Row Labels	16HSLH	20HSLH	25HSLH	35HSLH
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				105.7 %
S-1: Bell 230kV Switched Shunt + N-1: Beacon - Ross Park 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1			105.1 %	116.6 %
S-1: Bell 230kV Switched Shunt + N-1: Metro - Post Street 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				111.6 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				131.5 %
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.3 %
S-1: Bell 230kV Switched Shunt + N-1: Metro - Sunset 115 kV				
GLENTAP (48139) -> SOUTHEAS (48395) CKT 1				100.3 %
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				119.9 %
S-1: Bell 230kV Switched Shunt + N-1: Ninth & Central - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.9 %
S-1: Bell 230kV Switched Shunt + N-1: Ross Park - Third & Hatch 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.7 %
S-1: Bell 230kV Switched Shunt + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.5 %
S-1: Bell 230kV Switched Shunt + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				104.8 %
S-1: Benewah 230kV Switched Shunt + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.3 %
S-1: Dry Creek 230kV Switched Shunt + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.8 %
S-1: Sunset 115kV Switched Shunt + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				108.4 %
S-1: Sunset 115kV Switched Shunt + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.6 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Westside #1 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				108.2 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				106.4 %
T-1: Bell #1 500/230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.4 %
T-1: Benewah 230/115 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				105.0 %
T-1: Hot Springs 500/230 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.1 %
T-1: Rattlesnake #1 230/161 kV + N-1: Metro - Post Street 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				103.1 %
T-1: Sickler-Douglas #1 500/230 kV + N-1: Post Street - Third & Hatch 115 kV				
NINTHCNT_S (48272) -> NINTHCNT_OLD (48270) CKT 1				104.7 %
T-1: Westside #1 230/115 kV + T-1: Westside #2 230/115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	109.3 %	115.9 %	123.5 %	139.9 %
P7				
N-2 (STR): Bell - Coulee #3 230 kV & Bell - Westside 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				107.4 %
N-2 (STR): Bell - Westside 230 kV & Coulee - Westside 230 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	109.4 %	115.9 %	123.5 %	140.0 %
SSEE				
N-2 (ROW and ADJ): College & Walnut - Westside 115 kV and Sunset - Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1				103.0 %
N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV				
NINTHCNT_OLD (48270) -> GLENTAP (48139) CKT 1	106.3 %	112.8 %	120.2 %	136.3 %

Light Scenario Assessment Results

No potential violations identified

Project Diagram



7.3.3 Need Further Analysis

The following sections describe system deficiencies assuming completion of the planned projects as described above.

Garden Springs Station Integration

Project Scope/Description

The Garden Springs Station is a proposed 230/115 kV station located on the southwest edge of Spokane. The existing Spokane area transmission system is constrained by limited 230/115 kV transformation. A new 250 MVA 230/115 kV transformer at the Garden Springs Station and replacing the existing Westside #1 & #2 230/115 kV Transformers with 250 MVA nominally rated transformers has been shown to significantly improve the performance of the transmission system in the Spokane area.

The integration of the Garden Springs Station will require the construction of new 230 kV transmission lines to connect the new substation to existing 230 kV infrastructure in the area. Full build out will include two separate 230 kV transmission lines terminated at Garden Springs Station. Construction phasing will likely facilitate the ability to construct only one 230 kV transmission line initially and the second will be constructed as needed to continue meeting load service reliability issues. Several options for integrating the Garden Springs Station have been presented and evaluated. The preferred options to be further assessed includes a 230 kV transmission line from Garden Springs to a new station located adjacent to the BPA Bell – Coulee transmission corridor.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2020 heavy summer.

Schedule coordination with the Ninth & Central 230 kV Integration project is necessary to determine the impacts of the projects. Several issues previously identified to be mitigated by the Garden Springs 230 kV Integration project will be mitigated by the Ninth & Central 230 kV Integration project.

Performance Criteria Violations

Heavy Summer Assessment Results

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
NA			
RES: N-1: South Fairchild Tap 115 Open @ GDN			
SUNSET (48421) -> HANGMAN (48145) CKT 1			102.5 %
RES: N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV			
WEST (48463)			0.9967
P1			
N-1: Bell - Westside 230 kV			
WEST (48463)			1.0057
P2			
BF: A413 Westside 115 kV, Ninemile-Westside			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			112.0 %
BF: A470 Westside 115 kV, College & Walnut-Westside			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			102.4 %
BF: A688 Ninth & Central North & South 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			110.8 %
BUS: Westside 115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			115.9 %
BUS: Westside 230 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			107.3 %
P5			
PSF: Westside 115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			114.6 %
P6			
N-1: Airway Heights - Devils Gap 115 kV + N-1: Garden Springs - Westside 115 kV			
WEST (48461) -> FTWRIGHT (48129) CKT 1			109.7 %
METRO (48225) -> SUNSET (48421) CKT 1		102.0 %	114.7 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Metro - Post Street 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			108.8 %
WEST (48461) -> SPKWASTE (48409) CKT 1	104.9 %	111.1 %	124.9 %
N-1: Beacon - Bell #5 230 kV + N-1: Northwest - Westside 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			103.1 %
N-1: Beacon - Ross Park 115 kV + N-1: Garden Springs - Westside 115 kV			
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			103.7 %
WEST (48461) -> NORTHWES (48279) CKT 1			103.5 %
N-1: Beacon - Ross Park 115 kV + N-1: Northwest - Westside 115 kV			
BELL TAP (48033) -> SEVENTAP (48381) CKT 1		101.1 %	111.6 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			101.5 %
WEST (48461) -> SPKWASTE (48409) CKT 1			106.5 %
N-1: College & Walnut - Post Street 115 kV + N-1: Francis & Cedar - Northwest 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			103.5 %
N-1: College & Walnut - Post Street 115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			102.9 %
WEST (48461) -> NORTHWES (48279) CKT 1			100.3 %
N-1: College & Walnut - Westside 115 kV + N-1: Francis & Cedar - Northwest 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			107.0 %
WEST (48461) -> SPKWASTE (48409) CKT 1	100.6 %	107.3 %	122.9 %
N-1: College & Walnut - Westside 115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1	100.9 %	107.0 %	120.7 %

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
THIRHACH (48431) -> POSTSTRT (48339) CKT 1		102.1 %	119.1 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	101.4 %	107.1 %	120.5 %
WEST (48461) -> NORTHWES (48279) CKT 1		104.0 %	116.8 %
N-1: College & Walnut - Westside 115 kV + N-1: Metro - Post Street 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			102.8 %
N-1: College & Walnut - Westside 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			100.3 %
N-1: College & Walnut - Westside 115 kV + N-1: Northwest - Westside 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1		101.1 %	113.8 %
WEST (48461) -> SPKWASTE (48409) CKT 1	108.0 %	115.1 %	131.7 %
N-1: College & Walnut - Westside 115 kV + N-1: Post Street - Third & Hatch 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			103.5 %
WEST (48461) -> SPKWASTE (48409) CKT 1		101.4 %	118.2 %
N-1: Francis & Cedar - Northwest 115 kV + N-1: Metro - Post Street 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			105.7 %
N-1: Metro - Post Street 115 kV + N-1: Ninth & Central - Sunset 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			103.0 %
WEST (48461) -> SPKWASTE (48409) CKT 1			117.5 %
N-1: Metro - Post Street 115 kV + N-1: Northwest - Westside 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			110.4 %
N-1: Metro - Sunset 115 kV + N-1: Ninth & Central - Sunset 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			102.4 %
N-1: Ninth & Central - Sunset 115 kV + N-1: Garden Springs - Westside 115 kV			
METRO (48225) -> SUNSET (48421) CKT 1			109.8 %
N-1: Ninth & Central - Third & Hatch 115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			100.2 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Garden Springs - Westside 115 kV			
WEST (48461) -> FTWRIGHT (48129) CKT 1		103.9 %	119.3 %
FTWRIGHT (48129) -> COLLWALN (48081) CKT 1			101.7 %
N-1: Ross Park - Third & Hatch 115 kV + N-1: Garden Springs - Westside 115 kV			
WEST (48461) -> FTWRIGHT (48129) CKT 1			111.0 %
N-1: WESTSIDE #3 230/115 kV + N-1: WESTSIDE #4 230/115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			107.4 %
S-1: Airway Heights 115kV Switched Shunt + N-1: Airway Heights - Garden Springs 115 kV			
AIRWAYHT (48009)			0.9434
FAIRCHLD (40397)		0.95	0.9419
SILVRLK2 (48388)		0.9467	0.9382
W.PLAINS (47513)			0.9472
P7			
N-2 (STR): Bell - Coulee #3 230 kV & Bell - Westside 230 kV			
WEST (48463)			1.005
N-2 (STR): Bell - Westside 230 kV & Coulee - Westside 230 kV			
WEST (48463)			0.988

Heavy Winter Assessment Results

Row Labels	20HWPROJECTS	25HWPROJECTS	35HWPROJECTS
NA			
RES: N-1: South Fairchild Tap 115 Open @ GDN			
CHENEY (40215)			0.9499
FOURLBPA (48125)			0.9455
HAYFORD (40525)			0.9449
RES: N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV			
WEST (48463)		0.9928	0.9956
P1			
N-1: Bell - Westside 230 kV			
WEST (48463)		1.0079	1.0031
P2			
BF: A413 Westside 115 kV, Ninemile-Westside			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			100.2 %
BF: A688 Ninth & Central North & South 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			100.7 %

Row Labels	20HWPROJECTS	25HWPROJECTS	35HWPROJECTS
BUS: Westside 115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			102.3 %
P5			
PSF: Westside 115 kV			
CHENEY (40215)			0.95
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			100.3 %
P6			
N-1: Airway Heights - Devils Gap 115 kV + N-1: Garden Springs - Westside 115 kV			
POSTSTRT (48339) -> METRO (48225) CKT 1			104.3 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Metro - Post Street 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1		102.9 %	114.1 %
N-1: College & Walnut - Westside 115 kV + N-1: Francis & Cedar - Northwest 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1		100.1 %	110.4 %
N-1: College & Walnut - Westside 115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			106.7 %
WEST (48461) -> NORTHWES (48279) CKT 1		105.4 %	113.5 %
N-1: College & Walnut - Westside 115 kV + N-1: Metro - Post Street 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.4 %
N-1: College & Walnut - Westside 115 kV + N-1: Northwest - Westside 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1		105.2 %	115.9 %
N-1: College & Walnut - Westside 115 kV + N-1: Post Street - Third & Hatch 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			112.0 %
N-1: Francis & Cedar - Northwest 115 kV + N-1: Metro - Post Street 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.9 %
N-1: Metro - Post Street 115 kV + N-1: Garden Springs - Westside 115 kV			
SOUTHEAS (48395) -> SUNSET (48421) CKT 1			100.2 %
N-1: Metro - Post Street 115 kV + N-1: Ninth & Central - Sunset 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1	104.1 %	111.3 %	129.2 %
N-1: Metro - Post Street 115 kV + N-1: Northwest - Westside 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			104.8 %
N-1: Metro - Sunset 115 kV + N-1: Ninth & Central - Sunset 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1		101.8 %	118.7 %
N-1: Ninth & Central - Sunset 115 kV + N-1: Garden Springs - Westside 115 kV			
METRO (48225) -> SUNSET (48421) CKT 1			108.2 %
POSTSTRT (48339) -> METRO (48225) CKT 1		100.3 %	116.2 %
P7			
N-2 (STR): Bell - Coulee #3 230 kV & Bell - Westside 230 kV			
WEST (48463)		1.007	1.0021
N-2 (STR): Bell - Westside 230 kV & Coulee - Westside 230 kV			
WEST (48463)		0.9923	0.9858

Heavy Summer Low Hydro Assessment Results

Row Labels	20HSPROJECTSLH	25HSPROJECTSLH	35HSPROJECTSLH
NA			
RES: N-1: South Fairchild Tap 115 Open @ GDN			
SUNSET (48421) -> HANGMAN (48145) CKT 1			102.5 %
RES: N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV			
WEST (48463)			0.9949
P1			
N-1: Bell - Westside 230 kV			
WEST (48463)			1.0004
P2			
BF: A413 Westside 115 kV, Ninemile-Westside			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	125.3 %	134.1 %	153.8 %
BF: A470 Westside 115 kV, College & Walnut-Westside			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	117.7 %	126.1 %	144.8 %
BF: A688 Ninth & Central North & South 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1	113.9 %	120.6 %	134.2 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			100.5 %
WEST (48461) -> SPKWASTE (48409) CKT 1		101.1 %	114.3 %
BUS: Ninth & Central South 115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			100.2 %
WEST (48461) -> SPKWASTE (48409) CKT 1			109.3 %

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
BUS: Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1	108.6 %	114.8 %	128.9 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	129.4 %	138.6 %	158.7 %
BUS: Westside 230 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1		101.6 %	113.4 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	118.0 %	126.1 %	143.6 %
N-1: College & Walnut - Westside 115 kV Open @ WES			
WEST (48461) -> SPKWASTE (48409) CKT 1			111.4 %
P5			
PSF: Westside 115 kV			
BEACON N (48023) -> ROSSPARK (48371) CKT 1		101.6 %	113.8 %
BEACON N (48025) -> BEACON N (48023) CKT 1		100.6 %	108.5 %
BEACON S (48031) -> BEACON S (48029) CKT 1			105.8 %
ROSSPARK (48371) -> THIRHACH (48431) CKT 1	108.1 %	114.3 %	128.4 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	127.6 %	136.7 %	156.7 %
P6			
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Bell - Westside 230 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			102.1 %
N-1: 3TM Bell - Boundary #3 230 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			100.8 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			100.1 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			104.7 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			108.5 %
METRO (48225) -> SUNSET (48421) CKT 1			110.9 %
N-1: Airway Heights - Devils Gap 115 kV + N-1: Metro - Post Street 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			106.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1	101.8 %	108.0 %	121.9 %
N-1: Beacon - Bell #4 230 kV + N-1: Garden Springs - Westside 115 kV			
WEST (48461) -> FTWRIGHT (48129) CKT 1			104.3 %
N-1: Beacon - Bell #5 230 kV + N-1: Metro - Post Street 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			113.7 %
N-1: Beacon - Bell #5 230 kV + N-1: Northwest - Westside 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			100.8 %
WEST (48461) -> SPKWASTE (48409) CKT 1		101.4 %	114.8 %
N-1: Beacon - Boulder 230 kV + N-1: Northwest - Westside 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			110.3 %
N-1: Beacon - Ross Park 115 kV + N-1: Garden Springs - Westside 115 kV			
WEST (48461) -> FTWRIGHT (48129) CKT 1			108.5 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			106.2 %
WEST (48461) -> NORTHWES (48279) CKT 1			105.6 %
N-1: Beacon - Ross Park 115 kV + N-1: Northwest - Westside 115 kV			
BELL TAP (48033) -> SEVENTAP (48381) CKT 1	102.7 %	108.5 %	118.4 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			103.5 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			106.5 %
WEST (48461) -> SPKWASTE (48409) CKT 1		104.2 %	118.2 %
N-1: Bell - Westside 230 kV + N-1: College & Walnut - Westside 115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			102.6 %
N-1: College & Walnut - Post Street 115 kV + N-1: Francis & Cedar - Northwest 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			101.7 %
WEST (48461) -> SPKWASTE (48409) CKT 1		102.4 %	116.0 %
N-1: College & Walnut - Post Street 115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1	106.2 %	111.3 %	123.0 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1		105.2 %	119.8 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			103.4 %
WEST (48461) -> NORTHWES (48279) CKT 1			103.0 %
N-1: College & Walnut - Post Street 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			105.3 %
N-1: College & Walnut - Post Street 115 kV + N-1: Post Street - Third & Hatch 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			103.2 %
WEST (48461) -> SPKWASTE (48409) CKT 1		103.1 %	117.7 %
N-1: College & Walnut - Westside 115 kV + N-1: Francis & Cedar - Northwest 115			

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1		104.4 %	116.6 %
WEST (48461) -> SPKWASTE (48409) CKT 1	113.3 %	119.4 %	135.2 %
N-1: College & Walnut - Westside 115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1	120.9 %	127.0 %	140.9 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	121.6 %	129.5 %	146.5 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	105.1 %	110.0 %	123.9 %
WEST (48461) -> NORTHWES (48279) CKT 1	101.2 %	106.1 %	119.5 %
N-1: College & Walnut - Westside 115 kV + N-1: Metro - Post Street 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			103.7 %
WEST (48461) -> SPKWASTE (48409) CKT 1		103.9 %	118.5 %
N-1: College & Walnut - Westside 115 kV + N-1: Ninth & Central - Sunset 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1		100.5 %	113.7 %
N-1: College & Walnut - Westside 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1	103.4 %	108.4 %	119.6 %
WEST (48461) -> SPKWASTE (48409) CKT 1			110.2 %
N-1: College & Walnut - Westside 115 kV + N-1: Northwest - Westside 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1	105.4 %	110.5 %	123.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1	120.6 %	127.1 %	144.0 %
N-1: College & Walnut - Westside 115 kV + N-1: Post Street - Third & Hatch 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1	101.2 %	106.9 %	120.1 %
WEST (48461) -> SPKWASTE (48409) CKT 1	115.2 %	122.4 %	139.3 %
N-1: Coulee - Westside 230 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			100.3 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Airway Heights - Garden Springs 115 kV			
ADDY (40017) -> CHEWELAH (48071) CKT 1			101.7 %
AIRWAYHT (48009)		0.923	0.8471
DEVILGPE (48103)		0.9314	0.8699
DEVILGPW (48105)		0.9314	0.8699
FAIRCHLD (40397)		0.9215	0.8454
FORD (48123)		0.9376	0.8811
GAFFNEY (40449)		0.9282	0.8658
LITTFALL (48193)		0.931	0.8695
LONGLAKE (48201)		0.9314	0.8699
LONGLAKT (48203)		0.9323	0.8716
LONGLAKW (48199)		0.9314	0.8699
REARDAN (48363)		0.9294	0.8673
SILVRLK2 (48388)	0.9471	0.9181	0.8413
SPRAGUE (48411)		0.9278	0.8653
VALLEY A (48441)			0.9285
W.PLAINS (47513)		0.9228	0.848
N-1: Devils Gap - Nine Mile 115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			101.0 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			105.7 %
METRO (48225) -> SUNSET (48421) CKT 1			103.7 %
N-1: Devils Gap - Nine Mile 115 kV + N-1: Metro - Post Street 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			102.9 %
WEST (48461) -> SPKWASTE (48409) CKT 1		102.3 %	117.5 %
N-1: Francis & Cedar - Northwest 115 kV + N-1: Metro - Post Street 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			105.1 %
WEST (48461) -> SPKWASTE (48409) CKT 1		105.4 %	120.3 %
N-1: Francis & Cedar - Ross Park 115 kV + N-1: Metro - Post Street 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			111.8 %
N-1: Garden Springs - Westside 115 kV + N-1: WESTSIDE #4 230/115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			102.2 %
N-1: Metro - Post Street 115 kV + N-1: Garden Springs - Westside 115 kV			
SOUTHEAS (48395) -> SUNSET (48421) CKT 1		102.9 %	118.1 %
N-1: Metro - Post Street 115 kV + N-1: Nine Mile - Westside 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			101.9 %
WEST (48461) -> SPKWASTE (48409) CKT 1		100.8 %	116.2 %
N-1: Metro - Post Street 115 kV + N-1: Ninth & Central - Sunset 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1	104.2 %	111.1 %	125.8 %

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
WEST (48461) -> SPKWASTE (48409) CKT 1	119.1 %	128.0 %	146.9 %
N-1: Metro - Post Street 115 kV + N-1: Northwest - Westside 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			108.7 %
WEST (48461) -> SPKWASTE (48409) CKT 1	103.1 %	109.5 %	124.9 %
N-1: Metro - Sunset 115 kV + N-1: Garden Springs - Westside 115 kV			
SOUTHEAS (48395) -> SUNSET (48421) CKT 1			105.7 %
N-1: Metro - Sunset 115 kV + N-1: Ninth & Central - Sunset 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1		100.8 %	114.1 %
WEST (48461) -> SPKWASTE (48409) CKT 1	106.6 %	114.7 %	131.8 %
N-1: Nine Mile - Westside 115 kV + N-1: Airway Heights - Garden Springs 115 kV			
AIRWAYHT (48009)			0.9065
DEVILGPE (48103)			0.9226
DEVILGPW (48105)			0.9226
FAIRCHLD (40397)			0.9049
GAFFNEY (40449)			0.919
LITTFALL (48193)			0.9222
LONGLAKE (48201)			0.9226
LONGLAKT (48203)			0.9236
LONGLAKW (48199)			0.9226
NINEMILE (48269)			0.9288
REARDAN (48363)			0.9204
SILVRLK2 (48388)			0.9011
SPRAGUE (48411)			0.9185
W.PLAINS (47513)			0.9069
N-1: Ninth & Central - Sunset 115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1		101.3 %	112.5 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	102.5 %	110.4 %	123.5 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			106.6 %
METRO (48225) -> SUNSET (48421) CKT 1	114.2 %	122.3 %	139.8 %
POSTSTRT (48339) -> METRO (48225) CKT 1		103.4 %	118.0 %
N-1: Ninth & Central - Sunset 115 kV + N-1: Ninth & Central - Third & Hatch 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			108.3 %
N-1: Ninth & Central - Sunset 115 kV + N-1: Post Street - Third & Hatch 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			105.7 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			102.7 %
WEST (48461) -> SPKWASTE (48409) CKT 1		106.1 %	120.9 %
N-1: Ninth & Central - Third & Hatch 115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1	103.3 %	108.6 %	120.0 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			102.9 %
N-1: Ninth & Central - Third & Hatch 115 kV + N-1: Ross Park - Third & Hatch 115 kV			
WEST (48461) -> FTWRIGHT (48129) CKT 1			105.7 %
N-1: Post Street - Third & Hatch 115 kV + N-1: Garden Springs - Westside 115 kV			
WEST (48461) -> FTWRIGHT (48129) CKT 1	115.1 %	121.9 %	137.6 %
FTWRIGHT (48129) -> COLLWALN (48081) CKT 1		106.0 %	120.0 %
N-1: Ross Park - Third & Hatch 115 kV + N-1: Garden Springs - Westside 115 kV			
WEST (48461) -> FTWRIGHT (48129) CKT 1	105.3 %	110.7 %	123.3 %
FTWRIGHT (48129) -> COLLWALN (48081) CKT 1			106.4 %
N-1: WESTSIDE #3 230/115 kV + N-1: Garden Springs - Westside 115 kV			
ROSSPARK (48371) -> THIRHACH (48431) CKT 1			102.2 %
N-1: WESTSIDE #3 230/115 kV + N-1: WESTSIDE #4 230/115 kV			
BEACON N (48023) -> ROSSPARK (48371) CKT 1		103.8 %	116.5 %
BEACON N (48025) -> BEACON N (48023) CKT 1		100.4 %	108.3 %
BEACON S (48031) -> BEACON S (48029) CKT 1			105.6 %
ROSSPARK (48371) -> THIRHACH (48431) CKT 1		101.6 %	113.5 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	118.1 %	126.1 %	143.6 %
S-1: Airway Heights 115kV Switched Shunt + N-1: Airway Heights - Garden Springs 115 kV			
AIRWAYHT (48009)	0.925	0.9159	0.905
FAIRCHLD (40397)	0.9237	0.9144	0.9034
SILVRLK2 (48388)	0.9204	0.911	0.8996
W.PLAINS (47513)	0.9284	0.9194	0.909
S-1: Sunset 115kV Switched Shunt + N-1: Garden Springs - Westside 115 kV			
WEST (48461) -> FTWRIGHT (48129) CKT 1			100.2 %

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
P7			
N-2 (STR): Bell - Coulee #3 230 kV & Bell - Westside 230 kV			
WEST (48463)			0.9992
N-2 (STR): Bell - Westside 230 kV & Coulee - Westside 230 kV			
WEST (48463)			0.9801
/,P2			
BF: A689 Ninth & Central South 115 kV, Ninth & Central-Opportunity			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			102.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1			108.2 %

Light Scenario Assessment Results

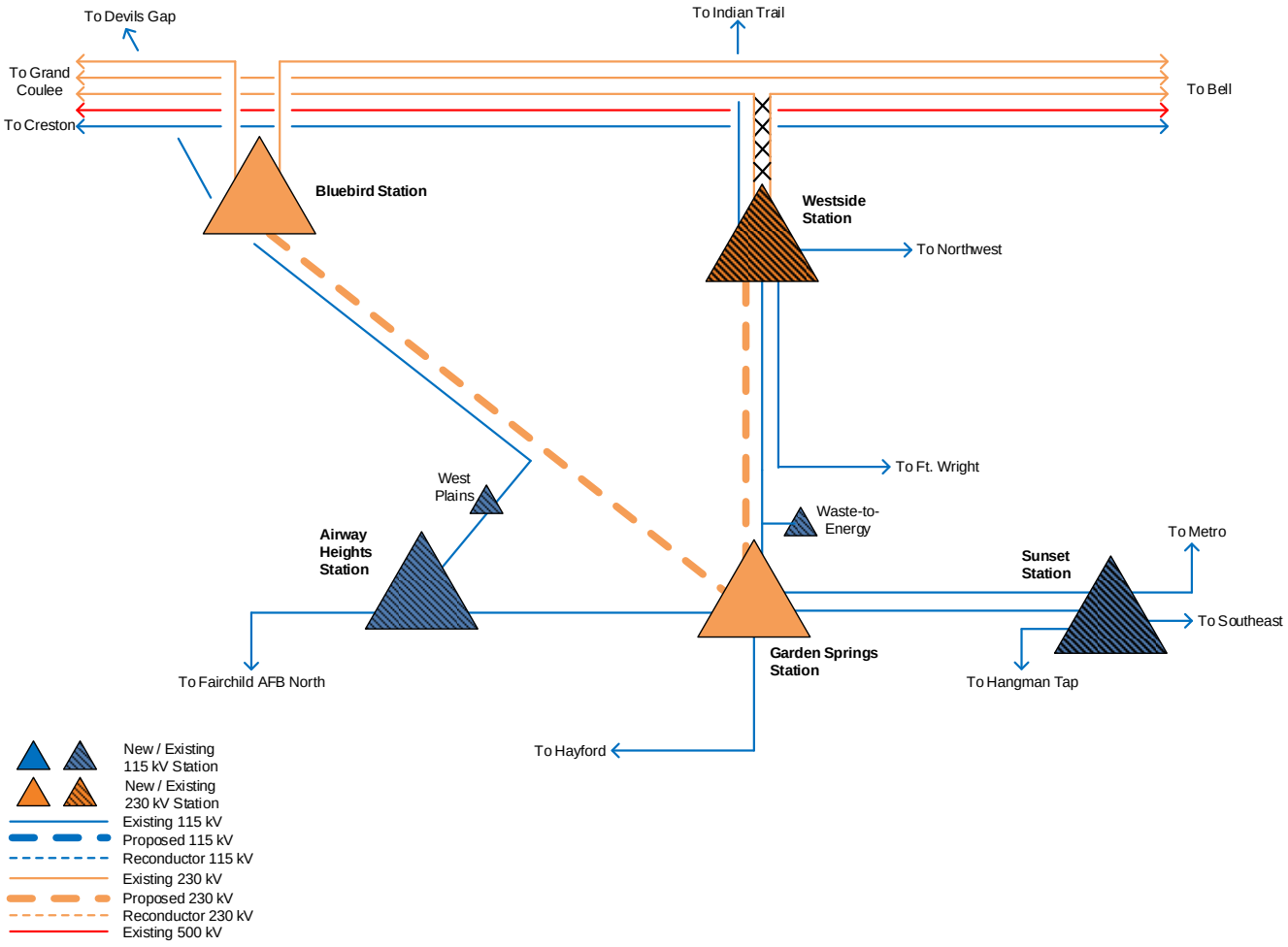
No potential violations were identified

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Garden Springs Integration Project Feasibility Study
- West Spokane Transmission Plan
- West Plains Reinforcement Plan

Project Diagram



Nine Mile – Westside Protection Upgrade

Project Scope/Description

Implementation of a high speed, communication aided tripping scheme on the Nine Mile – Westside 115 kV Transmission Line is necessary to improve stability performance of the Nine Mile units. A new communication path is required between Nine Mile and Westside Stations. Upgrades and setting changes to relays at each station are also required to implement Avista's standard permissive overreaching transfer trip scheme.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in requirement R4.1.1 of TPL-001-4 in scenarios representing 2016 heavy summer.

System performance following the completion of the Nine Mile generator rebuild project has not been assessed.

Performance Criteria Violations

Row Labels	16LS Max of Voltage Dip or Frequency	16LS Max of Duration or Time	16LW Max of Voltage Dip or Frequency	16LW Max of Duration or Time	20LSPROJECTS Max of Voltage Dip or Frequency	20LSPROJECTS Max of Duration or Time	20LWPROJECTS Max of Voltage Dip or Frequency	20LWPROJECTS Max of Duration or Time
P7								
N-2: Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV 2LG								
Out of Step Generator								
NINEMI34 14kV	OOS	1.5 s	OOS	1.5 s			OOS	1.5 s
N-2: Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV 3P								
Out of Step Generator								
NINEMI34 14kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s

Bell Thermal Relays with Long Term plans to Reconductor various 115 kV lines

Project Scope/Description

The BPA Bell Station presently consists of a single 250 MVA 230/115 kV transformer. During outages of the transformer, the transmission system is susceptible to local voltage collapse for subsequent outages between Beacon and Bell stations. The 2015 Avista Planning Assessment identified thermal capacity issues for multiple contingency scenarios within this area. In this year's assessment it was identified if the system were to suffer the loss of the Beacon – Bell No.1, Beacon – Northeast, or Bell – Northeast 115 kV Transmission Lines, in conjunction with the BPA owned Bell 230/115 kV Transformer for a Category P6 contingency there may be very large overloads on the remaining line(s). There are several potential solutions to this issue. More discussion is needed with BPA to finalize plans.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing all 2015 conditions studied.

Performance Criteria Violations

Heavy Summer Assessment Results

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
P6			
N-1: Beacon - Bell #1 115 kV + T-1: Bell #6 230/115 kV			
BEACON N (48023) -> NORTHEAS (48277) CKT 1	131.4 %	133.2 %	137.4 %
NORTHEAS (48277) -> WAIKIKIT (48449) CKT 1	102.2 %	102.8 %	104.2 %
N-1: Beacon - Northeast 115 kV + T-1: Bell #6 230/115 kV			
BEACON S (48029) -> BELL BPA (40087) CKT 1	168.9 %	171.3 %	176.8 %
N-1: Bell - Northeast 115 kV + T-1: Bell #6 230/115 kV			
BEACON S (48029) -> BELL BPA (40087) CKT 1	107.7 %	107.0 %	106.0 %

Heavy Winter Assessment Results

Row Labels	20HWPROJECTS	25HWPROJECTS	35HWPROJECTS
P6			
N-1: Beacon - Bell #1 115 kV + T-1: Bell #6 230/115 kV			
BEACON N (48023) -> NORTHEAS (48277) CKT 1	119.6 %	120.7 %	123.4 %
NORTHEAS (48277) -> WAIKIKIT (48449) CKT 1			100.7 %
N-1: Beacon - Northeast 115 kV + T-1: Bell #6 230/115 kV			
BEACON S (48029) -> BELL BPA (40087) CKT 1	155.5 %	157.0 %	160.6 %
N-1: Bell - Northeast 115 kV + T-1: Bell #6 230/115 kV			
BEACON S (48029) -> BELL BPA (40087) CKT 1	115.4 %	115.4 %	115.7 %

Heavy Summer Low Hydro Assessment Results

Row Labels	20HSPROJECTSLH	25HSPROJECTSLH	35HSPROJECTSLH
P6			
N-1: Beacon - Bell #1 115 kV + T-1: Bell #6 230/115 kV			
BEACON N (48023) -> NORTHEAS (48277) CKT 1	127.0 %	129.2 %	133.8 %
NORTHEAS (48277) -> WAIKIKIT (48449) CKT 1			100.5 %
N-1: Beacon - Northeast 115 kV + T-1: Bell #6 230/115 kV			
BEACON S (48029) -> BELL BPA (40087) CKT 1	163.4 %	166.1 %	172.3 %
N-1: Bell - Northeast 115 kV + T-1: Bell #6 230/115 kV			
BEACON S (48029) -> BELL BPA (40087) CKT 1	101.8 %	101.5 %	100.6 %

Light Scenario Assessment Results

Row Labels	20LSPROJECTS	20LWPROJECTS
P6		
N-1: Beacon - Northeast 115 kV + T-1: Bell #6 230/115 kV		
BEACON S (48029) -> BELL BPA (40087) CKT 1	104.7 %	104.9 %

Study Report Reference(s)

Further details related to the project can be referenced in the following documents:

- Central Spokane Study Report

Ninth & Central 230 kV Integration

Project Scope/Description

An addition of 230 kV facilities at Ninth & Central Station has been proposed to reduce the dependence on Beacon Station. The scope of the project includes the installation of two 250 MVA 230/115 kV autotransformers, a 230 kV bus configured as double bus, double breaker with provisions for three transmission line terminals, and the construction of two 230 kV transmission lines from the north into the station. Looping either Beacon – Bell #4 or #5 230 kV transmission line into Ninth & Central Station is the preferred transmission integration. The ability to convert either of the existing Beacon – Ninth & Central #1 and #2 115 kV transmission lines to 230 kV is under evaluation.

Bus outages and tie breaker failures at Beacon Station cause the applicable facility ratings to be exceeded on area 115 kV transmission lines and the Westside #1 & #2 230/115 kV transformers. The most severe outage is the 115 kV bus tie breaker failure causing the Northwest – Westside and Ninth & Central – Otis Orchards 115 kV transmission lines to exceed their applicable facility ratings (see Figure III-14).

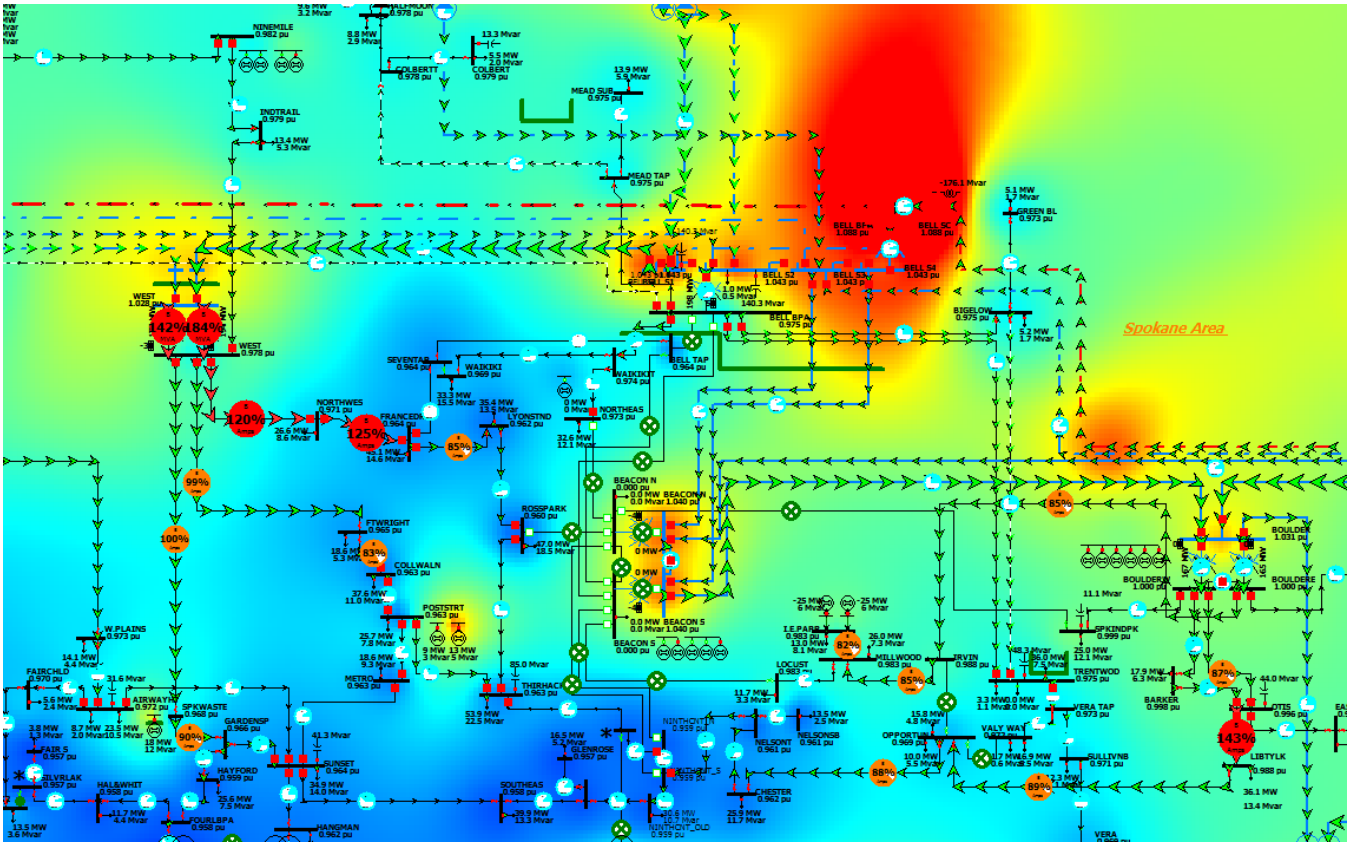


FIGURE III-14: BEACON 115 KV TBF IN 25HS

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing 2016 heavy summer.

Performance Criteria Violations

Heavy Summer Assessment Results

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
NA			
RES: N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV			
BEACON N (48023) -> ROSSPARK (48371) CKT 1			100.1 %
BEACON N (48025) -> BEACON N (48023) CKT 1			106.6 %
P1			
T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			100.3 %
P2			
BF: A600 Beacon North & South 115 kV			
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	115.3 %	121.6 %	135.3 %
WEST (48461) -> NORTHWES (48279) CKT 1	110.6 %	116.5 %	129.2 %
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	107.1 %	110.8 %	118.2 %
BF: R427 Beacon North & South 230 kV			
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1	104.2 %	110.6 %	125.7 %
WEST (48461) -> SPKWASTE (48409) CKT 1			107.1 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	103.4 %	108.8 %	119.1 %
WEST (48461) -> NORTHWES (48279) CKT 1	101.2 %	106.4 %	116.4 %

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
BUS: Beacon North 115 kV			
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2			104.3 %
BUS: Beacon South 230 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.3 %
P5			
PSF: Beacon North 115 kV			
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2			104.3 %
P6			
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			101.6 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			103.8 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Bell #6 230/115 kV			
BEACON S (48029) -> BELL BPA (40087) CKT 1			100.6 %
N-1: Airway Heights - Devils Gap 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			106.3 %
N-1: Airway Heights - Devils Gap 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.1 %
WEST (48461) -> SPKWASTE (48409) CKT 1			106.2 %
N-1: Beacon - Bell #1 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.2 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Bell #5 230 kV			
BEACON N (48025)	1.009	1.0079	1.0082
BEACON S (48031)	1.0091	1.0079	1.0082
N-1: Beacon - Boulder 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		100.3 %	105.0 %
N-1: Beacon - Boulder 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		102.5 %	107.4 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Ross Park - Third & Hatch 115 kV			
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2			102.5 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Ross Park - Third & Hatch 115 kV			
BEACON N (48023) -> NINTHCNT_S (48272) CKT 1			100.4 %
N-1: Beacon - Northeast 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.5 %
N-1: Bell - Northeast 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			104.7 %
N-1: Bell - Northeast 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		101.3 %	107.0 %
N-1: Bell - Westside 230 kV + N-1: Beacon - Ross Park 115 kV			
LATAH_TAP (48182) -> THIRHACH (48431) CKT 1		100.4 %	114.6 %
N-1: Bell - Westside 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	107.3 %	111.8 %	119.6 %
N-1: Bell - Westside 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	109.6 %	114.3 %	122.3 %
N-1: Bell - Westside 230 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			109.0 %
BEACON S (48031) -> BEACON S (48029) CKT 1			106.4 %
N-1: Benewah - Pine Creek 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.3 %
N-1: Boulder - Lancaster 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			103.9 %
N-1: Boulder - Lancaster 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		101.9 %	106.4 %
N-1: Boulder #1 230/115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		100.6 %	105.4 %
N-1: Boulder #1 230/115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		102.8 %	107.7 %
N-1: Boulder #2 230/115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		100.5 %	105.2 %
N-1: Boulder #2 230/115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		102.7 %	107.5 %
N-1: College & Walnut - Westside 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			105.3 %
N-1: College & Walnut - Westside 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.2 %
WEST (48461) -> SPKWASTE (48409) CKT 1			105.2 %

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
N-1: Coulee - Westside 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			100.5 %
N-1: Coulee - Westside 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.7 %
N-1: Dworshak - Hatwai 500 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			100.4 %
N-1: Dworshak - Hatwai 500 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.7 %
N-1: Dworshak - Taft 500 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			100.3 %
N-1: Dworshak - Taft 500 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.6 %
N-1: Francis & Cedar - Northwest 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		100.1 %	105.0 %
WEST (48461) -> SPKWASTE (48409) CKT 1			103.9 %
N-1: Francis & Cedar - Northwest 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		102.3 %	107.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1			103.8 %
N-1: Francis & Cedar - Northwest 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			104.3 %
N-1: Metro - Post Street 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.1 %
N-1: Metro - Post Street 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.1 %
N-1: Metro - Post Street 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.6 %
N-1: Northwest - Westside 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		102.3 %	107.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1			110.2 %
N-1: Northwest - Westside 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	101.0 %	104.6 %	109.8 %
WEST (48461) -> SPKWASTE (48409) CKT 1			110.0 %
N-1: Northwest - Westside 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			110.4 %
S-1: Sunset 115kV Switched Shunt + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.5 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			101.1 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			103.3 %
S-1: Trentwood 115kV Switched Shunt + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.6 %
T-1: Beacon #1 230/115 kV + N-1: Boulder - Irvin #1 115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			100.8 %
T-1: Beacon #1 230/115 kV + N-1: Boulder - Irvin #2 115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			100.2 %
T-1: Beacon #1 230/115 kV + N-1: Garden Springs - Westside 115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			104.3 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			101.9 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			101.5 %
WEST (48461) -> NORTHWES (48279) CKT 1			101.9 %
T-1: Beacon #1 230/115 kV + N-1: WESTSIDE #3 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		100.2 %	105.7 %
T-1: Beacon #1 230/115 kV + N-1: WESTSIDE #4 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		100.2 %	105.7 %
T-1: Beacon #1 230/115 kV + T-1: Beacon #2 230/115 kV			
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1		101.7 %	115.6 %
WEST (48461) -> SPKWASTE (48409) CKT 1			102.1 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1		101.5 %	111.1 %
WEST (48461) -> NORTHWES (48279) CKT 1		100.6 %	109.9 %
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	103.6 %	106.9 %	111.7 %
T-1: Beacon #1 230/115 kV + T-1: Bell #6 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	117.5 %	121.7 %	130.3 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			100.2 %
WEST (48461) -> NORTHWES (48279) CKT 1			100.6 %
T-1: Beacon #1 230/115 kV + T-1: Boulder #1 230/115 kV			

Row Labels	20HSPROJECTS	25HSPROJECTS	35HSPROJECTS
BEACON S (48031) -> BEACON S (48029) CKT 1		102.0 %	106.8 %
T-1: Beacon #1 230/115 kV + T-1: Boulder #2 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		100.5 %	105.2 %
T-1: Beacon #2 230/115 kV + N-1: Boulder - Irvin #1 115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			103.0 %
T-1: Beacon #2 230/115 kV + N-1: Boulder - Irvin #2 115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.5 %
T-1: Beacon #2 230/115 kV + N-1: Garden Springs - Westside 115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		101.6 %	106.6 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			101.7 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			101.4 %
WEST (48461) -> NORTHWES (48279) CKT 1			101.8 %
T-1: Beacon #2 230/115 kV + N-1: WESTSIDE #3 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		102.4 %	108.1 %
T-1: Beacon #2 230/115 kV + N-1: WESTSIDE #4 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		102.4 %	108.1 %
T-1: Beacon #2 230/115 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	120.1 %	124.4 %	133.1 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			100.1 %
WEST (48461) -> NORTHWES (48279) CKT 1			100.6 %
T-1: Beacon #2 230/115 kV + T-1: Boulder #1 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.9 %	104.3 %	109.2 %
T-1: Beacon #2 230/115 kV + T-1: Boulder #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		102.7 %	107.5 %
T-1: Bell #6 230/115 kV + N-1: Garden Springs - Westside 115 kV			
WEST (48461) -> FTWRIGHT (48129) CKT 1			102.2 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			101.4 %
WEST (48461) -> NORTHWES (48279) CKT 1			101.4 %
T-1: Hatwai 500/230 kV + N-1: Northwest - Westside 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			103.4 %
T-1: Hatwai 500/230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.8 %
P7			
N-2 (STR): Bell - Westside 230 kV & Coulee - Westside 230 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			107.3 %
SSEE			
N-2 (ROW and ADJ): College & Walnut - Westside 115 kV and Sunset - Westside 115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			110.8 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1		105.0 %	118.2 %
WEST (48461) -> NORTHWES (48279) CKT 1		102.3 %	114.9 %
N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1			106.6 %
N-2: College & Walnut - Westside 115 kV and Garden Springs - Westside 115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1		102.1 %	119.1 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	101.4 %	107.1 %	120.5 %
WEST (48461) -> NORTHWES (48279) CKT 1		104.0 %	116.8 %
SUB: Beacon 230 & 115 (AVA)			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			112.0 %
WEST (48461) -> FTWRIGHT (48129) CKT 1		103.4 %	116.3 %
WEST (48461) -> SPKWASTE (48409) CKT 1	104.3 %	111.8 %	128.3 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	121.6 %	128.4 %	142.9 %
WEST (48461) -> NORTHWES (48279) CKT 1	115.7 %	122.0 %	135.4 %
BOULDERW (48520) -> SPKINDPK (48405) CKT 1		101.9 %	107.9 %

Heavy Winter Assessment Results

Row Labels	20HWPROJECTS	25HWPROJECTS	35HWPROJECTS
NA			
RES: N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV			
BEACON N (48023) -> ROSSPARK (48371) CKT 1			101.5 %

Row Labels	20HWPROJECTS	25HWPROJECTS	35HWPROJECTS
P2			
BF: A600 Beacon North & South 115 kV			
WEST (48461) -> NORTHWES (48279) CKT 1	105.2 %	111.4 %	121.0 %
BF: A717 Boulder East & West 115 kV			
BECKROAD (48118)			0.9456
DOWER RD (47033)		0.9446	0.9362
DOWERRDT (48111)		0.9486	0.9403
EASTFARM (48117)			0.9475
MOAB (47511)		0.9476	0.9391
PLEASANT (48319)		0.948	0.9396
POST FLS (48329)		0.9496	0.9412
BF: R427 Beacon North & South 230 kV			
WEST (48461) -> NORTHWES (48279) CKT 1		102.1 %	108.6 %
P6			
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Bell #5 230 kV			
BEACON N (48025)		1.0097	1.0062
BEACON S (48031)		1.0097	1.0062
N-1: Beacon - Boulder 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			100.6 %
N-1: Bell - Westside 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			102.9 %
N-1: Bell - Westside 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		107.5 %	115.8 %
N-1: Bell - Westside 230 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		100.1 %	107.5 %
N-1: Boulder #1 230/115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.1 %
N-1: Boulder #2 230/115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.9 %
N-1: Francis & Cedar - Northwest 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			100.0 %
N-1: Metro - Post Street 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.9 %
N-1: Northwest - Westside 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.7 %
N-1: Northwest - Westside 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.6 %
T-1: Beacon #1 230/115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> NORTHWES (48279) CKT 1			100.9 %
T-1: Beacon #1 230/115 kV + T-1: Bell #6 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	102.6 %	108.0 %	115.6 %
T-1: Beacon #2 230/115 kV + N-1: WESTSIDE #3 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.6 %
T-1: Beacon #2 230/115 kV + N-1: WESTSIDE #4 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.6 %
T-1: Beacon #2 230/115 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	114.2 %	121.5 %	130.0 %
T-1: Beacon #2 230/115 kV + T-1: Boulder #1 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.7 %
T-1: Beacon #2 230/115 kV + T-1: Boulder #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.9 %
SSEE			
N-2 (ROW and ADJ): College & Walnut - Westside 115 kV and Sunset - Westside 115 kV			
WEST (48461) -> NORTHWES (48279) CKT 1		104.4 %	112.4 %
N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV			
BEACON N (48023) -> ROSSPARK (48371) CKT 1			101.4 %
N-2: College & Walnut - Westside 115 kV and Garden Springs - Westside 115 kV			
WEST (48461) -> NORTHWES (48279) CKT 1		105.4 %	113.5 %
SUB: Beacon 230 & 115 (AVA)			
WEST (48461) -> SPKWASTE (48409) CKT 1		104.6 %	117.0 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			100.9 %
WEST (48461) -> NORTHWES (48279) CKT 1	111.4 %	117.7 %	128.0 %

Heavy Summer Low Hydro Assessment Results

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
NA			
RES: N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV			
BEACON N (48023) -> ROSSPARK (48371) CKT 1		103.3 %	114.9 %
BEACON N (48025) -> BEACON N (48023) CKT 1			114.9 %
BEACON S (48031) -> BEACON S (48029) CKT 1			107.7 %
ROSSPARK (48371) -> THIRHACH (48431) CKT 1		101.2 %	112.1 %
P1			
T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		101.0 %	104.8 %
T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		103.3 %	107.1 %
P2			
BF: A600 Beacon North & South 115 kV			
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	122.2 %	128.8 %	142.4 %
WEST (48461) -> NORTHWES (48279) CKT 1	116.2 %	122.4 %	135.0 %
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	113.0 %	117.6 %	124.5 %
BF: A717 Boulder East & West 115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.6 %
BEACON S (48031) -> BEACON S (48029) CKT 1			100.5 %
BF: R427 Beacon North & South 230 kV			
BELL BPA (40087) -> BEACON S (48029) CKT 1			111.7 %
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1	119.9 %	127.2 %	141.5 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			107.9 %
WAIKIKIT (48449) -> NORTHEAS (48277) CKT 1			110.2 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			102.2 %
WEST (48461) -> SPKWASTE (48409) CKT 1	103.3 %	109.5 %	122.8 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	106.5 %	111.1 %	122.1 %
WEST (48461) -> NORTHWES (48279) CKT 1	103.8 %	108.4 %	118.9 %
BUS: Beacon North 115 kV			
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2	101.3 %	107.3 %	117.9 %
BUS: Beacon South 115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			103.5 %
BUS: Beacon South 230 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.8 %	104.7 %	108.6 %
BUS: Westside 230 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1		100.1 %	108.0 %
BEACON S (48031) -> BEACON S (48029) CKT 1			105.3 %
P5			
PSF: Beacon North 115 kV			
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2	101.3 %	107.3 %	117.9 %
PSF: Beacon South 115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.6 %
P6			
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	100.4 %	104.4 %	108.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1			100.3 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	102.6 %	106.7 %	110.8 %
WEST (48461) -> SPKWASTE (48409) CKT 1			100.2 %
N-1: 3TM Bell - Boundary #3 230 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.1 %
WEST (48461) -> SPKWASTE (48409) CKT 1			101.7 %
N-1: Airway Heights - Devils Gap 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			105.1 %
N-1: Airway Heights - Devils Gap 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			105.0 %
N-1: Beacon - Bell #1 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		102.8 %	107.4 %
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1			100.4 %
N-1: Beacon - Bell #1 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	101.0 %	105.2 %	109.9 %
N-1: Beacon - Bell #4 230 kV + N-1: Beacon - Bell #5 230 kV			
BEACON N (48025)		1.0078	1.0089

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
BEACON S (48031)		1.0078	1.0089
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1		103.3 %	116.3 %
WEST (48461) -> SPKWASTE (48409) CKT 1			111.8 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			100.2 %
WEST (48461) -> NORTHWES (48279) CKT 1			100.8 %
N-1: Beacon - Bell #4 230 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			103.5 %
N-1: Beacon - Bell #5 230 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			103.8 %
N-1: Beacon - Boulder 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	105.3 %	109.4 %	113.7 %
N-1: Beacon - Boulder 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	107.6 %	111.8 %	116.2 %
N-1: Beacon - Boulder 230 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.8 %
N-1: Beacon - Ninth & Central #1 115 kV + N-1: Ross Park - Third & Hatch 115 kV			
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2	100.9 %	106.7 %	117.8 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.5 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.6 %
N-1: Beacon - Ninth & Central #1 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.2 %
N-1: Beacon - Ninth & Central #2 115 kV + N-1: Ross Park - Third & Hatch 115 kV			
BEACON N (48023) -> NINTHCNT_S (48272) CKT 1		104.5 %	115.3 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.5 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.3 %
N-1: Beacon - Ninth & Central #2 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.1 %
N-1: Beacon - Northeast 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		102.4 %	107.0 %
N-1: Beacon - Northeast 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.4 %	104.5 %	109.3 %
N-1: Bell - Creston 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		102.3 %	106.2 %
N-1: Bell - Creston 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.6 %	104.6 %	108.6 %
N-1: Bell - Northeast 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	103.1 %	107.4 %	112.4 %
BELL BPA (40087) -> BEACON S (48029) CKT 1			100.4 %
N-1: Bell - Northeast 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	105.3 %	109.7 %	114.8 %
BELL BPA (40087) -> BEACON S (48029) CKT 1			100.6 %
N-1: Bell - Westside 230 kV + N-1: Beacon - Ross Park 115 kV			
BEACON N (48023) -> NINTHCNT_S (48272) CKT 1			109.3 %
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2			109.2 %
BELL TAP (48033) -> SEVENTAP (48381) CKT 1			108.2 %
LATAH_TAP (48182) -> THIRHACH (48431) CKT 1	110.8 %	117.8 %	132.7 %
NINTHCNT_N (48271) -> LATAH_TAP (48182) CKT 1			106.2 %
N-1: Bell - Westside 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	115.8 %	120.9 %	129.0 %
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1			105.3 %
N-1: Bell - Westside 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	118.4 %	123.5 %	131.9 %
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1			104.1 %
N-1: Bell - Westside 230 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	103.5 %	108.0 %	117.4 %
BEACON S (48031) -> BEACON S (48029) CKT 1	101.1 %	105.4 %	114.7 %
N-1: Benewah - Pine Creek 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.1 %		
N-1: Boulder - Lancaster 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	102.1 %	106.0 %	109.9 %

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
WEST (48461) -> SPKWASTE (48409) CKT 1			101.0 %
N-1: Boulder - Lancaster 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	104.5 %	108.5 %	112.5 %
WEST (48461) -> SPKWASTE (48409) CKT 1			100.9 %
N-1: Boulder - Lancaster 230 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			101.7 %
WEST (48461) -> SPKWASTE (48409) CKT 1			101.8 %
N-1: Boulder #1 230/115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	103.9 %	108.1 %	112.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1			100.0 %
N-1: Boulder #1 230/115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	106.2 %	110.5 %	114.9 %
N-1: Boulder #1 230/115 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.2 %
WEST (48461) -> SPKWASTE (48409) CKT 1			100.2 %
N-1: Boulder #2 230/115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	103.8 %	108.0 %	112.3 %
N-1: Boulder #2 230/115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	106.1 %	110.3 %	114.7 %
N-1: Boulder #2 230/115 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.1 %
WEST (48461) -> SPKWASTE (48409) CKT 1			100.2 %
N-1: Boulder #2 230/115 kV + T-1: Boulder #1 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.3 %
BEACON S (48031) -> BEACON S (48029) CKT 1			100.2 %
WEST (48461) -> SPKWASTE (48409) CKT 1			100.6 %
N-1: College & Walnut - Post Street 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1			106.0 %
WEST (48461) -> SPKWASTE (48409) CKT 1			104.8 %
N-1: College & Walnut - Post Street 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.2 %		108.3 %
WEST (48461) -> SPKWASTE (48409) CKT 1			104.6 %
N-1: College & Walnut - Post Street 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			105.7 %
N-1: College & Walnut - Westside 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		102.8 %	106.9 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			104.3 %
WEST (48461) -> SPKWASTE (48409) CKT 1		105.7 %	119.2 %
N-1: College & Walnut - Westside 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	101.1 %	105.1 %	109.3 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			104.2 %
WEST (48461) -> SPKWASTE (48409) CKT 1		105.5 %	119.0 %
N-1: Coulee - Westside 230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	100.2 %	104.2 %	108.5 %
N-1: Coulee - Westside 230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	102.4 %	106.5 %	110.9 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.7 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.6 %
N-1: Devils Gap - Nine Mile 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			102.7 %
N-1: Dworshak - Hatwai 500 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		103.0 %	106.8 %
N-1: Dworshak - Hatwai 500 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	101.4 %	105.3 %	109.2 %
N-1: Dworshak - Taft 500 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		102.9 %	106.7 %
N-1: Dworshak - Taft 500 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	101.3 %	105.2 %	109.1 %
N-1: Francis & Cedar - Northwest 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	102.9 %	106.9 %	111.5 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			101.5 %
WEST (48461) -> SPKWASTE (48409) CKT 1		102.2 %	115.5 %
N-1: Francis & Cedar - Northwest 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	105.1 %	109.3 %	114.0 %

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			101.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1		102.1 %	115.4 %
N-1: Francis & Cedar - Northwest 115 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.0 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			101.7 %
WEST (48461) -> SPKWASTE (48409) CKT 1		102.9 %	116.0 %
N-1: Francis & Cedar - Ross Park 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.9 %
N-1: Francis & Cedar - Ross Park 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.7 %
N-1: Francis & Cedar - Ross Park 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.6 %
N-1: Metro - Post Street 115 kV + T-1: Beacon #1 230/115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			102.8 %
WEST (48461) -> SPKWASTE (48409) CKT 1		102.8 %	117.1 %
N-1: Metro - Post Street 115 kV + T-1: Beacon #2 230/115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			102.8 %
WEST (48461) -> SPKWASTE (48409) CKT 1		102.8 %	117.0 %
N-1: Metro - Post Street 115 kV + T-1: Bell #6 230/115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			103.0 %
WEST (48461) -> SPKWASTE (48409) CKT 1		103.2 %	117.5 %
N-1: Metro - Sunset 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			109.5 %
N-1: Metro - Sunset 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			109.5 %
N-1: Metro - Sunset 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			110.1 %
N-1: Nine Mile - Westside 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.1 %
N-1: Nine Mile - Westside 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			101.1 %
N-1: Nine Mile - Westside 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			102.1 %
N-1: Ninth & Central - Sunset 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.3 %
N-1: Ninth & Central - Sunset 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.2 %
N-1: Ninth & Central - Sunset 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			100.9 %
N-1: Northwest - Westside 115 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	105.0 %	109.1 %	113.9 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			106.3 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			102.3 %
WEST (48461) -> SPKWASTE (48409) CKT 1	102.0 %	107.8 %	121.8 %
N-1: Northwest - Westside 115 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	107.3 %	111.5 %	116.4 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			106.2 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			102.1 %
WEST (48461) -> SPKWASTE (48409) CKT 1	101.9 %	107.7 %	121.6 %
N-1: Northwest - Westside 115 kV + T-1: Bell #6 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			104.0 %
BEACON S (48031) -> BEACON S (48029) CKT 1			101.6 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			106.4 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			102.3 %
WEST (48461) -> SPKWASTE (48409) CKT 1	102.7 %	108.3 %	122.1 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			104.6 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			104.5 %
N-1: Post Street - Third & Hatch 115 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			104.9 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Beacon #1 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			104.9 %
N-1: Ross Park - Third & Hatch 115 kV + T-1: Beacon #2 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			104.9 %
S-1: Airway Heights 115kV Switched Shunt + T-1: Beacon #1 230/115 kV			

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
BEACON S (48031) -> BEACON S (48029) CKT 1		102.1 %	
S-1: Airway Heights 115kV Switched Shunt + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.4 %	104.4 %	
S-1: Otis Orchards 115kV Switched Shunt + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		102.1 %	
S-1: Otis Orchards 115kV Switched Shunt + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.4 %	104.4 %	
S-1: Sunset 115kV Switched Shunt + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		102.6 %	106.1 %
S-1: Sunset 115kV Switched Shunt + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.9 %	104.8 %	108.5 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	100.7 %	104.6 %	107.9 %
S-1: Third & Hatch 115kV Switched Shunt + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	102.9 %	106.9 %	110.3 %
S-1: Trentwood 115kV Switched Shunt + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		102.6 %	106.2 %
S-1: Trentwood 115kV Switched Shunt + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.9 %	104.8 %	108.5 %
T-1: Beacon #1 230/115 kV + N-1: Boulder - Irvin #1 115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		103.7 %	107.6 %
T-1: Beacon #1 230/115 kV + N-1: Boulder - Irvin #2 115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		103.2 %	107.0 %
T-1: Beacon #1 230/115 kV + N-1: Garden Springs - Westside 115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	103.2 %	107.4 %	111.9 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			111.0 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			102.7 %
WEST (48461) -> NORTHWES (48279) CKT 1			102.8 %
T-1: Beacon #1 230/115 kV + N-1: WESTSIDE #3 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	104.7 %	109.0 %	114.2 %
WEST (48463) -> WEST (48461) CKT 4			102.1 %
T-1: Beacon #1 230/115 kV + N-1: WESTSIDE #4 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	104.7 %	109.0 %	114.2 %
WEST (48463) -> WEST (48461) CKT 3			102.1 %
T-1: Beacon #1 230/115 kV + T-1: Beacon #2 230/115 kV			
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1	107.8 %	114.3 %	127.5 %
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			102.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1		103.1 %	115.9 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1		101.0 %	111.3 %
WEST (48461) -> NORTHWES (48279) CKT 1		100.2 %	110.2 %
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	107.1 %	111.3 %	115.6 %
T-1: Beacon #1 230/115 kV + T-1: Bell #6 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	126.5 %	131.7 %	139.7 %
WEST (48461) -> SPKWASTE (48409) CKT 1			110.8 %
WEST (48461) -> NORTHWES (48279) CKT 1			100.2 %
T-1: Beacon #1 230/115 kV + T-1: Boulder #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	105.3 %	109.5 %	113.9 %
WEST (48461) -> SPKWASTE (48409) CKT 1			101.0 %
T-1: Beacon #1 230/115 kV + T-1: Boulder #2 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1	103.8 %	108.0 %	112.3 %
T-1: Beacon #2 230/115 kV + N-1: Boulder - Irvin #1 115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	101.9 %	105.9 %	109.9 %
T-1: Beacon #2 230/115 kV + N-1: Boulder - Irvin #2 115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	101.4 %	105.5 %	109.4 %
T-1: Beacon #2 230/115 kV + N-1: Garden Springs - Westside 115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	105.5 %	109.7 %	114.4 %
WEST (48461) -> FTWRIGHT (48129) CKT 1			110.8 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			102.6 %
WEST (48461) -> NORTHWES (48279) CKT 1			102.7 %
T-1: Beacon #2 230/115 kV + N-1: WESTSIDE #3 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	107.0 %	111.4 %	116.7 %
WEST (48463) -> WEST (48461) CKT 4			102.0 %
T-1: Beacon #2 230/115 kV + N-1: WESTSIDE #4 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	107.0 %	111.4 %	116.7 %
WEST (48463) -> WEST (48461) CKT 3			102.0 %
T-1: Beacon #2 230/115 kV + T-1: Bell #6 230/115 kV			

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
BEACON N (48025) -> BEACON N (48023) CKT 1	129.2 %	134.5 %	142.7 %
WEST (48461) -> SPKWASTE (48409) CKT 1			110.7 %
WEST (48461) -> NORTHWES (48279) CKT 1			100.1 %
T-1: Beacon #2 230/115 kV + T-1: Boulder #1 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	107.6 %	111.9 %	116.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1			100.9 %
T-1: Beacon #2 230/115 kV + T-1: Boulder #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	106.1 %	110.3 %	114.7 %
T-1: Bell #6 230/115 kV + N-1: Garden Springs - Westside 115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.3 %
WEST (48461) -> FTWRIGHT (48129) CKT 1		100.1 %	111.3 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1			102.6 %
WEST (48461) -> NORTHWES (48279) CKT 1			102.4 %
T-1: Bell #6 230/115 kV + N-1: WESTSIDE #3 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			104.5 %
BEACON S (48031) -> BEACON S (48029) CKT 1			102.1 %
WEST (48463) -> WEST (48461) CKT 4			102.5 %
T-1: Bell #6 230/115 kV + N-1: WESTSIDE #4 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			104.5 %
BEACON S (48031) -> BEACON S (48029) CKT 1			102.1 %
WEST (48463) -> WEST (48461) CKT 3			102.5 %
T-1: Bell #6 230/115 kV + T-1: Boulder #1 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			103.5 %
BEACON S (48031) -> BEACON S (48029) CKT 1			101.2 %
WEST (48461) -> SPKWASTE (48409) CKT 1			101.1 %
T-1: Bell #6 230/115 kV + T-1: Boulder #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.1 %
WEST (48461) -> SPKWASTE (48409) CKT 1			100.2 %
T-1: Boulder #2 230/115 kV + T-1: Boulder #1 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1			102.3 %
BEACON S (48031) -> BEACON S (48029) CKT 1			100.2 %
WEST (48461) -> SPKWASTE (48409) CKT 1			100.6 %
T-1: Hatwai 500/230 kV + N-1: Metro - Sunset 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			106.8 %
T-1: Hatwai 500/230 kV + N-1: Northwest - Westside 115 kV			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1			100.9 %
WEST (48461) -> SPKWASTE (48409) CKT 1		101.6 %	114.8 %
T-1: Hatwai 500/230 kV + N-1: Post Street - Third & Hatch 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			102.0 %
T-1: Hatwai 500/230 kV + N-1: Ross Park - Third & Hatch 115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			102.2 %
T-1: Hatwai 500/230 kV + T-1: Beacon #1 230/115 kV			
BEACON S (48031) -> BEACON S (48029) CKT 1		102.6 %	106.4 %
WEST (48461) -> SPKWASTE (48409) CKT 1			101.5 %
T-1: Hatwai 500/230 kV + T-1: Beacon #2 230/115 kV			
BEACON N (48025) -> BEACON N (48023) CKT 1	100.9 %	104.9 %	108.9 %
WEST (48461) -> SPKWASTE (48409) CKT 1			101.4 %
T-1: Hatwai 500/230 kV + T-1: Bell #6 230/115 kV			
WEST (48461) -> SPKWASTE (48409) CKT 1			102.6 %
P7			
N-2 (STR): Bell - Westside 230 kV & Coulee - Westside 230 kV			
BEACON N (48023) -> ROSSPARK (48371) CKT 1		103.8 %	116.5 %
BEACON N (48025) -> BEACON N (48023) CKT 1		100.1 %	108.0 %
BEACON S (48031) -> BEACON S (48029) CKT 1			105.3 %
ROSSPARK (48371) -> THIRHACH (48431) CKT 1		101.6 %	113.5 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	118.0 %	126.1 %	143.6 %
SSEE			
N-2 (ROW and ADJ): College & Walnut - Westside 115 kV and Sunset - Westside 115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	113.4 %	121.1 %	137.7 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	102.8 %	107.6 %	121.4 %
WEST (48461) -> NORTHWES (48279) CKT 1		104.2 %	117.5 %
N-2 (ROW): Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV			
BEACON N (48023) -> ROSSPARK (48371) CKT 1		102.1 %	114.5 %
BEACON N (48025) -> BEACON N (48023) CKT 1			106.8 %

Row Labels	20HSPROJECT SLH	25HSPROJECT SLH	35HSPROJECT SLH
BEACON S (48031) -> BEACON S (48029) CKT 1			104.1 %
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	114.8 %	122.5 %	139.7 %
N-2: College & Walnut - Westside 115 kV and Garden Springs - Westside 115 kV			
THIRHACH (48431) -> POSTSTRT (48339) CKT 1	121.6 %	129.5 %	146.5 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	105.1 %	110.0 %	123.9 %
WEST (48461) -> NORTHWES (48279) CKT 1	101.2 %	106.1 %	119.5 %
SUB: Beacon 230 & 115 (AVA)			
SPKWASTE (48409) -> GARDENSP (48131) CKT 1	109.1 %	115.2 %	128.1 %
WEST (48461) -> FTWRIGHT (48129) CKT 1	110.8 %	116.9 %	129.5 %
WEST (48461) -> SPKWASTE (48409) CKT 1	124.9 %	132.5 %	148.8 %
NORTHWES (48279) -> FRANCEDR (48127) CKT 1	131.2 %	138.2 %	152.6 %
WEST (48461) -> NORTHWES (48279) CKT 1	123.4 %	130.0 %	143.3 %
FTWRIGHT (48129) -> COLLWALN (48081) CKT 1		101.0 %	112.0 %
FRANCEDR (48127) -> LYONSTND (48219) CKT 1			109.5 %
WESTBPA1 (41275) -> WEST (48463) CKT 1			105.8 %
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	100.8 %	104.8 %	110.5 %
WEST (48463) -> WEST (48461) CKT 4			100.7 %
WEST (48463) -> WEST (48461) CKT 3			100.7 %
/,P2			
BF: A612 Beacon South 115 kV, Beacon-Irvin #2			
BEACON N (48025) -> BEACON N (48023) CKT 1			100.5 %

Light Scenario Assessment Results

No potential violations identified

7.3.4 Conceptual

Rathdrum – Westside 230 kV Transmission Line

Project Scope/Description

An outage of the Bell – Westside 230 kV Transmission Line leaves Westside Station as a comparatively weak 230 kV source to the Spokane area leaving the System susceptible to performance deficiencies during a second outage. The most notable outage combination is the Bell – Westside 230 kV Transmission Line and Beacon – Ross Park 115 kV Transmission Line. Other proposed projects will impact the System performance during the outage shown. For example, the proposed Ninth & Central 230 kV Integration will increase flows from Ninth & Central on the Ninth & Central – Third & Hatch 115 kV Transmission Line.

Constructing a new 230 kV transmission line from Rathdrum to Westside will improve the strength of Westside Station as a source to the Spokane area. Additional benefits are gained from the proposed transmission line including increased capacity from the Rathdrum area to the west. Increased capacity will improve the ability to reliability operate local generation.

Garden Springs – Ninth & Central 230 kV Transmission Line

Construction of a new Garden Springs – Ninth & Central 230 kV Transmission Line will add operational flexibility primarily for the operation of the proposed Garden Springs Station. Construction of 230 kV facilities at both Garden Springs and Ninth & Central need to be completed ahead of the Garden Springs – Ninth & Central 230 kV Transmission. How Garden

Springs and Ninth & Central is integrated into the system will impact the need and/or requirements of a Garden Springs – Ninth & Central 230 kV Transmission Line.

Silver Lake Switching Station

The area in the West Plains, including Airway Heights, the Spokane International Airport, and Fairchild Air Force Base, is served primarily by a long radial tap, South Fairchild Tap, and the Airway Height Station. Load growth in the West Plains is expected to be relatively high compared to other areas within Avista's service territory. As studied in the steady state contingency analysis, the transmission system in the area performs adequately as most of the load is lost through consequential load loss during contingency events. Further analysis is necessary to determine if the transmission system is providing adequate reliability and has sufficient operational flexibility.

The reconstruction of Silver Lake Station to include circuit breakers would allow the South Fairchild Tap to be operated normally closed to Airway Heights Station. The construction of Garden Springs Station is assumed to be completed. The additional breakers at Silver Lake will provide increased operational flexibility. Other alternatives need to be evaluated including the construction of a new transmission line in the area to provide redundancy during outages conditions.

Beacon Capacitor Bank

Voltage control within the Spokane area is limited to shunt capacitors located on 115 kV buses and LTC's on autotransformers. The 115 kV voltage can be maintained within its system operating limits. The 230 kV voltage will approach 230 kV during certain outages primarily related to loss of shunt capacitors at Bell Station. The installation of shunt capacitors at Beacon Station will improve the ability to maintain the 230 kV voltage in the area within 236 and 242 kV. Further analysis is necessary to determine the sizing, number of steps, and optimal location of the capacitors.

Beacon – Francis & Cedar 115 kV Transmission Line Reconductor

An outage of both the Francis & Cedar – Ross Park and Northwest – Westside 115 kV transmission lines leaves the Beacon – Francis & Cedar 115 kV Transmission Line serve Northwest and Francis & Cedar stations. The conductor on portion of the Beacon – Francis & Cedar 115 kV Transmission Line does not have adequate thermal capacity. Reconductor of the section between the Bell tap and Waikiki tap with 150 MVA capacity conductor will mitigate the observed thermal overloads. Further analysis is required to determine the impacts of other proposed projects including interconnecting the Beacon – Francis & Cedar 115 kV transmission line into Bell Station.

7.3.5 New Proposals

West Plain Reinforcement Project

A long term transmission system expansion plan has been developed for the West Plains area. The plan is intended to accommodate both the short term and long term needs of the transmission system. Load growth in the area requires the construction of new distribution stations and the associated transmission integration work. New transmission infrastructure is necessary to transfer power from the northern portion of Spokane area to the West Plains

area. The proposed Garden Springs Station integrated into the 230 kV transmission system was selected as the preferred project as it fits into the longer term plan to construct a 230 kV transmission loop around Spokane. Additional new stations in the West Plains area add operational flexibility and reduce the amount of load dropped for single points of failure on the system.

The West Plains Reinforcement Project includes the following steps:

- Garden Springs 230 kV and 115 kV Station with preferred 230 kV integration
- McFarland Station – new distribution station
- Flint Road Statoin – new distribution station
- Hallett & White Station – expand the existing station to accommodate load growth
- Melville Station – new switching station
- Airway Heights – Melville 115 kV Transmission Line – new line to integrate McFarland Station and connect north and south West Plains together
- Silver Lake Station – convert existing station to switching station
- Austin Station – new switching station at the Four Lakes tap
- Four Lakes Capacitor – install capacitor bank at Four Lakes Station
- Melville – Silver Lake 115 kV Transmission Line – rebuild existing line
- Austin – Sunset 115 kV Transmission Line – rebuild existing line

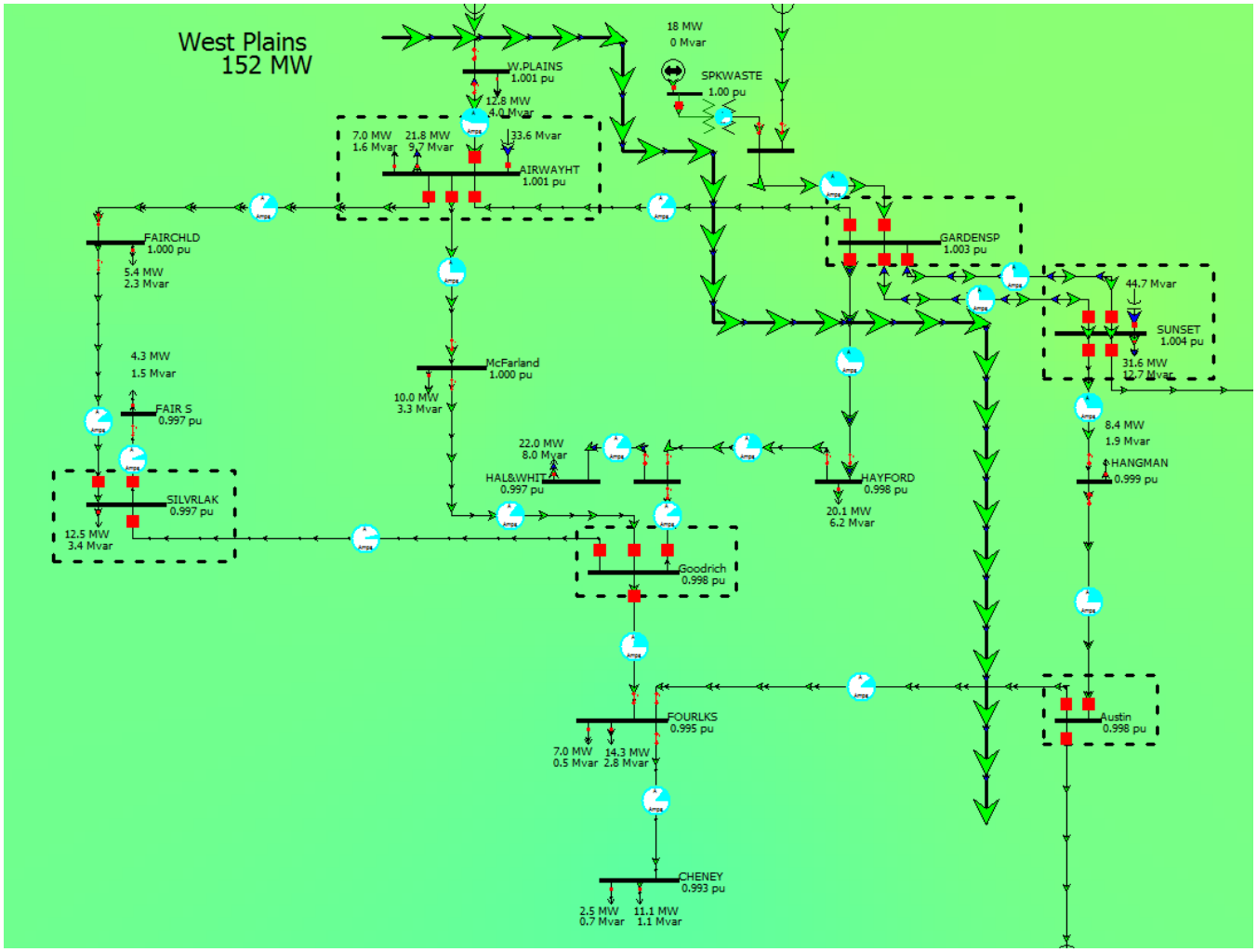


FIGURE 15: WEST PLAINS REINFOCEMENT PLAN

7.4 Single System Projects (non-corrective action plans)

7.4.1 Sunset Station Rebuild

A complete rebuild of Sunset Station is required. Sunset Station is a major station serving the south Spokane area and is reaching the end of its useful life. The oldest 115 kV circuit breaker on the system resides at Sunset Station. The AC and DC service power and control circuit problems make adding or replacing equipment very difficult and expensive. Increased capacity for transformer 2 and a new feeder will be required in the near future per Distribution Planning. It is not prudent to rebuild the operating station in place. The plan is to build a new station to current design and construction standards adjacent to the existing station on property Avista already owns.

7.4.2 Chester Station Rebuild

The Chester Station is planned to be rebuilt.

7.4.3 Metro Station Rebuild

The Metro Station is planned to be rebuilt to address a number of concerns related to existing condition of equipment in the station. Additional drivers of the project include the expansion of the Steam Plant facility located adjacent to the station. Due to the location of Metro Station in downtown Spokane, several conceptual alternatives have been discussed for relocation of the station.

The 115 kV transmission lines in the downtown Spokane area are underground cables. The cables are oil cooled and have exhibited leaks in the past. The Metro Station rebuild and potential relocation may facilitate an opportunity to replace the existing 115 kV cables.

7.4.4 Northwest Station Rebuild

The Northwest Station is planned to be rebuilt.

7.4.5 Hillyard Station

A new substation located in Hillyard (northeast portion of Spokane) has been identified by the Distribution Planning Department to provide relief to the distribution facilities of Beacon, Northeast, and Ross Park Stations. This substation will also support future development along the Spokane North-South Freeway corridor. The new substation is proposed to be interconnected to the transmission system by tapping and eventually looping in the Beacon – Bell #1 115 kV Transmission Line.

7.4.6 Downtown West Station

To relieve distribution capacity constraints west of the downtown Spokane area, it has been proposed by the Distribution Planning Department to construct a new substation located on the western edge of downtown. The new substation has temporarily been named Downtown West Station and would potentially be interconnected to the Metro – Sunset 115 kV Transmission Line. The addition of this substation will offload existing facilities at the College & Walnut Station and provide necessary backup capacity to the Sunset Station.

7.4.7 Hawthorne Station

A future station has been identified to support load growth and reliability for the potential development of the former Kaiser Mead property. The area surrounding the Kaiser Mead property has a large potential for load growth and the existing distribution facilities in the area will be inadequate to continue to feed the load. The new substation is proposed to be located adjacent to the old Kaiser facility which would allow for the ability to supply sufficient and reliable power to potential industrial customers as well as pick up additional load growth and offload existing facilities. The new substation has been named the Hawthorne Station. The desired interconnection to the transmission system has not been finalized at this time as there is potential to use the Hawthorne Station as a means of reinforcing the transmission system to the north of Spokane. An adequate interconnection option which would allow the Hawthorne Station to become energized is tapping the existing Beacon – Bell #1 115 kV Transmission Line.

7.4.8 Greenacres / Otis Orchards Stations

A new substation located in the southeast region of the Spokane Valley Area has been identified by the Distribution Planning Department to offload existing distribution facilities at Liberty Lake and Barker Rd. Stations. The construction of this substation, presently called Greenacres Station, has been selected as a means of deferring the addition of distribution facilities at Otis Orchards Station.

The existing Otis Orchards Station has also been identified as the preferred location for adding distribution 115/13.8 kV transformation to support Otis Orchards. Discussion and study results are provided in *Otis Orchards 115/13kV Project* written by Jill Ham in 2009.

7.4.9 Irvin Distribution

The addition of distribution facilities at the new Irvin Station will improve the backup capabilities for surrounding distribution stations. The initial project is scoped to add a single 115/13.2 kV transformer with two or three feeders.

7.4.10 Downtown East Station

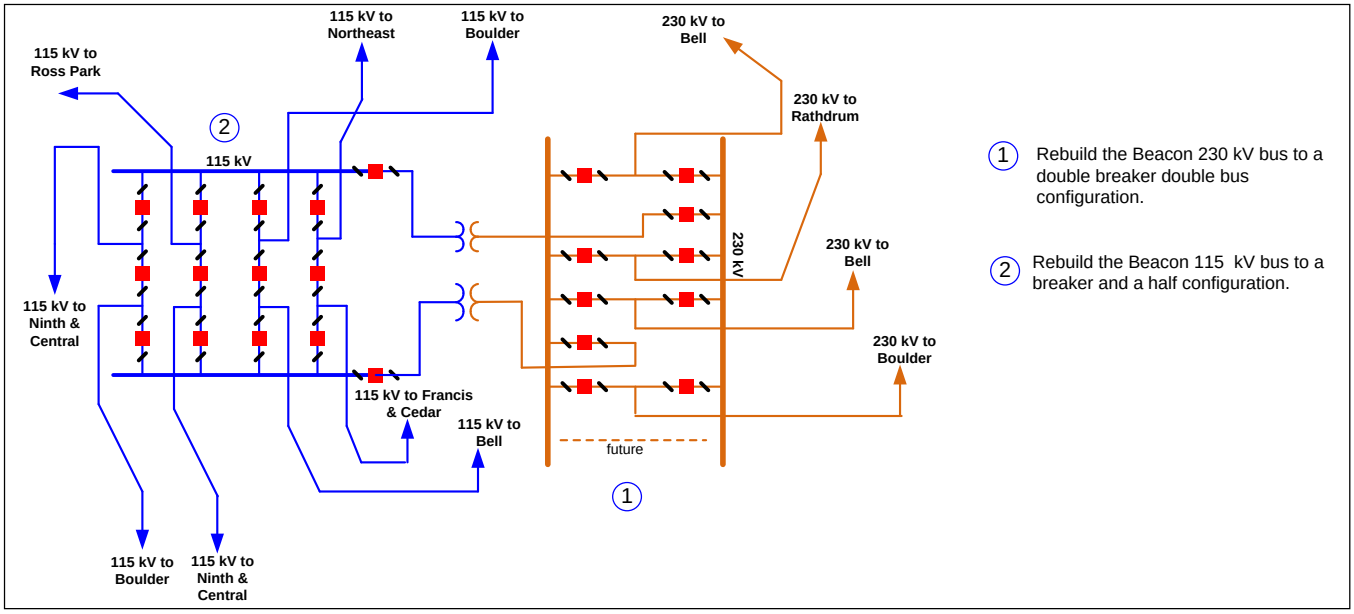
A new distribution station has been proposed on the eastern edge of the downtown Spokane area. The new station has been named Downtown East Station. Integration with the Transmission System has not been determined.

7.4.11 Beacon – Bell – Francis & Cedar – Waikiki Reconfiguration

The existing Beacon – Francis & Cedar 115 kV Transmission Line passes near BPA's Bell Station. A project has been proposed to loop the transmission line into Bell Station to increase the 115 kV ties between Beacon and Bell. Moving the existing Waikiki tap off of the Bell – Northeast 115 kV Transmission Line could be accommodated with Waikiki Station directly connected to the new Bell – Francis & Cedar 115 kV Transmission Line. Further evaluation to the impacts of 230/115 kV transformer loading is warranted. A new interconnection at Bell Station will require a Line and Load Request to be submitted to BPA.

7.4.12 Beacon Station Rebuild

The Beacon Station is integral to the transmission system performance in the Spokane area. Presently the bus configurations at both the 115 kV and 230 kV levels contain a single point of failure at the bus tie breakers. A internal breaker failure or failure of a tie breaker to operate during a fault condition will result in the loss of either all 115 kV or 230 kV facilities at the station. Reconfiguration of the 230 kV bus to a double breaker, double bus has been proposed. The 115 kV bus is desired to be configured as either breaker and a half or double bus, double breaker depending on constructability constraints. Coordination of the Beacon Station Rebuild project with other 230 kV related projects in the Spokane area is necessary. Construction of the Ninth & Central 230 kV Integration project may defer the need to execute the Beacon Station Rebuild project and may be necessary to facilitate the outage requirements during construction.



7.4.13 Hallett & White Capacitor Bank

The addition of a single 30 MVAr switchable capacitor bank at Hallett & White Station has been proposed. The capacitor bank will support voltage in the surrounding area and improve performance during contingency scenarios including outages on the existing Sunset – Westside 115 kV Transmission Line.

7.4.14 Hallett & White – Silver Lake 115 kV Transmission Line Rebuild

A rebuild of the Hallett & White to Silver Lake segment of the South Fairchild Tap 115 kV Transmission Line is proposed. The transmission line will be rebuilt with 795 ACSR conductor with minimum thermal capacity of 150 MVA at 40C. Other segments of the South Fairchild Tap 115 kV Transmission Line have been reconstructed in recent years.

7.4.15 Deer Park Partial Rebuild

Since acquiring the 13kV portion of the Deer Park station from BPA, some upgrades are needed to bring it in line with AVA standards. Scheduled for 2014 are a panelhouse, SCADA, and upgraded metering. Eventually we will need to replace the transformer with an Avista standard unit.

7.4.16 College and Walnut Consolidation/Rebuild

Yard expansion at College & Walnut Station is currently underway. Land was acquired in 2011 east of the current footprint, this will allow for the station and regulator yards to be in the same place. Due to proximity to Kendall Yards, the new site will be walled off with a concrete fence, but will allow for future upgrades as needed.

7.4.17 Westside Station Rebuild

The Westside Station has been identified for partial or complete rebuild to address potential equipment issues and/or improve reliability of the transmission system. Reconfiguration of the 230 kV bus from main/aux to double bus, double breaker will prevent a bus outage from taking both transformers and 230 kV transmission lines serving the station out of service. The existing 115 kV bus is a single bus and is proposed to be reconstructed as a breaker and a half. The 115 kV transmission lines connected to Westside Station are the primary source to supply customer demand on the western side of Spokane. A 115 kV bus outage at Westside Station jeopardizes the reliability of service to the area. The execution of the Westside Station Rebuild project will be initiated as necessary to meet desired performance requirements and Asset Management analysis.

7.4.18 Ninth & Central Station Upgrade

Moving the Ninth & Central load off of the Ninth & Central – Sunset 115 kV Transmission Line onto the 115 kV buses has been identified as a mitigation project for a tie breaker failure at Ninth & Central Station. The existing station layout is configured for two 30 MVA 115/13 kV transformers and six distribution feeders. Each transformer would be connected to separate 115 kV buses and a distribution bus tie would be installed. The existing distribution station would be removed entirely. In addition, the Eighth & Fancher – Latah Junction 115 kV Transmission Line would be moved into Ninth & Central with its own 115 kV breaker bay.

7.4.19 Southeast Capacity Increase

Increase distribution capacity is required local to the existing Southeast Station. The scope of adding capacity is under evaluation. Alternatives considered include increasing the capacity of a transformer at Southeast Station to accommodate the addition of a new feeder and construction of a new distribution station southeast of Southeast Station.

7.6 Spare Equipment Study

Facility rating violations from the Spare Equipment Study are provided in Table III-18.

7.6.1 Beacon Transformer Failure

Failure of a Beacon #1 or #2 230/115 kV transformer requiring complete replacement causes thermal overloads on the remaining Beacon transformer and several local 115 kV transmission lines when a subsequent transformer outage, bus outage, or breaker failure occurs.

Execution of previously identified projects will contribute towards mitigating the thermal overloads observed for a Beacon #1 or #2 230/115 kV transformer failure. The projects include Garden Springs Station Integration, Westside Transformer Replacement, and Spokane Valley Transmission Reinforcement. In addition the installation of a 250 MVA, 230/115 kV transformer at Ninth & Central Station and looping either the Beacon – Bell #4 or #5 230 kV transmission lines into Ninth & Central Station will be required to mitigate the overload issues caused by Beacon #1 or #2 230/115 kV transformer failures. The addition of a 230/115 kV transformer at Ninth & Central Station increases the transformation capacity in the Spokane area and mitigates the Beacon #1 or #2 230/115 kV Transformer failures.

7.6.2 Boulder Transformer Failure

Failure of a Boulder #1 or #2 230/115 kV transformer requiring complete replacement does not introduce any new transmission system performance issues. Issues present prior to a Boulder transformer outage related to bus outages or breaker failures at Beacon and Bell stations are made slightly worse.

7.6.3 Westside Transformer Failure

Failure of the Westside #2 230/115 kV transformer requiring complete replacement causes thermal overloads on the Westside #1 230/115 kV Transformer with subsequent outages of another 230/115 kV transformer in the Spokane area.

Execution of previously identified projects will mitigate the thermal overloads observed for a Westside #1 or #2 230/115 kV transformer failure. The projects include Garden Springs Station Integration, Westside Transformer Replacement, and Spokane Valley Transmission Reinforcement Project.

7.6.4 Bell Transformer Failure

The Bell #6 230/115 kV Transformer is owned and operated by the BPA. An analysis of the transmission system performance during a Bell transformer failure is included in the Spokane Planning Assessment to establish a point of record for communication and coordination with the BPA. The BPA has an established transformer replacement program where a cold spare transformer could be installed to replace a failed transformer in less than a 12 month timeframe.

Failure of Bell #6 230/115 kV Transformer requiring complete replacement will cause several thermal overload issues for various subsequent outages in the Spokane area. The worst

subsequent outage is the 115 kV tie breaker failure at Beacon Station causing voltage collapse at the stations connected radial to Bell Station.

Row Labels	BEA1	BEA2	BELL	BLD1	BLD2	WES1	WES2
P1							
N-1: Beacon - Bell #1 115 kV							
BEACON N (48023) -> NORTHEAS (48277) CKT 1 at NORTHEAS			129.9 %				
N-1: Beacon - Northeast 115 kV							
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BELL BPA			167.0 %				
N-1: Beacon - Ross Park 115 kV							
WEST (48463) -> WEST (48461) CKT 1 at WEST	105.6 %	105.7 %	106.8 %				140.1 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						113.1 %	
N-1: Bell - Northeast 115 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		103.9 %					
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BEACON S			105.7 %				
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	101.7 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	101.8 %	101.6 %					125.1 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						100.7 %	
N-1: Bell - Westside 230 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		110.0 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	107.7 %						
N-1: Benewah - Pine Creek 230 kV							
Unsolved						0	
WEST (48463) -> WEST (48461) CKT 1 at WEST							119.8 %
N-1: Cabinet - Rathdrum 230 kV							
WEST (48463) -> WEST (48461) CKT 1 at WEST							120.0 %
P2							
BF: 4700 Dworshak-Hatwai, Hatwai 500/230 kV Transformer							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		100.2 %					
WEST (48463) -> WEST (48461) CKT 1 at WEST							121.0 %
BF: 4708 Hatwai-Lower Granite, Dworshak-Hatwai							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		100.2 %					
WEST (48463) -> WEST (48461) CKT 1 at WEST							121.0 %
BF: 4710 Hatwai-Lower Granite, Hatwai 500/230 kV Transformer							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		100.4 %					
WEST (48463) -> WEST (48461) CKT 1 at WEST							121.1 %
BF: A1182 Bell-Lancaster, Lancaster Generator #1 & #2							
WEST (48463) -> WEST (48461) CKT 1 at WEST	100.5 %	100.3 %	103.3 %				126.4 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						101.7 %	
BF: A1588 Libby 230 kV, Conkelley-Libby							
WEST (48463) -> WEST (48461) CKT 1 at WEST							121.1 %
BF: A248 Northeast 115 kV, Bell-Northeast							
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BEACON S			107.3 %				
WEST (48463) -> WEST (48461) CKT 1 at WEST							121.5 %
BF: A370 Bell S1 & S2 230 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		123.5 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	120.9 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	112.9 %	112.8 %					132.8 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						107.1 %	
BF: A388 Bell S2 & S3 230 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		127.0 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	124.8 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	133.0 %	133.2 %		115.2 %	115.2 %		164.0 %
WEST (48463) -> WEST (48461) CKT 2 at WEST	102.8 %	103.0 %				132.5 %	
BF: A410 Westside 115 kV, Sunset-Westside							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		119.8 %	106.0 %				
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	117.3 %		103.6 %				
BF: A413 Westside 115 kV, Ninemile-Westside							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		126.8 %	111.8 %				
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	124.1 %		109.3 %				
BF: A470 Westside 115 kV, College & Walnut-Westside							

Row Labels	BEA1	BEA2	BELL	BLD1	BLD2	WES1	WES2
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N			110.6 %				
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	122.5 %		108.0 %				
Unsolved		0					
BF: A521 Devils Gap East 115 kV, Addy-Devils Gap							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		106.3 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	104.0 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	115.5 %	115.4 %	116.1 %	103.8 %	103.7 %		146.3 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						117.9 %	
BF: A526 Devils Gap East 115 kV, Airway Heights-Devils Gap							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		105.0 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	102.8 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	113.5 %	113.4 %	114.4 %	102.0 %	101.9 %		143.7 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						115.8 %	
BF: A540 Devil's Gap East & West 115 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		106.5 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	104.2 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	115.7 %	115.6 %	116.4 %	104.0 %	103.9 %		146.6 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						118.1 %	
BF: A572 Bell S3 230 kV, Bell-Boundary #3							
WEST (48463) -> WEST (48461) CKT 1 at WEST	105.5 %	105.6 %	116.2 %				136.6 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						110.0 %	
BF: A600 Beacon North & South 115 kV							
BOULDERW (48520) -> OTIS (48311) CKT 1 at OTIS						100.7 %	
NORTHWES (48279) -> FRANCEDR (48127) CKT 1 at FRANCEDR				124.4 %	124.2 %	108.8 %	110.1 %
OPPORTUN (48299) -> CHESTER (48069) CKT 1 at CHESTER						117.5 %	112.5 %
OTIS (48311) -> LIBTYLK (48185) CKT 1 at LIBTYLK				116.7 %	117.1 %	170.4 %	165.3 %
Unsolved			0				
WEST (48461) -> NORTHWES (48279) CKT 1 at NORTHWES				118.1 %	118.0 %	106.0 %	107.0 %
WEST (48463) -> WEST (48461) CKT 1 at WEST				182.6 %	182.4 %		290.4 %
WEST (48463) -> WEST (48461) CKT 2 at WEST				141.1 %	140.9 %	239.4 %	
BF: A604 Beacon North 115 kV, Beacon-Boulder #1							
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BELL BPA			161.4 %				
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2 at NINTHCNT_N	107.5 %			110.4 %	110.3 %	124.6 %	122.4 %
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S			119.5 %				
OTIS (48311) -> LIBTYLK (48185) CKT 1 at LIBTYLK		107.2 %					
WEST (48463) -> WEST (48461) CKT 1 at WEST	109.3 %	142.1 %	127.7 %	113.5 %	113.4 %		165.7 %
WEST (48463) -> WEST (48461) CKT 2 at WEST		109.7 %				134.2 %	
BF: A612 Beacon South 115 kV, Beacon-Boulder #2							
BEACON N (48023) -> NORTHEAS (48277) CKT 1 at NORTHEAS			126.9 %				
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N			118.1 %				
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1 at WAIKIKIT	127.2 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	126.2 %		111.7 %				136.1 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						109.9 %	
BF: A688 Ninth & Central North & South 115 kV							
ROSSPARK (48371) -> THIRHACH (48431) CKT 1 at ROSSPARK	106.0 %	106.3 %	103.3 %	112.7 %	112.8 %	132.2 %	130.0 %
WEST (48463) -> WEST (48461) CKT 1 at WEST	105.6 %	105.4 %	106.9 %				137.8 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						111.1 %	
BF: A717 Boulder East & West 115 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		140.5 %	118.9 %			100.3 %	
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	137.6 %		116.5 %				
DOWER RD (47033)	0.9397	0.9396					
WEST (48463) -> WEST (48461) CKT 1 at WEST	122.6 %	122.6 %	119.8 %				144.0 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						116.0 %	
BF: B1137 Addy 115 kV, Addy-Devils Gap							
BEACON N (48023) -> NORTHEAS (48277) CKT 1 at NORTHEAS			101.5 %				
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		101.8 %					
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BELL BPA			112.3 %				
WEST (48463) -> WEST (48461) CKT 1 at WEST			103.8 %				123.9 %
BF: B1145 Addy 115 kV, Addy-Kettle Falls							

Row Labels	BEA1	BEA2	BELL	BLD1	BLD2	WES1	WES2
BEACON N (48023) -> NORTHEAS (48277) CKT 1 at NORTHEAS			101.5 %				
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		103.5 %					
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BELL BPA			112.3 %				
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	101.3 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	103.7 %	103.6 %	107.9 %				129.4 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						104.3 %	
BF: B354 Bell 115 kV, Bell-Coulee							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		115.8 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	113.3 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	108.6 %	108.4 %					127.8 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						103.0 %	
BF: R318 Noxon East & West 230 kV							
WEST (48463) -> WEST (48461) CKT 1 at WEST			101.9 %				124.9 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						100.5 %	
BF: R404 Cabinet-Rathdrum, Rathdrum #2 230/115 Transformer							
WEST (48463) -> WEST (48461) CKT 1 at WEST							119.8 %
BF: R427 Beacon North & South 230 kV							
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1 at WAIKIKIT	118.5 %	118.5 %		125.9 %	125.7 %	134.2 %	132.0 %
BOULDER (48524)			1.0095				
BOULDERE (48522) -> IRVIN (48165) CKT 1 at IRVIN			107.7 %				
IRVIN (48165) -> MILLWOOD (48237) CKT 1 at MILLWOOD			107.8 %				
NORTHEAS (48277)			0.9467				
NORTHWES (48279) -> FRANCEDR (48127) CKT 1 at FRANCEDR			151.7 %				
OTIS (48311) -> LIBTYLK (48185) CKT 1 at LIBTYLK			104.7 %				
TRENTWOD (41089)			0.9463				
WAIKIKI (48447)			0.9418				
WAIKIKIT (48449)			0.9467				
WEST (48461) -> NORTHWES (48279) CKT 1 at NORTHWES			140.3 %				
WEST (48463) -> WEST (48461) CKT 1 at WEST	134.7 %	134.7 %	208.2 %	143.8 %	143.7 %		205.6 %
WEST (48463) -> WEST (48461) CKT 2 at WEST	103.9 %	103.9 %	160.9 %	111.0 %	110.9 %	166.5 %	
BF: R450 Benewah-Boulder, Boulder #2 230/115 Transformer							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		103.3 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	101.2 %						
BF: R504 Cabinet-Rathdrum, Rathdrum #1 230/115 Transformer							
WEST (48463) -> WEST (48461) CKT 1 at WEST							119.9 %
BF: R550 Benewah-Boulder, Boulder #1 230/115 Transformer							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		103.4 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	101.3 %						
BUS: Addy 115 kV							
BEACON N (48023) -> NORTHEAS (48277) CKT 1 at NORTHEAS			101.3 %				
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		103.4 %					
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BELL BPA			112.1 %				
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	101.2 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	103.8 %	103.7 %	107.9 %				129.6 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						104.4 %	
BUS: Beacon North 115 kV							
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BELL BPA			160.6 %				
BEACON S (48029) -> NINTHCNT_N (48271) CKT 2 at NINTHCNT_N	108.2 %			111.5 %	111.3 %	125.5 %	123.2 %
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S			120.6 %				
OTIS (48311) -> LIBTYLK (48185) CKT 1 at LIBTYLK		105.1 %					
WEST (48463) -> WEST (48461) CKT 1 at WEST	110.4 %	143.5 %	128.9 %	114.9 %	114.8 %		167.4 %
WEST (48463) -> WEST (48461) CKT 2 at WEST		110.8 %				135.6 %	
BUS: Beacon North 230 kV							
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S			118.0 %				
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1 at WAIKIKIT		109.4 %					
WEST (48463) -> WEST (48461) CKT 1 at WEST		127.1 %	126.1 %	103.8 %	103.7 %		145.2 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						117.0 %	

Row Labels	BEA1	BEA2	BELL	BLD1	BLD2	WES1	WES2
BUS: Beacon South 115 kV							
BEACON N (48023) -> NORTHEAS (48277) CKT 1 at NORTHEAS			124.3 %				
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N			122.8 %			101.4 %	100.4 %
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1 at WAIKIKIT	137.3 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	132.3 %		116.8 %	101.1 %	101.0 %		142.8 %
WEST (48463) -> WEST (48461) CKT 2 at WEST	102.1 %					115.3 %	
BUS: Beacon South 230 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N			133.0 %	104.2 %	104.1 %	107.6 %	106.6 %
BELL BPA (40087) -> WAIKIKIT (48449) CKT 1 at WAIKIKIT	119.3 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	135.3 %		126.9 %	103.4 %	103.3 %		145.9 %
WEST (48463) -> WEST (48461) CKT 2 at WEST	104.4 %					117.6 %	
BUS: Bell 115 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		115.8 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	113.4 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	108.5 %	108.4 %					127.8 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						103.0 %	
BUS: Bell S2 230 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		127.6 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	124.9 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	117.2 %	117.0 %					138.0 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						111.2 %	
BUS: Bell S3 230 kV							
WEST (48463) -> WEST (48461) CKT 1 at WEST	105.5 %	105.6 %	116.1 %				136.6 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						110.0 %	
BUS: Boulder West 115 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		112.3 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	109.9 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	104.5 %	104.4 %	104.8 %				127.1 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						102.3 %	
BUS: Devils Gap East 115 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		106.5 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	104.2 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	115.7 %	115.6 %	116.4 %	104.0 %	103.9 %		146.6 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						118.1 %	
BUS: Hatwai 230 kV							
STMARIES (48417)	0.9499	0.9499		0.95	0.95		
WEST (48463) -> WEST (48461) CKT 1 at WEST			100.3 %				122.5 %
BUS: Libby 230 kV							
WEST (48463) -> WEST (48461) CKT 1 at WEST							121.5 %
BUS: Long Lake 115 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		102.4 %					
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	100.2 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST	108.2 %	108.0 %	109.7 %				136.0 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						109.5 %	
BUS: Nine Mile 115 kV							
WEST (48463) -> WEST (48461) CKT 1 at WEST	101.7 %	101.6 %	103.0 %				128.3 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						103.3 %	
BUS: Northeast 115 kV							
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BELL BPA			137.2 %				
BUS: Westside 115 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		128.0 %	112.9 %				
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	125.3 %		110.3 %				
BUS: Westside 230 kV							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		125.2 %	110.7 %				
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	122.5 %		108.2 %				
N-1: Addy - Bell 115 kV Open @ ADD							
BEACON N (48023) -> NORTHEAS (48277) CKT 1 at NORTHEAS			101.6 %				
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		100.1 %					
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BELL BPA			112.3 %				
N-1: Bell - Northeast 115 kV Open @ BEL							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		104.9 %					

Row Labels	BEA1	BEA2	BELL	BLD1	BLD2	WES1	WES2
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BEACON S			105.5 %				
BEACON S (48031) -> BEACON S (48029) CKT 1 at BEACON S	102.6 %						
WEST (48463) -> WEST (48461) CKT 1 at WEST							122.1 %
N-1: Bell - Northeast 115 kV Open @ NE							
BEACON N (48025) -> BEACON N (48023) CKT 1 at BEACON N		101.6 %					
BEACON S (48029) -> BELL BPA (40087) CKT 1 at BELL BPA			135.7 %				
WEST (48463) -> WEST (48461) CKT 1 at WEST							119.9 %
N-1: Cabinet - Rathdrum 230 kV Open @ CAB							
WEST (48463) -> WEST (48461) CKT 1 at WEST							120.0 %
N-1: Cabinet - Rathdrum 230 kV Open @ RAT							
WEST (48463) -> WEST (48461) CKT 1 at WEST							120.0 %
N-1: Nine Mile - Westside 115 kV Open @ NMS							
WEST (48463) -> WEST (48461) CKT 1 at WEST	101.0 %	100.9 %	102.3 %				127.3 %
WEST (48463) -> WEST (48461) CKT 2 at WEST						102.5 %	

7.7 Voltage Stability Study

A Load Ramp PV Curve analysis was conducted while monitoring all buses in the Spokane area. All loads within the Spokane area were increased until voltage collapse occurred. All additional generation necessary to supply the increase in load came from a distribution of all generation in WECC except those within the Spokane area.

The theoretical flow limit is 2500 MW for all lines in service condition. The critical bus under all lines in service condition is Cheney Station. The limiting contingency is the A600 115 kV tie breaker failure at Beacon Station with total area load of 1500 MW (see Figure III-16).

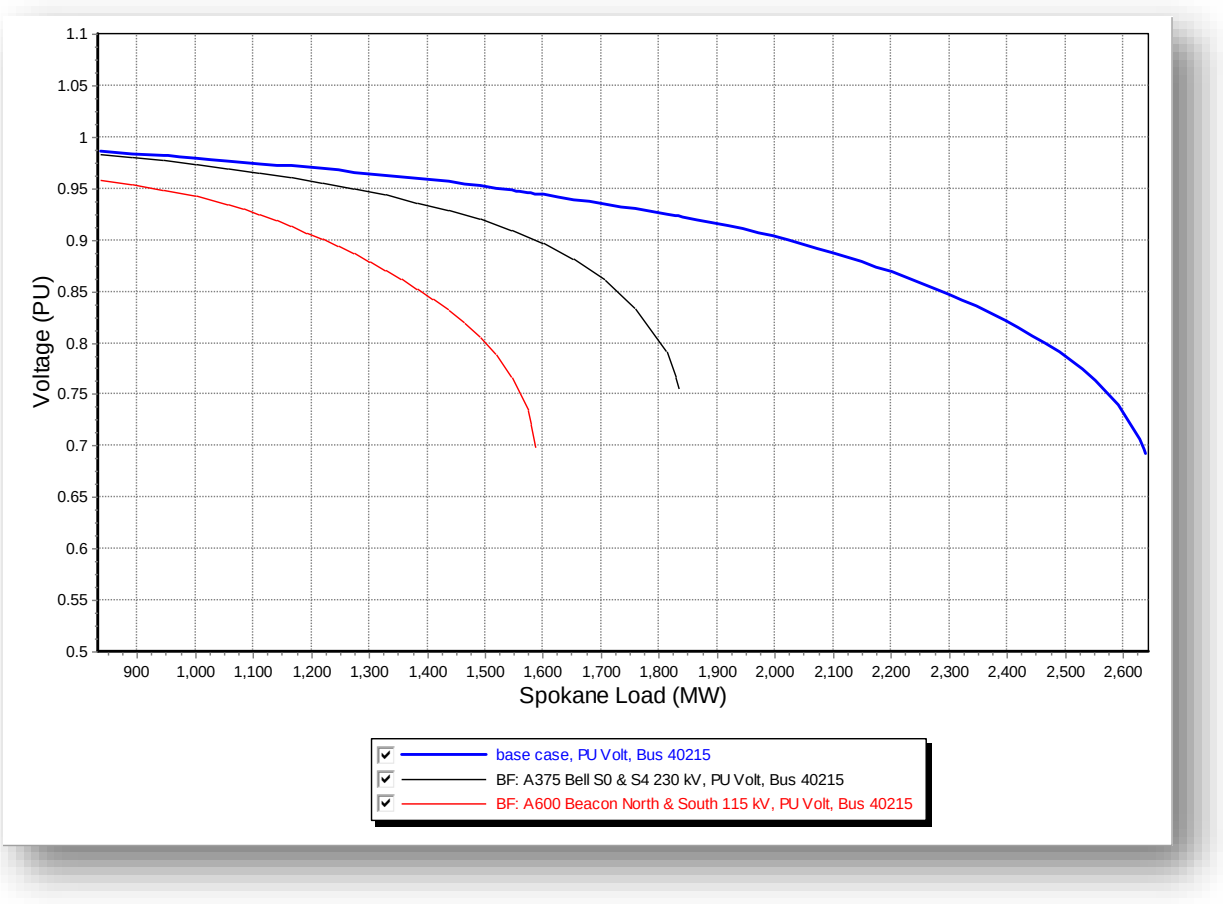


FIGURE III-16: SPOKANE LOAD RAMP PV CURVE RESULTS – EXISTING SYSTEM

The load ramp PV curve analysis was repeated with the assumption that all planned corrective action plans listed above are constructed. The limiting contingency remains the tie breaker failure at Beacon Station but with a total area load of 1900 MW, an increase of 400 MW prior to project construction.

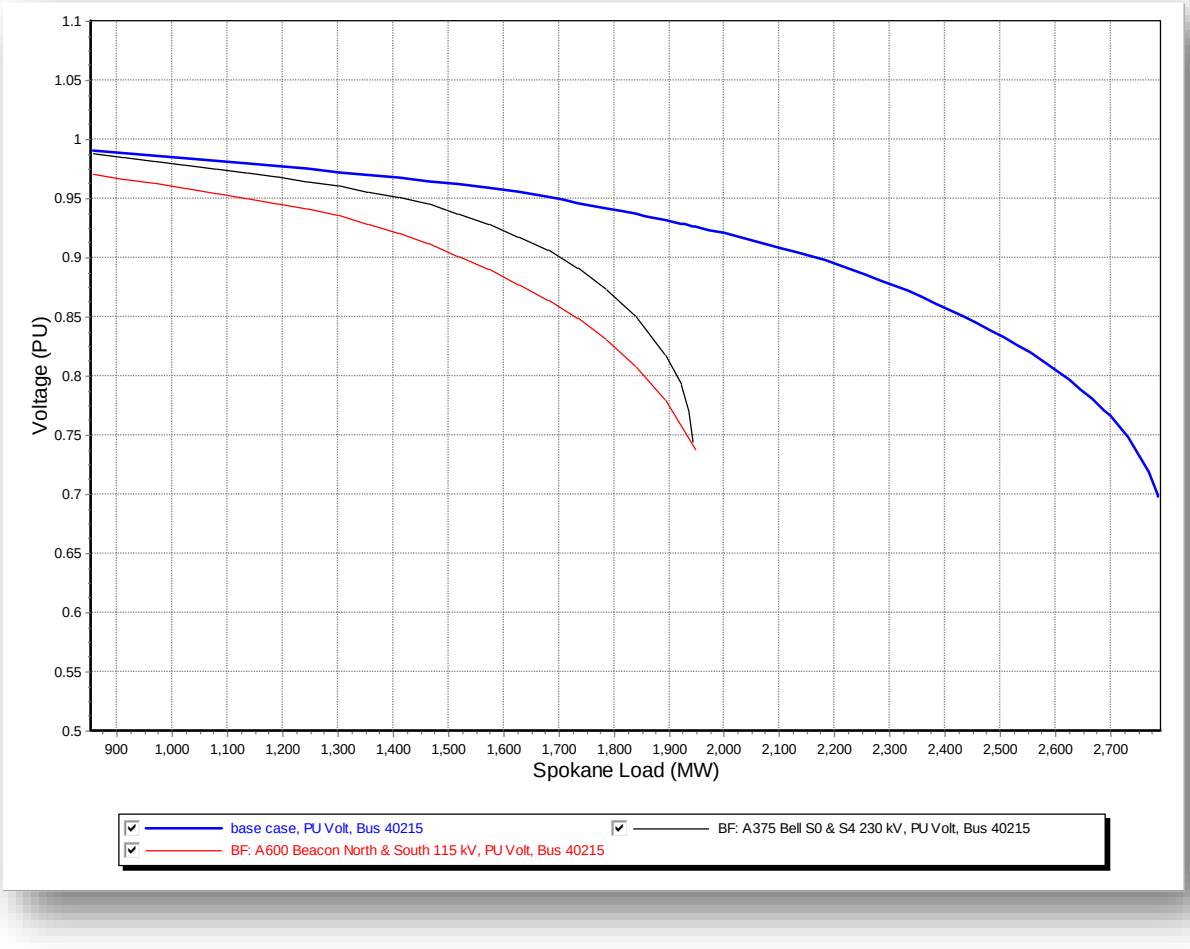


FIGURE III-17: SPOKANE LOAD RAMP PV CURVE RESULTS – PLANNED SYSTEM

7.8 Stability Study Results

Row Labels	16HSLH		20HSLHPROJECTS		25HSLHPROJECTS	
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time
P1						
N-1: Garden Springs - Westside 115 kV 3P @ GDN						
Out of Step Generator						
SPKWASTE 14kV			OOS	1.4 s	OOS	1.4 s
WECC Category B Voltage Dip Non-Load Bus						
SPKWASTE 115kV			-99.9 %		-99.8 %	
SPKWASTE 13.8kV			-80.5 %		-80.1 %	
N-1: Garden Springs - Westside 115 kV 3P @ WES						
Out of Step Generator						
SPKWASTE 14kV			OOS	1.5 s	OOS	1.5 s
WECC Category B Voltage Dip Non-Load Bus						
SPKWASTE 115kV			-98.6 %		-98.6 %	
SPKWASTE 13.8kV			-79.6 %		-79.3 %	
N-1: Metro - Sunset 115 kV 3P @ MTR						
Out of Step Generator						
SPKWASTE 14kV	OOS	2.2 s	OOS	2.2 s	OOS	2.2 s
WECC Category B Voltage Dip Non-Load Bus						
SPKWASTE 13.8kV	-30.6 %		-31.1 %		-31.8 %	
N-1: Nine Mile - Westside 115 kV 3P @ WES						
Out of Step Generator						
NINEMI34 14kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
WECC Category B Voltage Dip Non-Load Bus						
NINEMI34 13.8kV	-30.7 %		-31.1 %		-32.9 %	
P4						
BF: A412 Westside 115 kV, Northwest - Westside 115 kV 3P (NW-WES @WES)						
Out of Step Generator						
NINEMI34 14kV	OOS	1.3 s	OOS	1.3 s	OOS	1.4 s
BF: A413 Westside 115 kV, Nine Mile - Westside 115 kV 3P (NMS-WES @WES)						
Out of Step Generator						
NINEMI34 14kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s
P6						
N-2: Airway Heights - Garden Springs 115 kV and Garden Springs - Westside 115 kV 3P						
Out of Step Generator						
SPKWASTE 14kV			OOS	1.4 s	OOS	1.4 s
WECC Category C Voltage Dip Any Bus						
SPKWASTE 115kV			-99.9 %		-99.8 %	
SPKWASTE 13.8kV			-80.5 %		-80.1 %	
N-2: College & Walnut - Westside 115 kV and Garden Springs - Westside 115 kV 3P						
Out of Step Generator						
SPKWASTE 14kV			OOS	1.5 s	OOS	1.5 s

Row Labels	16HSLH		20HSLHPROJECTS		25HSLHPROJECTS	
	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time	Max of Voltage Dip or Frequency	Max of Duration or Time
WECC Category C Voltage Dip Any Bus						
SPKWASTE 115kV			-98.6 %		-98.6 %	
SPKWASTE 13.8kV			-79.7 %		-79.2 %	
P7						
N-2: Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV 3P						
Out of Step Generator						
NINEMI34 14kV	OOS	1.5 s	OOS	1.5 s	OOS	1.5 s

7.9 Long Term Transmission Plan

The existing transmission system in the Spokane area consists primarily of 115 kV transmission lines serving local load from a few 230 kV stations located in the northern portions of the area. The transmission projects necessary to fix transmission performance issues in the ten year planning horizon as mentioned in previous sections begin to expand the 230 kV transmission system with the construction of Garden Springs Station and adding 230 kV facilities to the existing Ninth & Central Station.

Beyond the ten year planning horizon, a conceptual future transmission system expansion plan has been formed. Figure I-12 shows a preliminary topographical view of the long term transmission plan. The plan illustrates the concept of geographically placed 230 kV stations relative to projected growth areas and tying the stations together. The resulting network of 230 kV transmission lines allows for sufficient operational flexibility to have scheduled outages during all conditions and not have applicable facility ratings exceeded by subsequent outages.

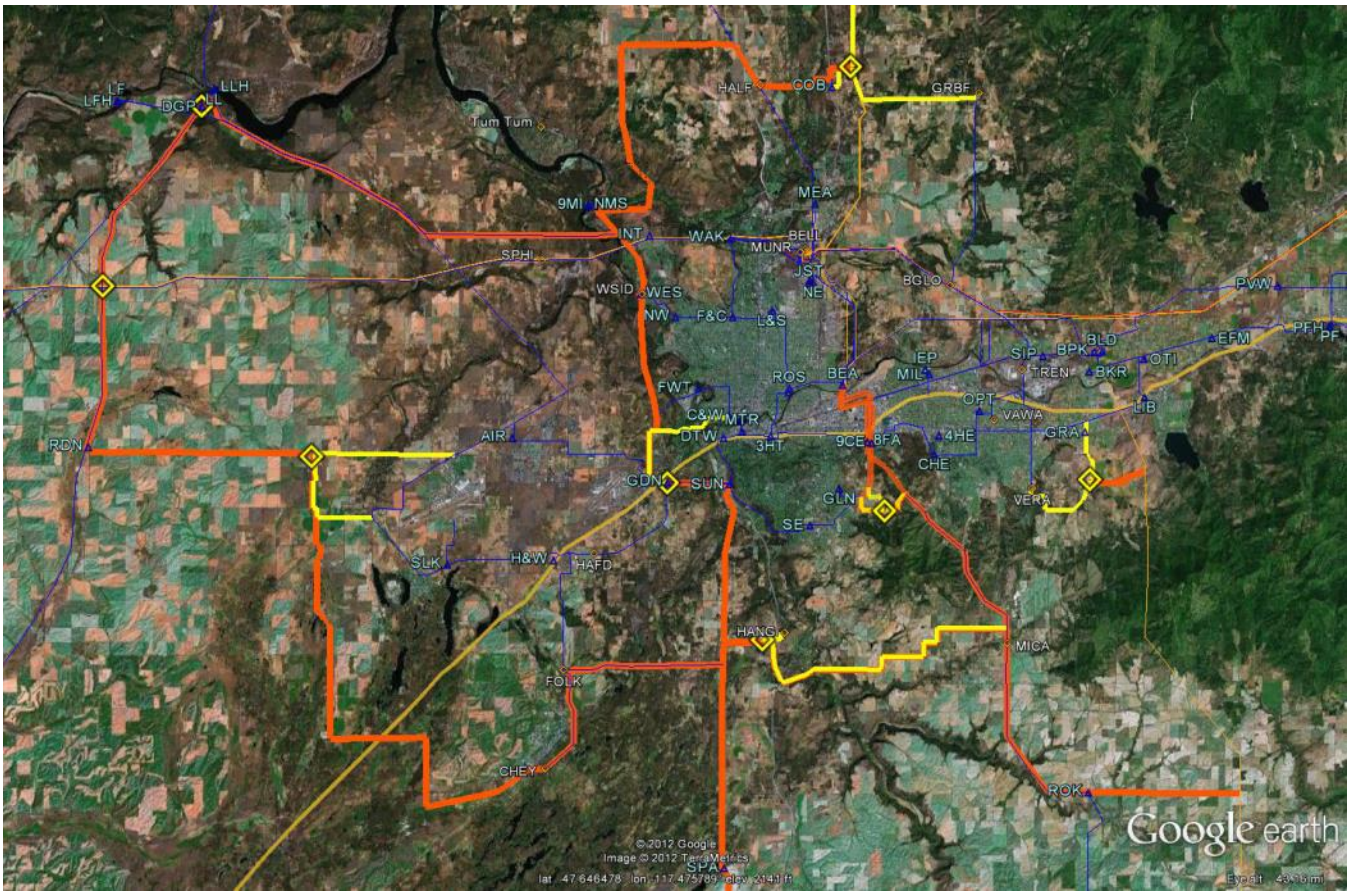


FIGURE I-12: SPOKANE AREA LONG TERM COMCEPTUAL TRANSMISSION PLAN

Each phase of the long term explanation plan will be evaluated and coordinated with appropriate stakeholders. The actual constructed facilities will differ from the proposed plan but should uphold the underlining concept.

Figure III-18 shows a potential layout of executing certain projects of the long term transmission plan in the Spokane area. The timing shown for each project is provided for illustrative purposes. A more complete long term plan is underdevelopment and will be provided in subsequent planning assessments.

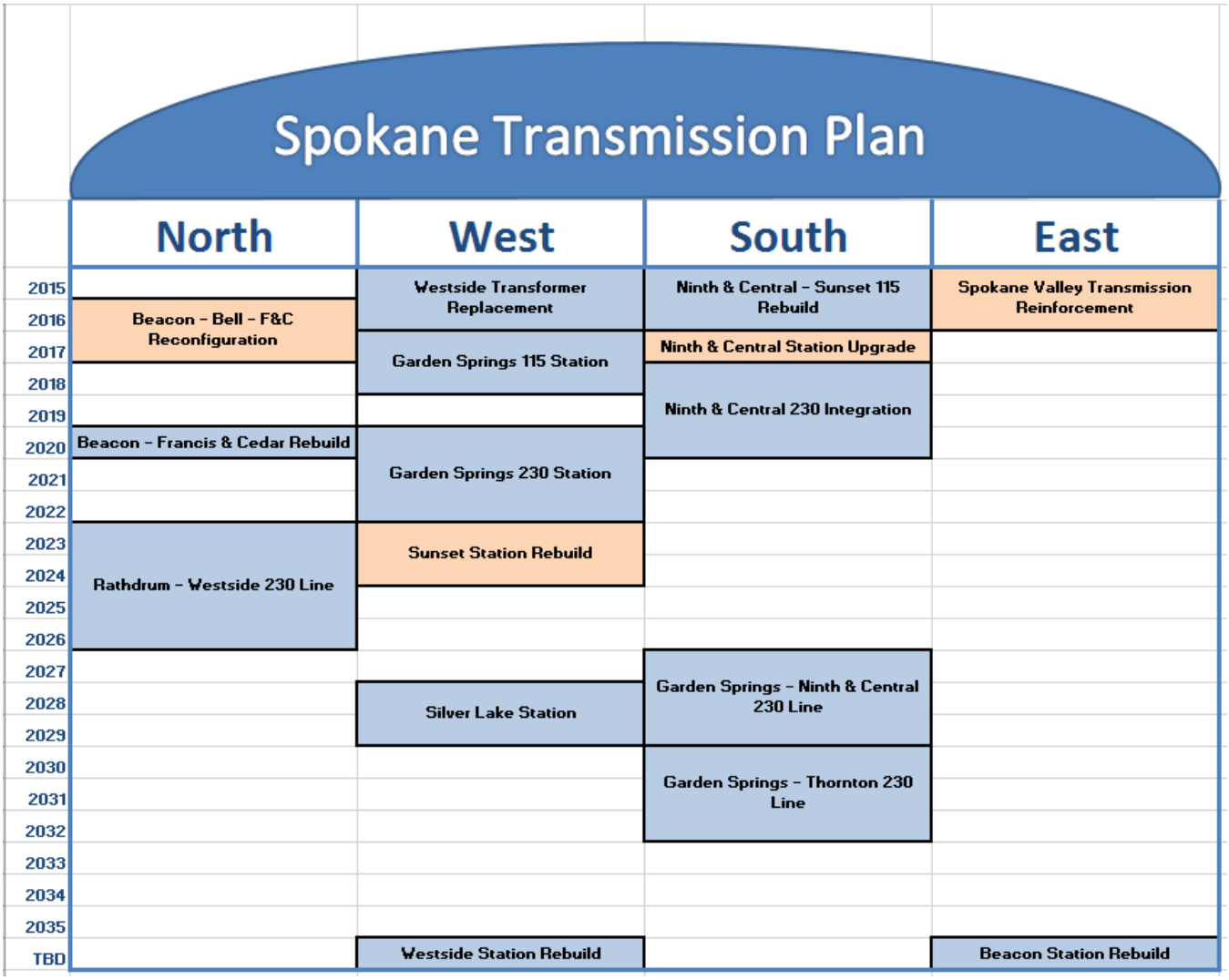


FIGURE III-18: EXAMPLE OF SPOKANE TRANSMISSION PLAN COORDINATION.

8 SENSITIVITY ANALYSIS

8.1 Expected Transfers

8.1.1 Path 6 – West of Hatwai

The Western Electricity Coordinating Council (WECC) transfer path West of Hatwai (Path 6) consists of the sum of flows of 10 lines/transformers with 6 connected with the Avista Transmission system. The Transfer limit of this line is 4277 MW in the East to West direction. The system conditions which result in high West of Hatwai flows include high Western Montana hydro generation, high Colstrip generation, high Boundary generation and light loads. These conditions may most likely occur in the late spring or early summer during off-peak hours. Avista's allocated amount on this path is 600 MW.

Steady State Results

The steady state assessment results identified power transport issues and high voltages. High voltages were mitigated with insertion of future reactive support at Noxon and North Lewiston 230 kV substations and utilizing existing reactive devices within Avista's Transmission System. Potential violations were mitigated with future expected or conceptual projects, existing operating procedures prepared by either Avista or BPA, recommended system adjustments after the first contingency and new longer term project proposals.

The most severe performance issues in the WOH study in Avista's Transmission System were various P1 category potential violations. The N-1 outage of the Burke – Pine Creek No.3 115 kV Line overloads the Burke – Pine Creek No. 4 115 kV Line. Overloads also occurred on the Burke - Pine Creek No.3 115 kV Line for the outage of the Burke – Pine Creek No. 4 115 kV Line. The overloads are exasperated once the Coeur d'Alene– Pine Creek 115 kV Line Rebuild project is complete. Reinforcing this area helps transfer more power through the Coeur d'Alene area to the west however the existing copper conductors are identified as potential bottlenecks.

Other projects such as the Rathdrum – Westside project will help transfer power in an efficient manner from one end of the system to the other, and alleviate the power flow through the 115 kV system. However there are a handful of contingencies this project does not completely mitigate. In addition to this project a potential project may be to reconductor portions of the Boulder – Rathdrum 115 kV line which overloads for the loss of P6 contingencies of Boulder – Lancaster 230 kV Line with various other N-1's. This 115 kV line overloads due to through flow. However the long term 230 kV projects and reinforcing the existing copper conductors of the transmission lines will mitigate future potential violations in the 115 kV transmission system.

Proposed Projects (projects need further analysis)

Burke – Pine Creek 115 kV Reconductor

Project Description

The Burke – Pine Creek No. 3 115 kV Transmission Line presently consists of 795 ACSR, 556 AAC, 556 ACSR, 397 ACSR and 250 CU conductor. Reconductoring 22.5 miles of transmission line to match the 795 ACSR highest rating of the line was assessed.

The Burke – Pine Creek No. 4 115 kV Transmission Line presently consists of 556 AAC and 250 CU conductor. Reconductoring the 23.1 mile transmission line to all 795 ACSR was assessed.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing the 2020 WOH Projects basecase scenario, defined as year 1. However in the interim period, operational actions may be performed during WOH high transfer levels defined above a certain threshold to disable automatic sectionalizing scheme to meet system performance requirements.

Performance Criteria Violations

Row Labels	WOHPROJ
P6	
N-1: Bell - Taft 500 kV + N-1: Burke - Pine Creek #3 115 kV (BUR-LKY)	
BURKE (48051) -> BIGCREEK (48041) CKT 1	**124.1 %**
BUNKRHIL (48049) -> PINE CRK (48315) CKT 1	**120.0 %**
N-1: Bell - Taft 500 kV + N-1: Burke - Pine Creek #4 115 kV (BUR-BIG)	
BURKE (48051) -> LUCKYFTP (48151) CKT 1	**146.4 %**
N-1: Bell - Taft 500 kV + N-1: Burke - Pine Creek #4 115 kV (PIN-BIG)	
BURKE (48051) -> LUCKYFTP (48151) CKT 1	**145.8 %**
OSBURN (48305) -> PINE CRK (48315) CKT 1	**137.4 %**
WALLACE (48453) -> OSBURN (48305) CKT 1	**128.5 %**
LUCKYFTP (48151) -> WALLACE (48453) CKT 1	**108.5 %**
N-1: Burke - Pine Creek #3 115 kV (BUR-LKY) + N-1: Noxon - Pine Creek 230 kV	
BURKE (48051) -> BIGCREEK (48041) CKT 1	**126.0 %**
BUNKRHIL (48049) -> PINE CRK (48315) CKT 1	**121.9 %**
N-1: Burke - Pine Creek #4 115 kV (BUR-BIG) + N-1: Libby - Noxon 230 kV	
BURKE (48051) -> LUCKYFTP (48151) CKT 1	**136.0 %**
OSBURN (48305) -> PINE CRK (48315) CKT 1	**126.7 %**
WALLACE (48453) -> OSBURN (48305) CKT 1	**118.6 %**
LUCKYFTP (48151) -> WALLACE (48453) CKT 1	**100.2 %**
N-1: Burke - Pine Creek #4 115 kV (PIN-BIG) + N-1: Noxon - Pine Creek 230 kV	
BURKE (48051) -> LUCKYFTP (48151) CKT 1	**148.2 %**
OSBURN (48305) -> PINE CRK (48315) CKT 1	**139.4 %**
WALLACE (48453) -> OSBURN (48305) CKT 1	**130.3 %**
LUCKYFTP (48151) -> WALLACE (48453) CKT 1	**110.1 %**
N-1: Noxon - Pine Creek 230 kV + N-1: Burke - Pine Creek #3 115 kV (BUR-LKY)	
BURKE (48051) -> BIGCREEK (48041) CKT 1	**126.0 %**
BUNKRHIL (48049) -> PINE CRK (48315) CKT 1	**121.9 %**
N-1: Noxon - Pine Creek 230 kV + N-1: Burke - Pine Creek #3 115 kV (PIN-LKY)	
BURKE (48051) -> BIGCREEK (48041) CKT 1	**115.2 %**
BUNKRHIL (48049) -> PINE CRK (48315) CKT 1	**111.0 %**

Boulder – Rathdrum 115 kV Reconductor

Project Description

The Boulder – Rathdrum 115 kV Transmission Line presently consists of 795 AAC, 556 AAC, 397 ACSR and 250 CU conductor. Reconductoring 9.1 miles of the 250 Cu transmission line to 795 AAC to match the highest rating of the line was assessed.

This project should be completed after the installation of the Rathdrum – Westside 230 kV Line. Currently, Rathdrum – Westside 230 kV Line is to be completed by 2034.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing the 2020 WOH basecase and Projects scenarios. However in the interim period, operational actions may be performed after the first N-1 occurs to reduce generation at Rathdrum in preparation for the next outage to meet system performance requirements.

Performance Criteria Violations

Row Labels	WOH	WOHPROJ
NA		
RES: N-2 (STR): Post Falls - Ramsey 115 kV & Ramsey - Rathdrum #1 115 kV		
IDAHO_RD (48161) -> PLEASANT (48319) CKT 1		103.1 %
P6		
N-1: Beacon - Rathdrum 230 kV + N-1: Boulder - Lancaster 230 kV		
IDAHO_RD (48161) -> PLEASANT (48319) CKT 1	151.3 %	167.9 %
N-1: Bell - Lancaster 230 kV + N-1: Boulder - Lancaster 230 kV		
IDAHO_RD (48161) -> PLEASANT (48319) CKT 1	152.3 %	170.4 %
P7		
N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV		
MOAB (47511) -> BOULDERE (48522) CKT 1	145.0 %	161.6 %
N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV		
MOAB (47511) -> BOULDERE (48522) CKT 1	159.6 %	178.1 %

Beacon – Boulder #2 115 kV/Boulder – Irvin No.2 115 kV Reconductor

Project Description

Once the Spokane Valley Reinforcement Project is implemented the Beacon – Boulder No. 1 115 KV Line overloads. The overloads are alleviated with the Ninth and Central 230 kV Integration project however there are a few P6 and P7 contingencies with potential violations. Reconductoring the 1.82 miles of 556 AAC conductor with 795 AAC will mitigate any potential future violations.

This project should be completed before the installation of the Spokane Valley Reinforcement Project. Currently, the Spokane Valley Reinforcement Project is scheduled to be completed by 2017.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in scenarios representing the 2020 WOH and Projects basecase scenario. However in the interim period, operational actions may be performed after the first N-1 occurs to reduce generation at Rathdrum, Boulder and/or Lancaster in preparation for the next outage to meet system performance requirements.

Performance Criteria Violations

Row Labels	WOH	WOHPROJ
NA		
RES: N-2 (ROW): Beacon - Boulder 230 kV and Beacon - Rathdrum 230 kV and Beacon - Boulder #1 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	128.2 %	154.9 %
P6		
N-1: Beacon - Boulder 230 kV + N-1: Benewah - Boulder 230 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	112.1 %	128.7 %
N-1: Beacon - Boulder 230 kV + N-1: Benewah - Moscow 230 230 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	115.2 %	137.0 %
N-1: Beacon - Boulder 230 kV + N-1: Boulder - Irvin #2 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	127.6 %	157.3 %
N-1: Beacon - Boulder 230 kV + N-1: Opportunity - Otis Orchards 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	119.0 %	146.1 %
N-1: Beacon - Rathdrum 230 kV + N-1: Boulder - Irvin #2 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	118.1 %	139.2 %
N-1: Beacon - Rathdrum 230 kV + N-1: Opportunity - Otis Orchards 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	111.2 %	130.8 %
N-1: Bell - Lancaster 230 kV + N-1: Boulder - Irvin #2 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	122.6 %	145.4 %
N-1: Bell - Lancaster 230 kV + N-1: Opportunity - Otis Orchards 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	115.2 %	136.3 %
N-1: Bell - Taft 500 kV + N-1: Boulder - Irvin #2 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	114.6 %	136.7 %
N-1: Bell - Westside 230 kV + N-1: Boulder - Irvin #2 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	113.4 %	130.3 %
N-1: Benewah - Boulder 230 kV + N-1: Boulder - Irvin #2 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	107.8 %	121.7 %
N-1: Benewah - Moscow 230 230 kV + N-1: Boulder - Irvin #2 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	112.4 %	130.0 %
N-1: Boulder - Irvin #2 115 kV + N-1: Opportunity - Otis Orchards 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	127.8 %	151.0 %
N-1: Boulder - Otis Orchards #1 115 kV + N-1: Boulder - Irvin #2 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	101.9 %	
P7		
N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder #2 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	121.0 %	146.3 %
N-2 (STR): Beacon - Boulder 230 kV & Beacon - Rathdrum 230 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	128.1 %	156.7 %
N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	100.5 %	117.1 %
N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV		
BOULDERW (48520) -> SPKINDPK (48405) CKT 1	127.6 %	157.3 %

Assessment Table

The Assessment table includes a summary of the contingencies with largest potential violations sorted by projects. To review a complete table with projects, operator actions and/or system adjustments refer to Appendix B.

Extreme Events

No extreme event simulated yielded results with more adverse effects than those already described in the previous sections.

Stability Study Results

This years sensitivity results reflected large deviations for the Hungry Horse and Libby units which then included many potential violations in the Couer d'alene area. Also units in the Western Montana Hydro system and many units within the Spokane area were dispatched using a tool in Powerworld i.e. line loading replicator which defined these units beyond their acceptable limits. Therefore many of the potential violations in this year's assessment will need to be re-evaluated in next years study. A study will need to be performed to identify if any of the new issues are valid because of the new configuration in the Couer d'alene area. Other assumptions that will need to be addressed before the next assessment is the models provided for the Hungry Horse and Libby units. Avista's Transmission Planning group will reach out to BPA's Transmission Planning group for updated models, if any.

The data set discussed was filtered out of potential violation list for further investigation. The remainder of potential violations are included below. The list of violations have been identified in previous sections/studies and have existing corrective action plans.

Assess a new governor for Monroe units

- **BF: AXXX Irvin - Opportunity 115 kV, Beacon - Irvin #2 115 kV 3P (IRV-OPP @IRV)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'
  - WECC Category C Voltage Dip Any Bus
    - Bus '48241'
- **N-1: Ninth & Central - Opportunity 115 kV 3P @ OPT**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'
- **N-1: Ninth & Central - Sunset 115 kV 3P @ SUN**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'
- **N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV 3P**
  - WECC Category C Voltage Dip Any Bus
    - Bus '48241'
- **PSF: Boulder East 115 kV 3P**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'
- **PSF: Sunset 115 kV 3P**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'
  - WECC Category C Voltage Dip Any Bus
    - Bus '48241'

BPA Issue but Saddle Mountain may mitigate

- **N-2: Benton - Midway #1 115 kV and Benton - Othello SS 115 kV 3P**
  - Out of Step Generator
    - Gen '40959' '1'
  - WECC Category C Voltage Dip Any Bus
    - Bus '40377'
    - Bus '40379'
    - Bus '40861'
    - Bus '40919'
    - Bus '40959'
  - WECC Category C Voltage Dip Any Bus Duration
    - Bus '40377'

Bus '40919'
Bus '40959'

Correspond with Inland Empire Paper Co.

BF: AXXX Boulder - Irvin #1 115 kV, Beacon - Irvin #1 115 kV 3P (BEA-IRV @IRV)
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'

BF: AXXX Irvin - IEP 115 kV, Boulder - Irvin #2 115 kV 3P (BLD-IRV @BLD)
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'

BF: AXXX Irvin - Opportunity 115 kV, Beacon - Irvin #2 115 kV 3P (IRV-OPP @IRV)
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'

BF: R452 Beacon - Boulder 230 kV 3P (BEA-BLD @BLD)
WECC Category C Voltage Dip Any Bus
Bus '48166'
Bus '48168'

N-1: Bell - Taft 500 kV 3P @ Bell
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'

N-1: Ninth & Central - Opportunity 115 kV 3P @ OPT
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'

N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV 3P
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'

PSF: Boulder East 115 kV 3P
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'

PSF: Boulder East 115 kV SLG
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'

Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
PSF: Ramsey 115 kV 3P
WECC Category C Voltage Dip Any Bus
Bus '48163'
PSF: Sunset 115 kV 3P
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'

Devils Gap Bus Reconfiguration Project

BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @ADD)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @ADD)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV 3P (DGP-LL #1 @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV SLG (DGP-LL #1 @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BF: A524 Devils Gap 115 kV, Devils Gap - Little Falls #1 115 kV 3P (DGP-LF #1 @DGP)
Out of Step Generator
Gen '48205' '1'
Gen '48207' '2'
Gen '48209' '3'
Gen '48211' '4'
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'

Gen '48191' '3'
Gen '48191' '4'

BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @NMS)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @NMS)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @AIR)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @AIR)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A538 Devils Gap 115 kV, Devils Gap - Little Falls #2 115 kV 3P (DGP-LF #2 @DGP)
Out of Step Generator
Gen '48205' '1'
Gen '48207' '2'
Gen '48209' '3'
Gen '48211' '4'

BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV 3P (DGP-LL #2 @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV SLG (DGP-LL #2 @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BUS: Devils Gap East 115 kV 3P
Out of Step Generator

Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BUS: Devils Gap East 115 kV SLG
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

PSF: Devils Gap East 115 kV 3P
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

PSF: Devils Gap East 115 kV SLG
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

PSF: Devils Gap West 115 kV 3P
Out of Step Generator
Gen '48205' '1'
Gen '48207' '2'
Gen '48209' '3'
Gen '48211' '4'

Implement high speed, com aided tripping scheme on the Addy - Kettle Falls 115 kV Line

N-1: Addy - Kettle Falls 115 kV 3P @ ADD
Out of Step Generator
Gen '48173' '1'
WECC Category B Frequency
Bus '48173'

Nine mile - Westside Protection Upgrade

BF: A412 Westside 115 kV, Northwest - Westside 115 kV 3P (NW-WES @WES)
Out of Step Generator
Gen '48267' '3'
Gen '48267' '4'

BF: A413 Westside 115 kV, Nine Mile - Westside 115 kV 3P (NMS-WES @WES)
Out of Step Generator
Gen '48265' '1'
Gen '48265' '2'
Gen '48267' '3'
Gen '48267' '4'

N-1: Bell - Taft 500 kV 3P @ Bell
Out of Step Generator
Gen '48267' '3'

N-1: Nine Mile - Westside 115 kV 3P @ WES
Out of Step Generator
Gen '48265' '1'
Gen '48265' '2'
Gen '48267' '3'
Gen '48267' '4'
WECC Category B Voltage Dip Non-Load Bus
Bus '48265'
Bus '48267'
Bus '48269'

N-2: Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV 2LG
Out of Step Generator
Gen '48267' '3'
Gen '48267' '4'

N-2: Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV 3P
Out of Step Generator

Gen '48265' '1'
Gen '48265' '2'
Gen '48267' '3'
Gen '48267' '4'

Metro - Sunset Protection Upgrade

BF: A450 Sunset 115 kV, Metro - Sunset 115 kV 3P (MTR-SUN @MTR)

Out of Step Generator
Gen '48407' '1'

N-1: Metro - Sunset 115 kV 3P @ MTR

Out of Step Generator
Gen '48407' '1'
WECC Category B Voltage Dip Non-Load Bus
Bus '40248'
Bus '40249'
Bus '40555'
Bus '40556'
Bus '40557'
Bus '48407'

8.1.2 Path 8 – Montana to Northwest

The Western Electricity Coordinating Council (WECC) transfer path Montana to Northwest (Path 8) consists of metered tie lines between NorthWestern Energy (NWMT) and Bonneville Power Administration (BPA), plus the metered tie lines between NWMT and Avista Corp. (AVA).

The Transfer limit of this path is 2200 MW in the East to West direction and 1350 in the West to East direction. The system conditions for the 2200MW scenario include high Western Montana hydro generation, high Colstrip generation, and light loads. These conditions may most likely occur in the late spring or early summer during off-peak hours. The system conditions for the 1350MW scenario consist of a heavy spring scenario with heavy loading and low generation in Montana, Colstrip off, and heavy hydro generation in the west. Avista's allocated amount for flows east to west is 382MW.

Steady State Results for MT-NW 2200MW

The steady state assessment results for the MT-NW 2200 MW in the East to West direction scenario identified power transport issues and high voltages. High voltages were mitigated with insertion of future reactive support at Noxon and North Lewiston 230 kV substations and utilizing existing reactive devices within Avista's Transmission System. Potential violations were mitigated with future expected or conceptual projects, existing operating procedures prepared by either Avista or BPA, recommended system adjustments after the first contingency and new longer term project proposals.

The Western Montana Hydro generation is dispatched high in the MT-NW 2200 MW scenario. This triggers many P1 violations. The existing WMH – MT-NW nomogram may be utilized until a longer term project has been studied and vetted through the stakeholder process. P1 contingencies that were identified are: Benewah – Pine Creek 230 kV line, Bronx – Cabinet 115 kV Line, Bronx – Sand Creek 115 kV Line, and Cabinet – Noxon 230 kV line. The Cabinet – Bronx – Sandcreek 115 kV Line Rebuild Project and Sandpoint Reinforcement Project mentioned in previous chapters will help mitigate half of the potential violations identified and

the other half of the potential violations will be addressed with a more comprehensive study on the Coeur d'Alene – Pine Creek 115 kV Line Rebuild. Alternatives to the existing project may consist of rebuilding to a larger conductor, building a second line, or reducing the path rating.

Proposed Projects (projects need further analysis)

Coeur d'Alene – Pine Creek 115 kV Transmission Line Study

Project Description

The Coeur d'Alene - Pine Creek 115 kV Transmission Line Rebuild project presently consists of 556 AAC, 556 ACSR, 397 ACSR and 250 CU conductor. The original scope of work included reconductoring the entire 30 mile line with 795 ACSR conductor and operating the line closed.

It is recommended that this project be reviewed once again to determine if a larger conductor with a rating greater than 250 MVA such as 1272 ACSR is feasible. Other alternatives may be superior such as building a 230 kV line from Pine Creek to Rathdrum or a second 115 kV line from Pine Creek to Coeur d'Alene. Alternatives will be assessed in a comprehensive study early next year (2016) and a decision be made soon after so that there will be no delay in the implementation of this project.

Timeline

System performance analysis indicates an inability of the System to meet the performance requirements in Table 1 of TPL-001-4 in the scenario representing the 2020 MT-NW 2200 E to W, or year one. However in the interim period, operational actions may be performed during MT-NW 2200 E to W high transfer levels with WMH above a certain threshold to curtail generation to meet system performance requirements.

Assessment Table

The Assessment table includes a summary of the contingencies with largest potential violations sorted by projects. To review a complete table with projects, operator actions and/or system adjustments refer to Appendix B.

Extreme Events

No extreme event simulated yielded results with more adverse effects than those already described in the previous sections.

Stability Study Results

This years sensitivity results reflected large deviations for the Hungry Horse and Libby units which then included many potential violations in the Couer d'alene area. Also units in the Western Montana Hydro system and many units within the Spokane area were dispatched using a tool in Powerworld i.e. line loading replicator which defined these units beyond their acceptable limits. Therefore many of the potential violations in this year's assessment will need to be re-evaluated in next years study. A study will need to be performed to identify if any of the new issues are valid because of the new configuration in the Couer d'alene area. Other assumptions that will need to be addressed before the next assessment is the models provided for the Hungry Horse and Libby units. Avista's Transmission Planning group will reach out to BPA's Transmission Planning group for updated models, if any.

The data set discussed was filtered out of potential violation list for further investigation. The remainder of potential violations are included below. The list of violations have been identified in previous sections/studies and have existing corrective action plans.

Assess a new governor for Monroe units
- **N-1: Ninth & Central - Opportunity 115 kV 3P @ OPT**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'

BPA Issue but Saddle Mountain may mitigate
- **N-2: Benton - Midway #1 115 kV and Benton - Othello SS 115 kV 3P**
  - WECC Category C Voltage Dip Any Bus
    - Bus '40377'
    - Bus '40379'
    - Bus '40861'
    - Bus '40919'
    - Bus '40959'
  - WECC Category C Voltage Dip Any Bus Duration
    - Bus '40377'
    - Bus '40919'
    - Bus '40959'

Correspond with Inland Empire Paper Co.
- **BF: AXXX Boulder - Irvin #1 115 kV, Beacon - Irvin #1 115 kV 3P (BEA-IRV @IRV)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus
    - Bus '48163'
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus Duration
    - Bus '48163'
- **BF: AXXX Irvin - IEP 115 kV, Boulder - Irvin #2 115 kV 3P (BLD-IRV @BLD)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus
    - Bus '48163'
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus Duration
    - Bus '48163'
- **BF: AXXX Irvin - Opportunity 115 kV, Beacon - Irvin #2 115 kV 3P (IRV-OPP @IRV)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48166'
    - Bus '48168'

WECC Category C Voltage Dip Any Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
N-1: Ninth & Central - Opportunity 115 kV 3P @ OPT
WECC Category B Frequency
Bus '48163'
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV 3P
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
PSF: Boulder East 115 kV 3P
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
PSF: Boulder East 115 kV SLG
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
Devils Gap Bus Reconfiguration Project
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @ADD)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @DGP)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV SLG (DGP-LL #1 @DGP)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @DGP)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @NMS)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @AIR)
WECC Category C Frequency

Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @DGP)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV SLG (DGP-LL #2 @DGP)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

BUS: Devils Gap East 115 kV SLG
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

PSF: Devils Gap East 115 kV SLG
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

I see distance relays at both stations why is breaiker at sunset opening at 2.083 seconds for a 3 phase fault? Z2=65 cycles???

N-1: Metro - Sunset 115 kV 3P @ MTR
WECC Category B Voltage Dip Non-Load Bus
Bus '48407'

Nine mile - Westside Protection Upgrade

N-1: Nine Mile - Westside 115 kV 3P @ WES
WECC Category B Voltage Dip Non-Load Bus
Bus '48267'

Steady State Results for MT-NW 1350MW

The steady state assessment results for the MT-NW 1350 MW in the West to East direction scenario identified power transport issues and high voltages. High voltages were mitigated with insertion of future reactive support at Noxon and North Lewiston 230 kV substations and utilizing existing reactive devices within Avista's Transmission System. Potential violations were mitigated with future expected or conceptual projects, existing operating procedures prepared by either Avista or BPA, recommended system adjustments after the first contingency. No new longer term project were identified as needed per this study.

There were no P1 violations. Through analysis it was identified that existing projects in the Expansion Plan were sufficient.

Assessment Table

The Assessment table includes a summary of the contingencies with largest potential violations sorted by projects. To review a complete table with projects, operator actions and/or system adjustments refer to Appendix B.

Extreme Events

No extreme event simulated yielded results with more adverse effects than those already described in the previous sections.

Stability Results

This years sensitivity results reflected large deviations for the Hungry Horse and Libby units which then included many potential violations in the Couer d'alene area. Also units in the Western Montana Hydro system and many units within the Spokane area were dispatched using a tool in Powerworld i.e. line loading replicator which defined these units beyond their acceptable limits. Therefore many of the potential violations in this year's assessment will need to be re-evaluated in next years study. A study will need to be performed to identify if any of the new issues are valid because of the new configuration in the Couer d'alene area. Other assumptions that will need to be addressed before the next assessment is the models provided for the Hungry Horse and Libby units. Avista's Transmission Planning group will reach out to BPA's Transmission Planning group for updated models, if any.

The data set discussed was filtered out of potential violation list for further investigation. The remainder of potential violations are included below. The list of violations have been identified in previous sections/studies and have existing corrective action plans.

Assess a new governor for Monroe units

- **BF: AXXX Irvin - Opportunity 115 kV, Beacon - Irvin #2 115 kV 3P (IRV-OPP @IRV)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'
  - WECC Category C Voltage Dip Any Bus
    - Bus '48241'
- **N-1: Ninth & Central - Opportunity 115 kV 3P @ OPT**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'
- **PSF: Boulder East 115 kV 3P**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'
- **PSF: Sunset 115 kV 3P**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'
  - WECC Category C Voltage Dip Any Bus
    - Bus '48241'

BPA Issue but Saddle Mountain may mitigate

- **N-2: Benton - Midway #1 115 kV and Benton - Othello SS 115 kV 3P**
  - WECC Category C Voltage Dip Any Bus
    - Bus '40377'
    - Bus '40379'
    - Bus '40861'
    - Bus '40919'
    - Bus '40959'
  - WECC Category C Voltage Dip Any Bus Duration
    - Bus '40377'
    - Bus '40919'
    - Bus '40959'

Correspond with Inland Empire Paper Co.

- **BF: AXXX Boulder - Irvin #1 115 kV, Beacon - Irvin #1 115 kV 3P (BEA-IRV @IRV)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus

Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
BF: AXXX Irvin - IEP 115 kV, Boulder - Irvin #2 115 kV 3P (BLD-IRV @BLD)
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
BF: AXXX Irvin - Opportunity 115 kV, Beacon - Irvin #2 115 kV 3P (IRV-OPP @IRV)
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
N-1: Ninth & Central - Opportunity 115 kV 3P @ OPT
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV 3P
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
PSF: Boulder East 115 kV 3P
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
PSF: Boulder East 115 kV SLG
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
PSF: Sunset 115 kV 3P
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
I see distance relays at both stations why is breaiker at sunset opening at 2.083 seconds for a 3 phase fault? Z2=65 cycles???
N-1: Metro - Sunset 115 kV 3P @ MTR
WECC Category B Voltage Dip Non-Load Bus
Bus '48407'
Implement high speed, com aided tripping scheme on the Addy - Kettle Falls 115 kV Line

N-1: Addy - Kettle Falls 115 kV 3P @ ADD
WECC Category B Frequency
Bus '48173'
Nine mile - Westside Protection Upgrade
N-1: Nine Mile - Westside 115 kV 3P @ WES
WECC Category B Voltage Dip Non-Load Bus
Bus '48265'
Bus '48267'
Bus '48269'

8.1.3 Path 14 – Idaho to Northwest

The Western Electricity Coordinating Council transfer path, Idaho to Northwest (Path 14) is located Southwest Idaho and Eastern Oregon/Washington and Northern Idaho. The Transfer limit of this path is 2400 MW in the East to West direction and 1200 in the West to East direction. The system conditions for the 2400MW scenario consist of light load conditions, heavy eastern thermal resources, moderate to heavy hydro generation in Idaho, low Western Montana hydro generation, high Colstrip generation, low generation dispatched in Avista's system, and minimal hydro generation in the West. These conditions may most likely occur in the late spring or early summer during off-peak hours. The system conditions for the 1200MW scenario consist of a heavy summer scenario with heavy hydro generation in the Northwest, high Colstrip generation, moderate Nor-Cal hydro generation and moderate to low eastern thermal resources.

Steady State Results for ID-NW 2400MW

The steady state assessment results for the ID-NW 2400 MW in the East to West direction scenario identified power transport issues and high voltages. High voltages were mitigated with insertion of future reactive support at Noxon and North Lewiston 230 kV substations and utilizing existing reactive devices within Avista's Transmission System. Potential violations were mitigated with future expected or conceptual projects, existing operating procedures prepared by either Avista or BPA, recommended system adjustments after the first contingency. No new longer term projects were identified as needed per this study.

There were no P1 violations that have not already been addressed with prior expected or conceptual projects. Through analysis it was identified that existing projects in the Expansion Plan were sufficient.

Assessment Table

The Assessment table includes a summary of the contingencies with largest potential violations sorted by projects. To review a complete table with projects, operator actions and/or system adjustments refer to Appendix B.

Extreme Events

No extreme event simulated yielded results with more adverse effects than those already described in the previous sections.

Stability Results

This years sensitivity results reflected large deviations for the Hungry Horse and Libby units which then included many potential violations in the Couer d'alene area. Also units in the Western Montana Hydro system and many units within the Spokane area were dispatched using a tool in Powerworld i.e. line loading replicator which defined these units beyond their acceptable limits. Therefore many of the potential violations in this year's assessment will need to be re-evaluated in next years study. A study will need to be performed to identify if any of the new issues are valid because of the new configuration in the Couer d'alene area. Other assumptions that will need to be addressed before the next assessment is the models provided for the Hungry Horse and Libby units. Avista's Transmission Planning group will reach out to BPA's Transmission Planning group for updated models, if any.

The data set discussed was filtered out of potential violation list for further investigation. The remainder of potential violations are included below. The list of violations have been identified in previous sections/studies and have existing corrective action plans.

Assess a new governor for Monroe units
- **N-1: Ninth & Central - Opportunity 115 kV 3P @ OPT**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'

BPA Issue but Saddle Mountain may mitigate
- **N-2: Benton - Midway #1 115 kV and Benton - Othello SS 115 kV 3P**
  - WECC Category C Voltage Dip Any Bus
    - Bus '40377'
    - Bus '40379'
    - Bus '40861'
    - Bus '40919'
    - Bus '40959'
  - WECC Category C Voltage Dip Any Bus Duration
    - Bus '40377'
    - Bus '40919'
    - Bus '40959'

Correspond with Inland Empire Paper Co.
- **BF: AXXX Boulder - Irvin #1 115 kV, Beacon - Irvin #1 115 kV 3P (BEA-IRV @IRV)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus
    - Bus '48163'
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus Duration
    - Bus '48163'
- **BF: AXXX Irvin - IEP 115 kV, Boulder - Irvin #2 115 kV 3P (BLD-IRV @BLD)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus
    - Bus '48163'
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus Duration
    - Bus '48163'
- **BF: AXXX Irvin - Opportunity 115 kV, Beacon - Irvin #2 115 kV 3P (IRV-OPP @IRV)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48166'
    - Bus '48168'

WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
N-1: Ninth & Central - Opportunity 115 kV 3P @ OPT
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV 3P
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
PSF: Boulder East 115 kV 3P
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
PSF: Boulder East 115 kV SLG
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'

Devils Gap Bus Reconfiguration Project

BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @ADD)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @DGP)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV SLG (DGP-LL #1 @DGP)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @DGP)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @NMS)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @AIR)
WECC Category C Frequency
Bus '40449'

Bus '48193'
Bus '48363'
Bus '48411'

BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @DGP)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV SLG (DGP-LL #2 @DGP)
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

BUS: Devils Gap East 115 kV SLG
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

PSF: Devils Gap East 115 kV SLG
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

I see distance relays at both stations why is breaiker at sunset opening at 2.083 seconds for a 3 phase fault? Z2=65 cycles???

N-1: Metro - Sunset 115 kV 3P @ MTR
WECC Category B Voltage Dip Non-Load Bus
Bus '48407'

Steady State Results for ID-NW 1200MW

The steady state assessment results for the MT-NW 1200 MW in the West to East direction scenario identified no new issues in addition to the Summer and Winter Peak assessments. Potential violations were mitigated with future expected or conceptual projects, existing operating procedures prepared by either Avista or BPA, or recommended system adjustments after the first contingency. No new longer term projects were identified as needed per this study.

There were no P1 violations that have not already been addressed with prior expected or conceptual projects. Through analysis it was identified that existing projects in the Expansion Plan were sufficient.

Assessment Table

The Assessment table includes a summary of the contingencies with largest potential violations sorted by projects. To review a complete table with projects, operator actions and/or system adjustments refer to Appendix B.

Extreme Events

No extreme event simulated yielded results with more adverse effects than those already described in the previous sections.

Stability Results

This years sensitivity results reflected large deviations for the Hungry Horse and Libby units which then included many potential violations in the Couer d'alene area. Also units in the Western Montana Hydro system and many units within the Spokane area were dispatched using a tool in Powerworld i.e. line loading replicator which defined these units beyond their acceptable limits. Therefore many of the potential violations in this year's assessment will need to be re-evaluated in next years study. A study will need to be performed to identify if any of the new issues are valid because of the new configuration in the Couer d'alene area. Other assumptions that will need to be addressed before the next assessment is the models provided for the Hungry Horse and Libby units. Avista's Transmission Planning group will reach out to BPA's Transmission Planning group for updated models, if any.

The data set discussed was filtered out of potential violation list for further investigation. The remainder of potential violations are included below. The list of violations have been identified in previous sections/studies and have existing corrective action plans.

Assess a new governor for Monroe units
- **N-1: Ninth & Central - Opportunity 115 kV 3P @ OPT**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48241'

BPA Issue but Saddle Mountain may mitigate
- **N-2: Benton - Midway #1 115 kV and Benton - Othello SS 115 kV 3P**
  - Out of Step Generator
    - Gen '40959' '1'
  - WECC Category C Voltage Dip Any Bus
    - Bus '40377'
    - Bus '40379'
    - Bus '40861'
    - Bus '40919'
    - Bus '40959'
  - WECC Category C Voltage Dip Any Bus Duration
    - Bus '40377'
    - Bus '40919'
    - Bus '40959'

Coordinate with generator owners to obtain correct data
- **PSF: Metro 115 kV 3P**
  - Out of Step Generator
    - Gen '48407' '1'

Correspond with Inland Empire Paper Co.
- **BF: AXXX Boulder - Irvin #1 115 kV, Beacon - Irvin #1 115 kV 3P (BEA-IRV @IRV)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus
    - Bus '48163'
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus Duration
    - Bus '48163'
- **BF: AXXX Irvin - IEP 115 kV, Boulder - Irvin #2 115 kV 3P (BLD-IRV @BLD)**
  - WECC Category B Voltage Dip Non-Load Bus
    - Bus '48166'
    - Bus '48168'
  - WECC Category C Voltage Dip Any Bus
    - Bus '48163'
    - Bus '48166'
    - Bus '48168'

WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
BF: AXXX Irvin - Opportunity 115 kV, Beacon - Irvin #2 115 kV 3P (IRV-OPP @IRV)
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
N-1: Ninth & Central - Opportunity 115 kV 3P @ OPT
WECC Category B Frequency
Bus '48163'
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV 3P
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
PSF: Boulder East 115 kV 3P
WECC Category B Voltage Dip Non-Load Bus
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus
Bus '48163'
Bus '48166'
Bus '48168'
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
PSF: Boulder East 115 kV SLG
WECC Category C Voltage Dip Any Bus Duration
Bus '48163'
Devils Gap Bus Reconfiguration Project
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @ADD)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV 3P (ADD-DGP @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @ADD)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A521 Devils Gap 115 kV, Addy - Devils Gap 115 kV SLG (ADD-DGP @DGP)
Out of Step Generator
Gen '48189' '1'

Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV 3P (DGP-LL #1 @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A523 Devils Gap 115 kV, Devils Gap - Long Lake #1 115 kV SLG (DGP-LL #1 @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV 3P (DGP-NMS @NMS)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

BF: A525 Devils Gap 115 kV, Devils Gap - Nine Mile 115 kV SLG (DGP-NMS @NMS)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @AIR)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'

Gen '48191' '4'
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV 3P (AIR-DGP @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @AIR)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A526 Devils Gap 115 kV, Airway Heights - Devils Gap 115 kV SLG (AIR-DGP @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV 3P (DGP-LL #2 @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BF: A539 Devils Gap 115 kV, Devils Gap - Long Lake #2 115 kV SLG (DGP-LL #2 @DGP)
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
BUS: Devils Gap East 115 kV 3P
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
BUS: Devils Gap East 115 kV SLG
Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'
PSF: Devils Gap East 115 kV 3P

Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'

PSF: Devils Gap East 115 kV SLG

Out of Step Generator
Gen '48189' '1'
Gen '48189' '2'
Gen '48191' '3'
Gen '48191' '4'
WECC Category C Frequency
Bus '40449'
Bus '48193'
Bus '48363'
Bus '48411'

I see distance relays at both stations why is breaiker at sunset opening at 2.083 seconds for a 3 phase fault? Z2=65 cycles???

N-1: Metro - Sunset 115 kV 3P @ MTR

Out of Step Generator
Gen '48407' '1'
WECC Category B Voltage Dip Non-Load Bus
Bus '48407'

Nine mile - Westside Protection Upgrade

N-1: Nine Mile - Westside 115 kV 3P @ WES

Out of Step Generator
Gen '48267' '3'
WECC Category B Voltage Dip Non-Load Bus
Bus '48267'

N-2: Bell - Westside 230 kV and Coulee - Westside 230 kV and Ninemile - Westside 115 kV 3P

Out of Step Generator
Gen '48267' '3'

APPENDIX A - PLANNING CASES SUMMARY

2015 Planning Assessment

Planning Case Description

Avista's System Planning Group develops a set of base cases (Planning Cases) biannually to model its Transmission Planner and Planning Coordinator areas as well as the regional Transmission System. The Planning Case development process outlined in the internal document *TP-SPP-04 – Data Preparation for Steady State and Dynamic Studies* is used which includes using WECC approved base cases and applying steady state and dynamic data modifications as required to represent desired scenarios. The resulting Planning Cases represent a normal System condition (N-0). Planning Cases include the following:

- All existing facilities i.e. no planned transmission expansion project models. In past studies, inclusion of non-committed planned transmission models has incorrectly hidden potential reliability and load-service issues. Subsequently, a Corrective Action Plan was not developed as necessary (TPL-001-4, R1.1.1)
- Known outages of generation or Transmission Facilities with a duration of at least six months. Presently, Avista does not have planned outages outside the operations planning horizon. Long duration outages outside of Avista's Transmission Planner or Planning Coordinator areas are typically modeled in WECC approved base cases. (TPL-001-4, R1.1.2, R2.1.3)
- New planned Facilities and changes to existing Facilities. The Transmission System models are updated bi-annually to incorporate constructed projects and changes to existing Facilities. Planning Cases are developed to represent scenarios with and without planned Facilities and changes to existing Facilities; refer to table in Appendix A. (TPL-001-4, R1.1.3)
- Real and reactive Load forecasts. Load forecasts are developed annually and incorporated into the Planning Cases. (TPL-001-4, R1.1.4)
- Known commitments for Firm Transmission Service and Interchange. Developing sensitivity cases with WECC Rated Paths at their limits represents scenarios with all existing known commitments modeled. Future commitments exceeding the limits of WECC Rated Paths are not presently studied. (TPL-001-4, R1.1.5)

The following scenarios are developed to represent various seasonal conditions:

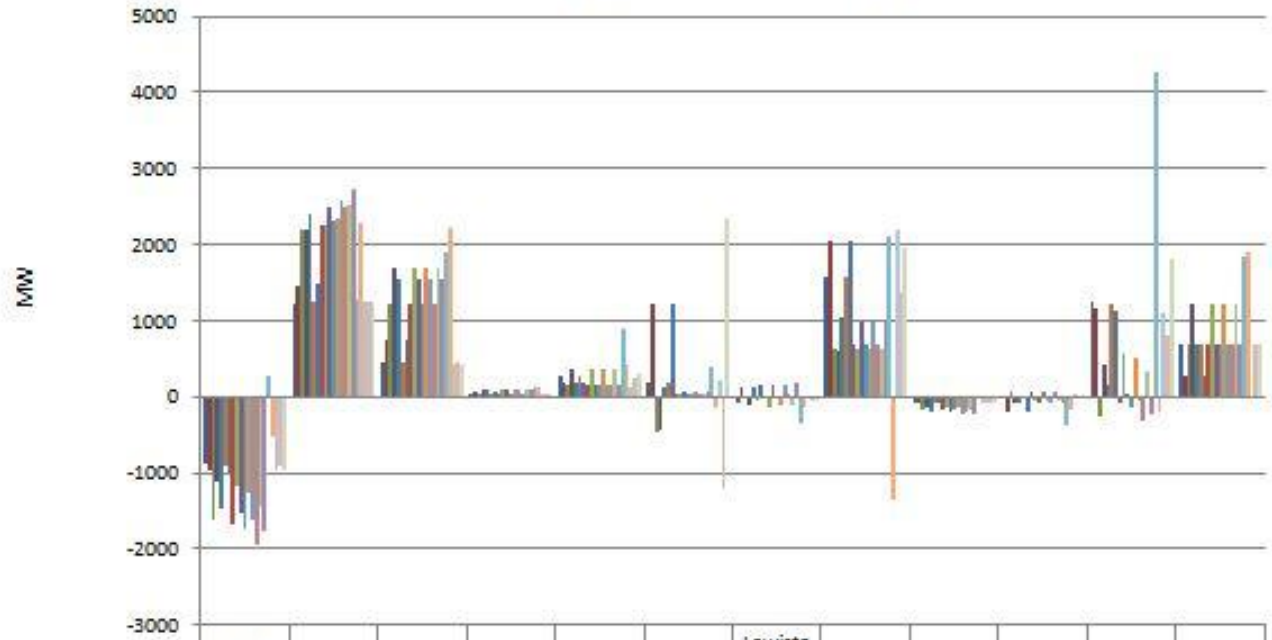
- Heavy Summer and Heavy Winter:
  - Year two (next year, i.e. 2016 case if case is created and used in 2015) (TPL-001-4, R2.1.1, R2.4.1)

- Year five (TPL-001-4, R2.1.1, R2.4.1)
- Year ten (TPL-001-4, R2.2.1, R2.5)

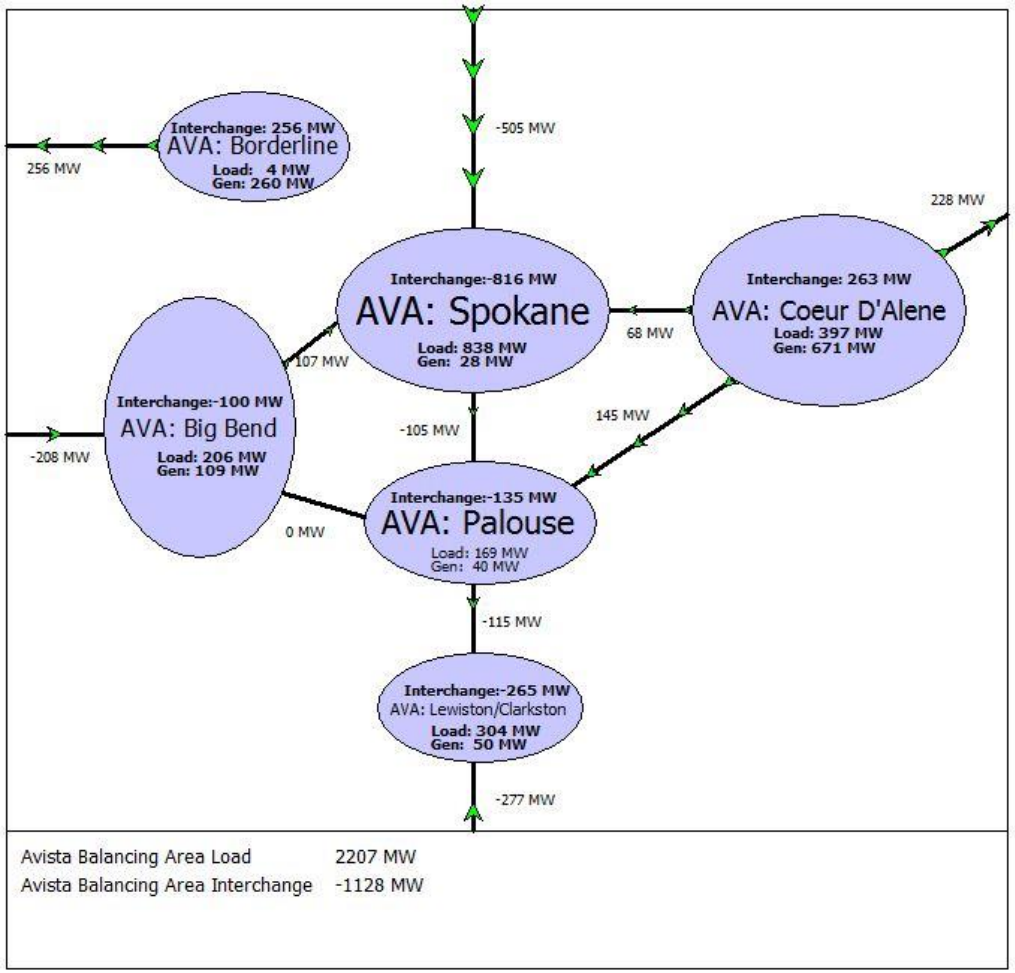
- Light Summer and Light Winter
  - Year two (next year, i.e. 2016 case if case is created and used in 2015) (TPL-001-4, R2.1.2, R2.4.2)
  - Year five (TPL-001-4, R2.1.2, R2.4.2)
- Heavy Summer with Low Local Hydro Generation (generation dispatch scenario sensitivity):
  - Year five (TPL-001-4, R2.1.4, R2.4.3 for R2.1.1 and R2.4.1)
  - Year ten (TPL-001-4, R2.1.4 for R2.1.1)
- Transfer Scenarios
  - West of Hatwai – East to West (TPL-001-4, R2.1.4, R2.4.3 for R2.1.2 and R2.4.2)
  - Montana to Northwest – East to West (TPL-001-4, R2.1.4, R2.4.3 for R2.1.2 and R2.4.2)
  - Montana to Northwest – West to East (TPL-001-4, R2.1.4, R2.4.3 for R2.1.1 and R2.4.1)
  - Idaho to Northwest – East to West (TPL-001-4, R2.1.4, R2.4.3 for R2.1.2 and R2.4.2)
  - Idaho to Northwest – West to East (TPL-001-4, R2.1.4, R2.4.3 for R2.1.1 and R2.4.1)

A.1 Planning Cases

2015 Planning Cases Summary



	Avista Balancing Area Interchange	Avista Balancing Area Load	Avista Generation	Big Bend Area Interchange	Coeur d'Alene Area Interchange	IDAHO - NORTHWEST	Lewiston - Clarkston Area Interchange	MONTANA - NORTHWEST	Palouse Area Interchange	Spokane Area Interchange	WEST OF HATWAI	Western Montana Hydro
16LS	-892	1221	456	10	259	182	-70	1581	-87	-13	1236	690
16LW	-956	1441	757	63	171	1207	138	2049	-78	-193	1147	258
16HSLH	-1624	2194	1204	21	152	-456	-22	633	-172	59	-270	682
16HS	-1128	2207	1698	107	349	-440	-115	601	-135	-70	407	1225
16HW	-1460	2415	1555	87	180	131	133	1031	-208	-88	140	680
20LS	-917	1246	456	10	258	182	-66	1581	-90	-12	1213	690
20LW	-987	1474	757	63	170	1207	144	2050	-82	-193	1117	258
20HSLH	-1675	2240	1208	22	168	23	-26	675	-179	62	-76	682
20HS	-1179	2253	1702	107	364	37	-131	636	-142	-54	582	1225
20HW	-1526	2484	1554	87	148	79	145	987	-215	-68	6	680
25HSLH	-1752	2320	1208	22	165	23	-16	676	-185	63	-149	682
25HS	-1256	2332	1702	108	362	37	-120	640	-149	-54	511	1225
25HW	-1607	2568	1554	87	145	76	165	993	-224	-74	-66	680
35HSLH	-1930	2502	1208	22	159	23	7	681	-201	63	-312	682
35HS	-1434	2514	1702	109	354	37	-98	636	-164	-53	341	1225
35HW	-1762	2728	1554	87	141	73	195	998	-241	-79	-217	680
20WOH	260	1285	1895	119	883	376	-350	2100	-18	-382	4250	1826
20MTNW1350	-517	2272	2223	122	424	-138	-155	-1350	-77	-169	-201	1909
20MTNW2200	-960	1234	408	11	119	220	-25	2200	-89	36	1104	0
20IDNW1200	-917	1246	456	10	243	-1200	-59	1373	-90	-9	819	690
20IDNW2400	-969	1248	406	10	293	2355	-60	1958	-91	-38	1818	690



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CASE HEADER: AVA-15hs4a-16BA2126.pwb

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WESTERN ELECTRICITY COORDINATING COUNCIL

2015 HEAVY SUMMER OPERATING CASE

DECEMBER 5, 2014

[pre-title comments]

history file date Fri Dec 05 15:05:35 2014

present file date Fri Dec 05 15:06:50 2014

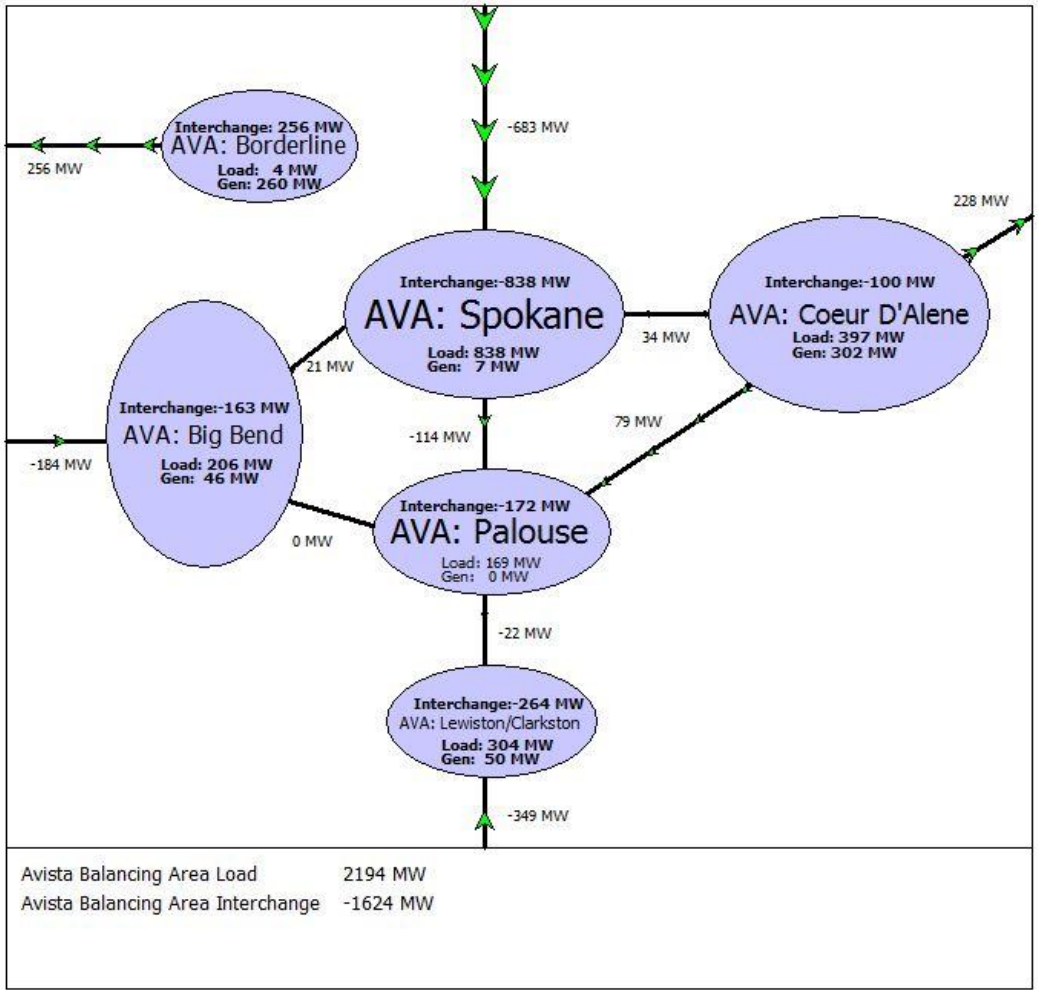
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED

Stratford Strain Bus Replacement Project added

Generators set to Heavy Summer Dispatch



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CASE HEADER: AVA-15hs4a-16BA2126-LH.pwb

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WESTERN ELECTRICITY COORDINATING COUNCIL

2015 HEAVY SUMMER OPERATING CASE

DECEMBER 5, 2014

[pre-title comments]

history file date Fri Dec 05 15:05:35 2014

present file date Fri Dec 05 15:06:50 2014

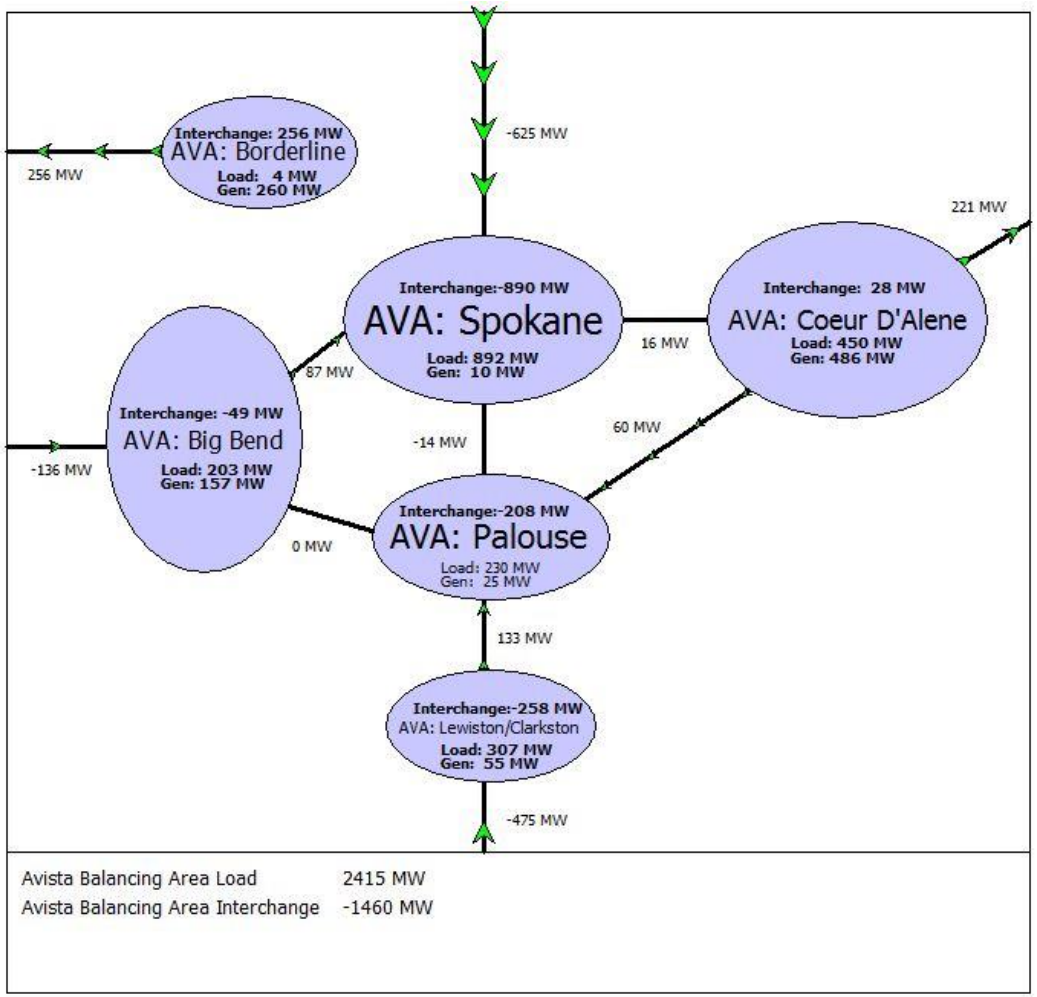
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED

Stratford Strain Bus Replacement Project added

Generators set to Heavy Summer Low Hydro Dispatch



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WESTERN ELECTRICITY COORDINATING COUNCIL

2016 HW3 OPERATING CASE

APRIL 8, 2015

[pre-title comments]

history file date Wed Apr 08 13:00:13 2015

present file date Wed Apr 08 13:30:17 2015

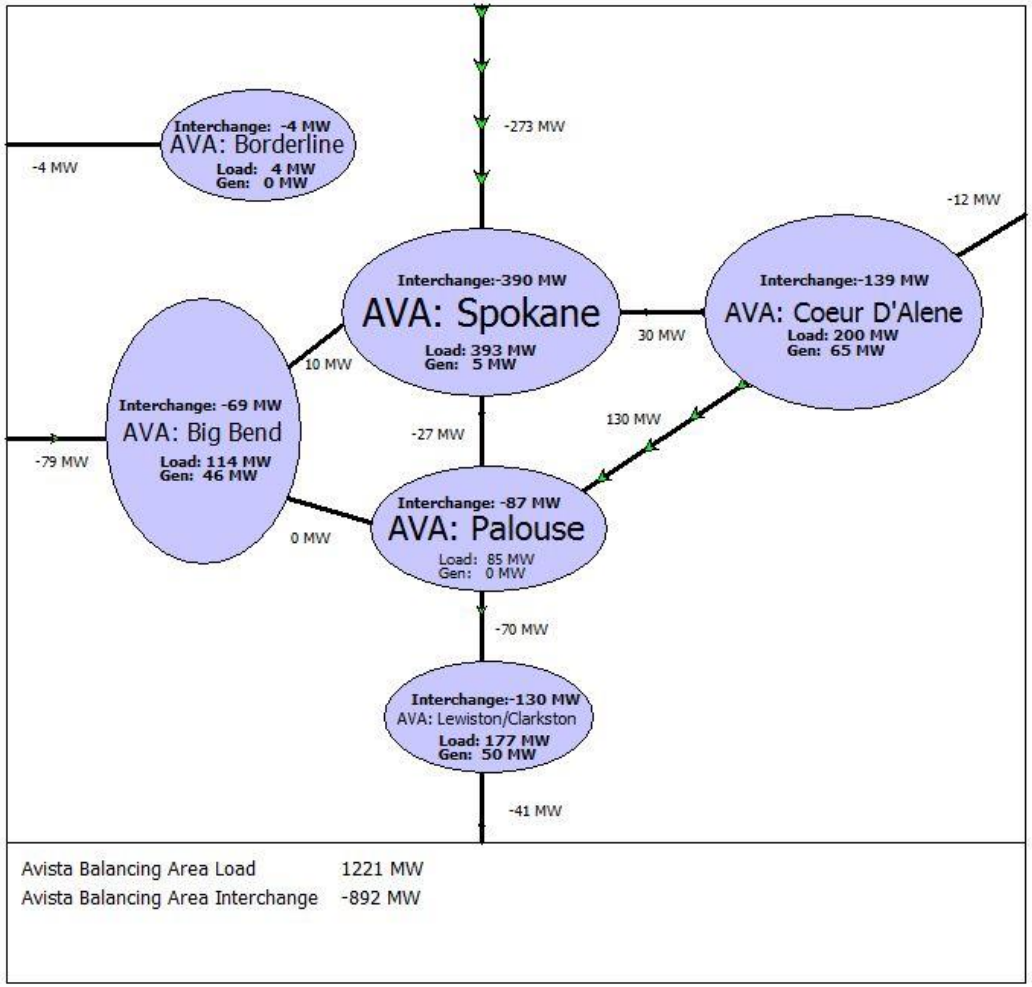
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED.

Stratford Strain Bus Replacement Project added

Generators set to Heavy Winter Dispatch



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WESTERN ELECTRICITY COORDINATING COUNCIL

2015 LS1 OPERATING CASE

DECEMBER 12 2014

[pre-title comments]

history file date Fri Dec 12 12:46:41 2014

present file date Fri Dec 12 12:53:48 2014

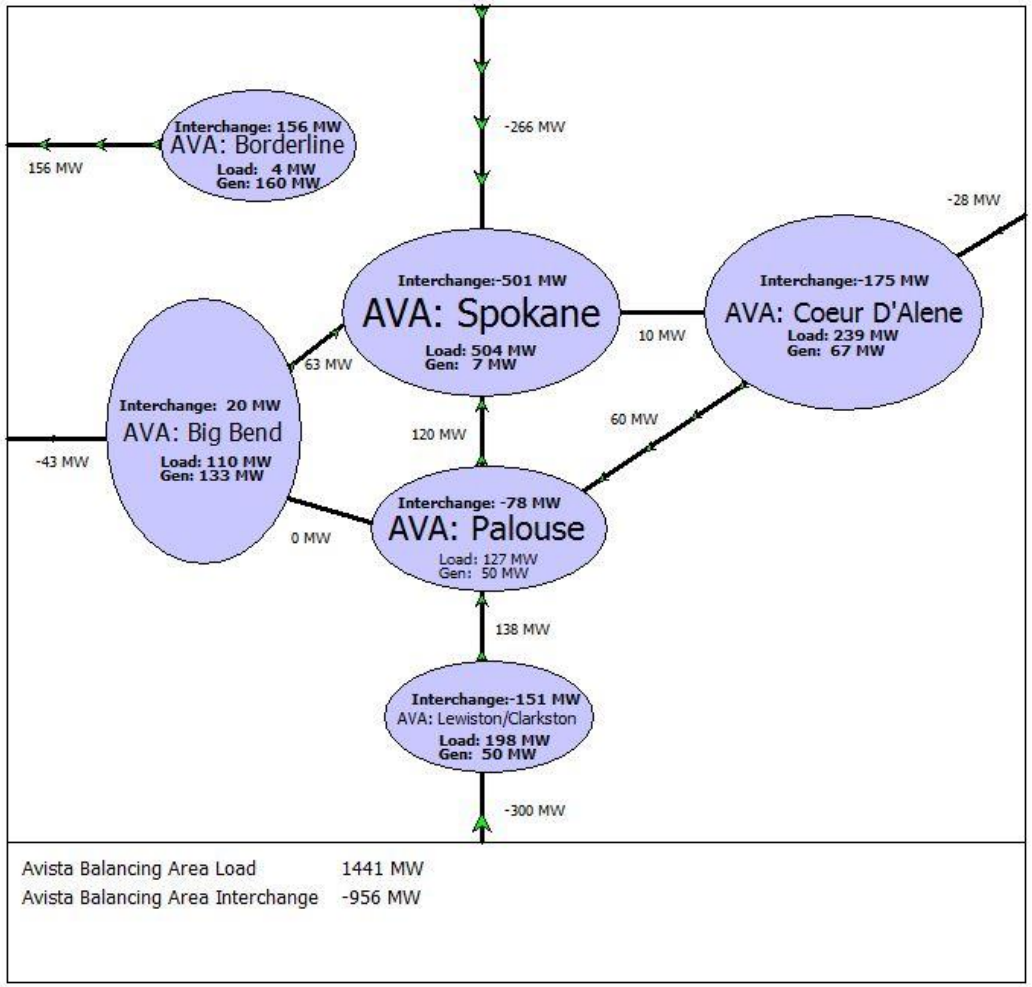
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED

Stratford Strain Bus Replacement Project added

Generators set to Light Summer Dispatch



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CASE HEADER: AVA-16lw1a-16BA1389.pwb

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WESTERN ELECTRICITY COORDINATING COUNCIL

2016 LW1A APPROVED OPERATING CASE

MAY 5, 2015

[pre-title comments]

history file date Tue May 05 10:30:11 2015

present file date Tue May 05 11:22:17 2015

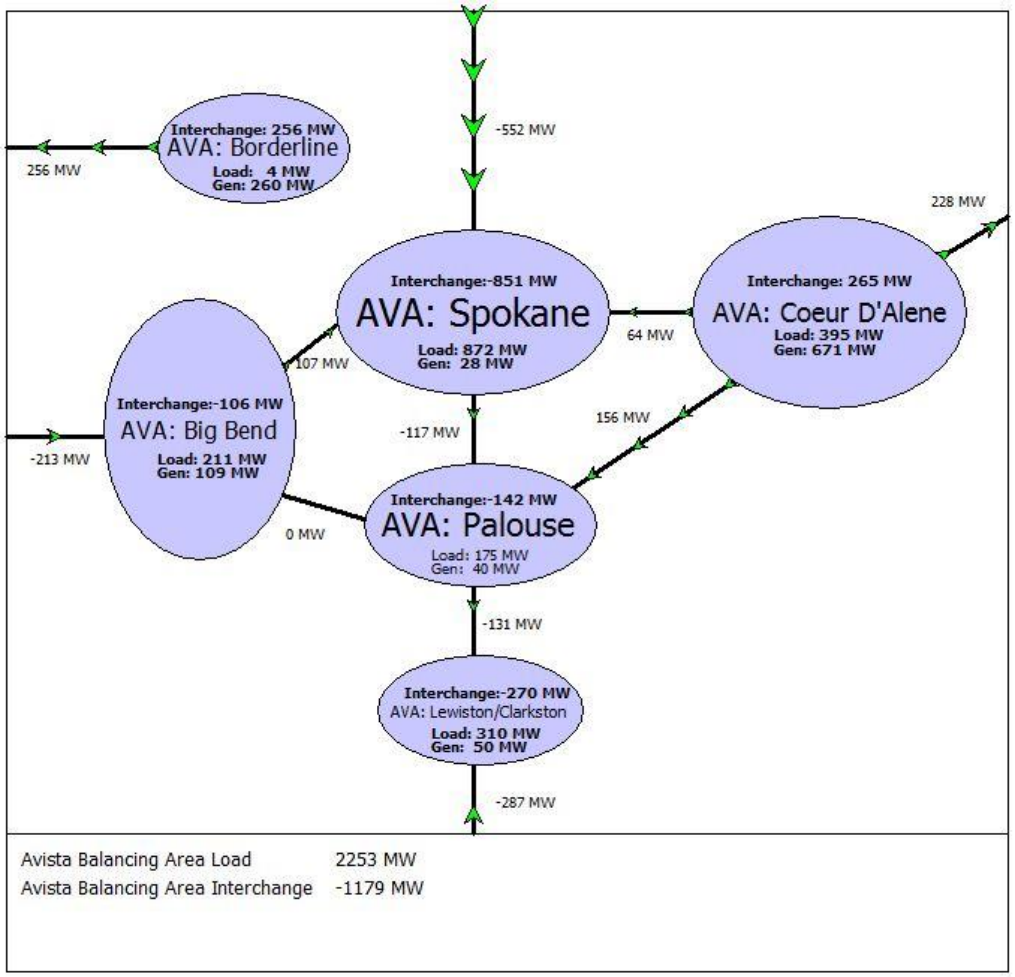
Version 18.1_02

[comments]

COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED

Stratford Strain Bus Replacement Project added

Generators set to Light Winter Dispatch



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CASE HEADER: AVA-20hs2a-20BA2183.pwb

WESTERN ELECTRICITY COORDINATING COUNCIL

2020 HEAVY SUMMER 2 PLANNING CASE

SEPTEMBER 23, 2014

[pre-title comments]

history file date Mon Sep 22 14:07:47 2014

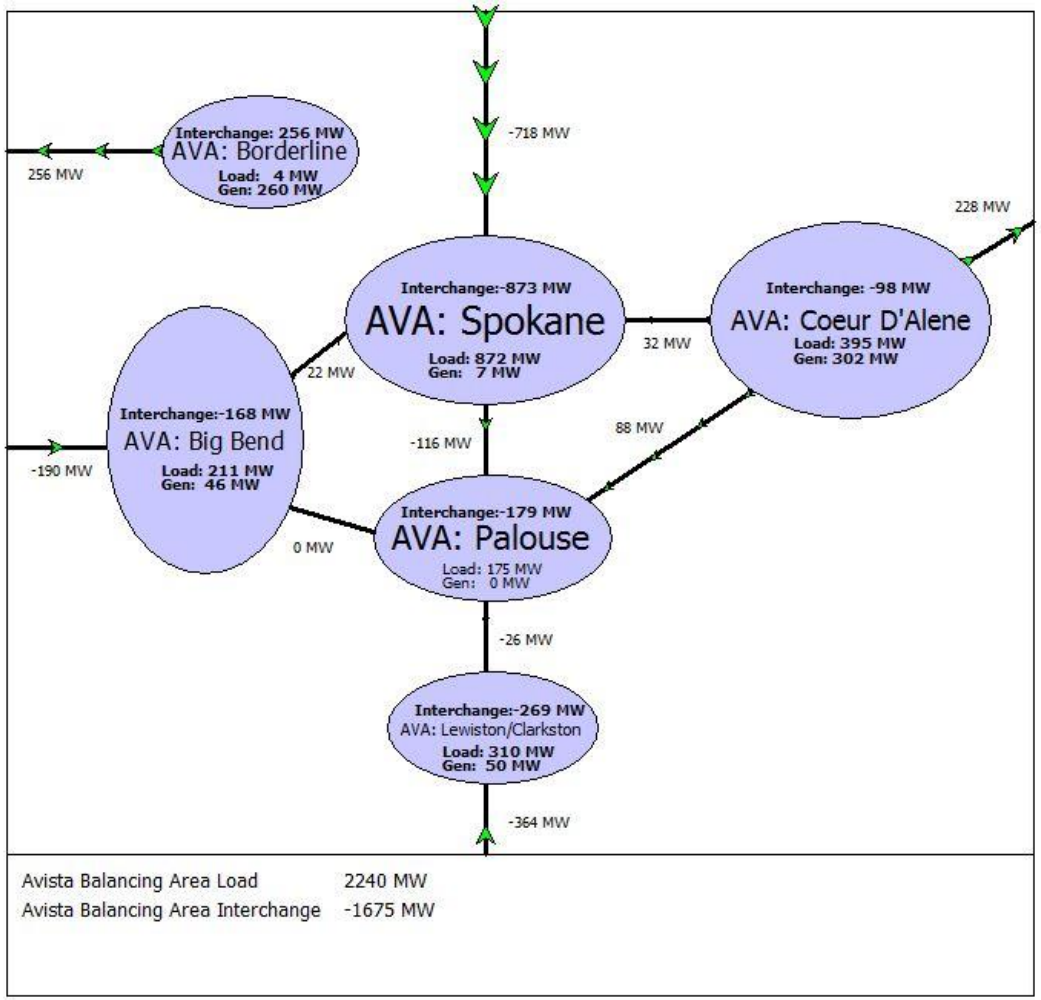
present file date Mon Sep 22 15:04:10 2014

Version 18.1_02

[comments]

Stratford Strain Bus Replacement Project added

Generators set to Heavy Summer Dispatch



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CASE HEADER: AVA-20hs2a-20BA2183-LH.pwb

WESTERN ELECTRICITY COORDINATING COUNCIL

2020 HEAVY SUMMER 2 PLANNING CASE

SEPTEMBER 23, 2014

[pre-title comments]

history file date Mon Sep 22 14:07:47 2014

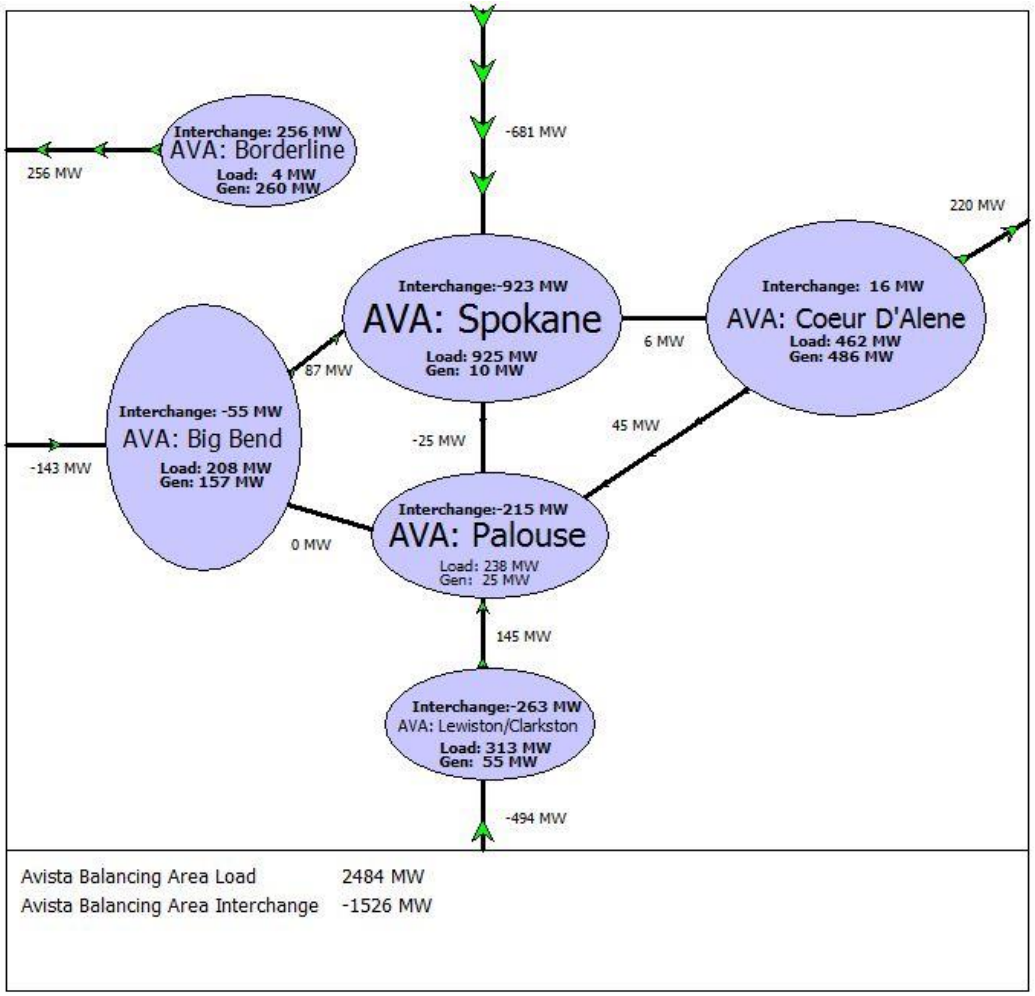
present file date Mon Sep 22 15:04:10 2014

Version 18.1_02

[comments]

Stratford Strain Bus Replacement Project added

Generators set to Heavy Summer Low Hydro Dispatch



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CASE HEADER: AVA-20hw1a-20BA2415.pwb

WESTERN ELECTRICITY COORDINATING COUNCIL

2019-20HW1 BASE CASE

JULY 31, 2014

[pre-title comments]

history file date Fri Jul 11 15:12:27 2014

present file date Fri Jul 11 15:12:39 2014

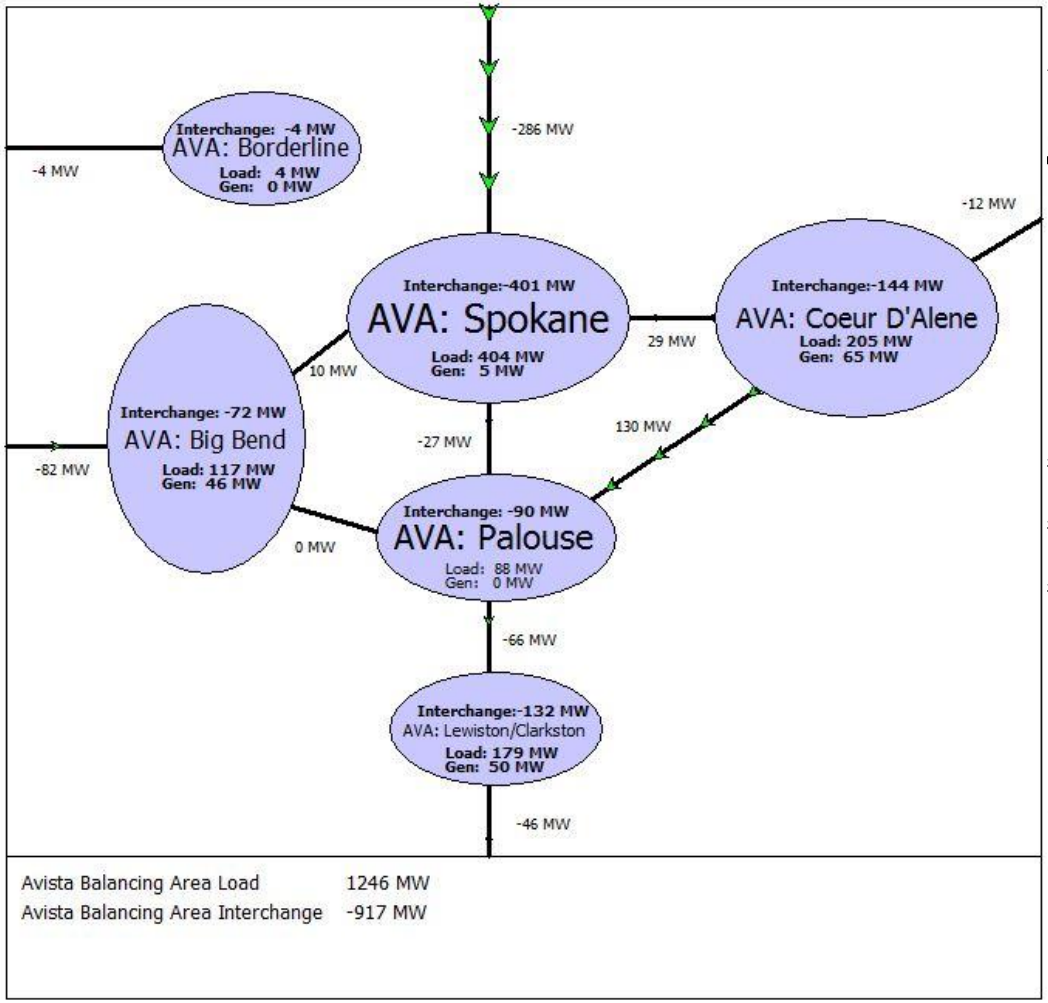
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS REVIEW ARE INCLUDED.

Stratford Strain Bus Replacement Project added

Generators set to Heavy Winter Dispatch



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CASE HEADER: AVA-15ls1a-20BA1185.pwb

WESTERN ELECTRICITY COORDINATING COUNCIL

2015 LS1 OPERATING CASE

DECEMBER 12 2014

[pre-title comments]

history file date Fri Dec 12 12:46:41 2014

present file date Fri Dec 12 12:53:48 2014

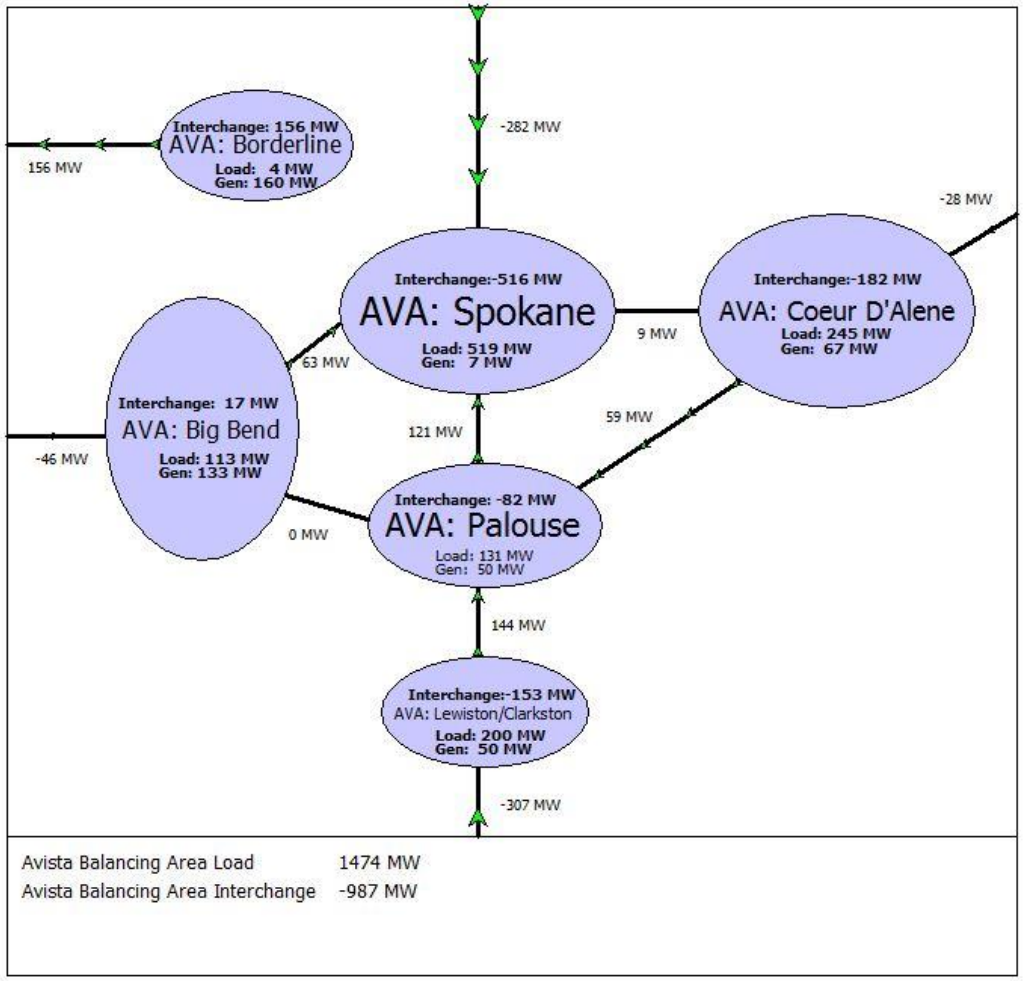
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED

Stratford Strain Bus Replacement Project added

Generators set to Light Summer Dispatch



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WESTERN ELECTRICITY COORDINATING COUNCIL

2016 LW1A APPROVED OPERATING CASE

MAY 5, 2015

[pre-title comments]

history file date Tue May 05 10:30:11 2015

present file date Tue May 05 11:22:17 2015

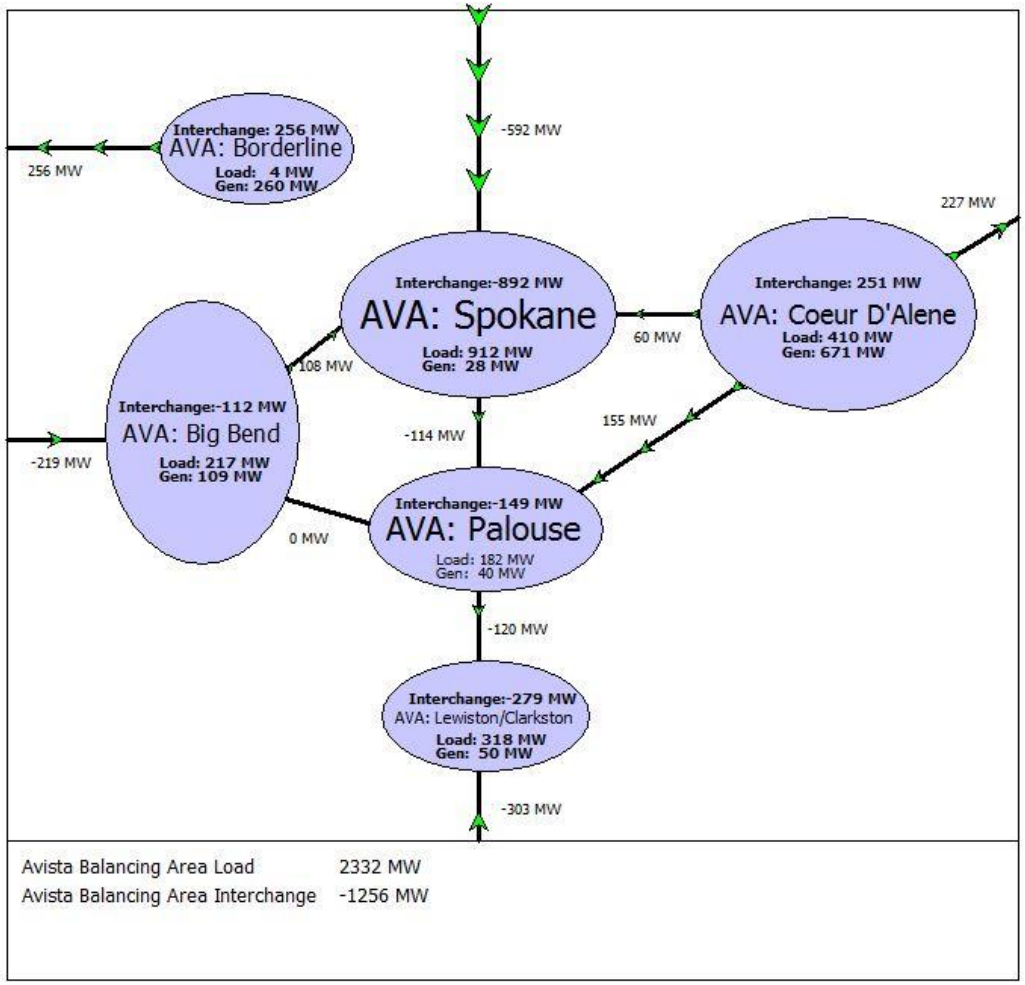
Version 18.1_02

[comments]

COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED

Stratford Strain Bus Replacement Project added

Generators set to Light Winter Dispatch



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WESTERN ELECTRICITY COORDINATING COUNCIL

2020 HEAVY SUMMER 2 PLANNING CASE

SEPTEMBER 23, 2014

[pre-title comments]

history file date Mon Sep 22 14:07:47 2014

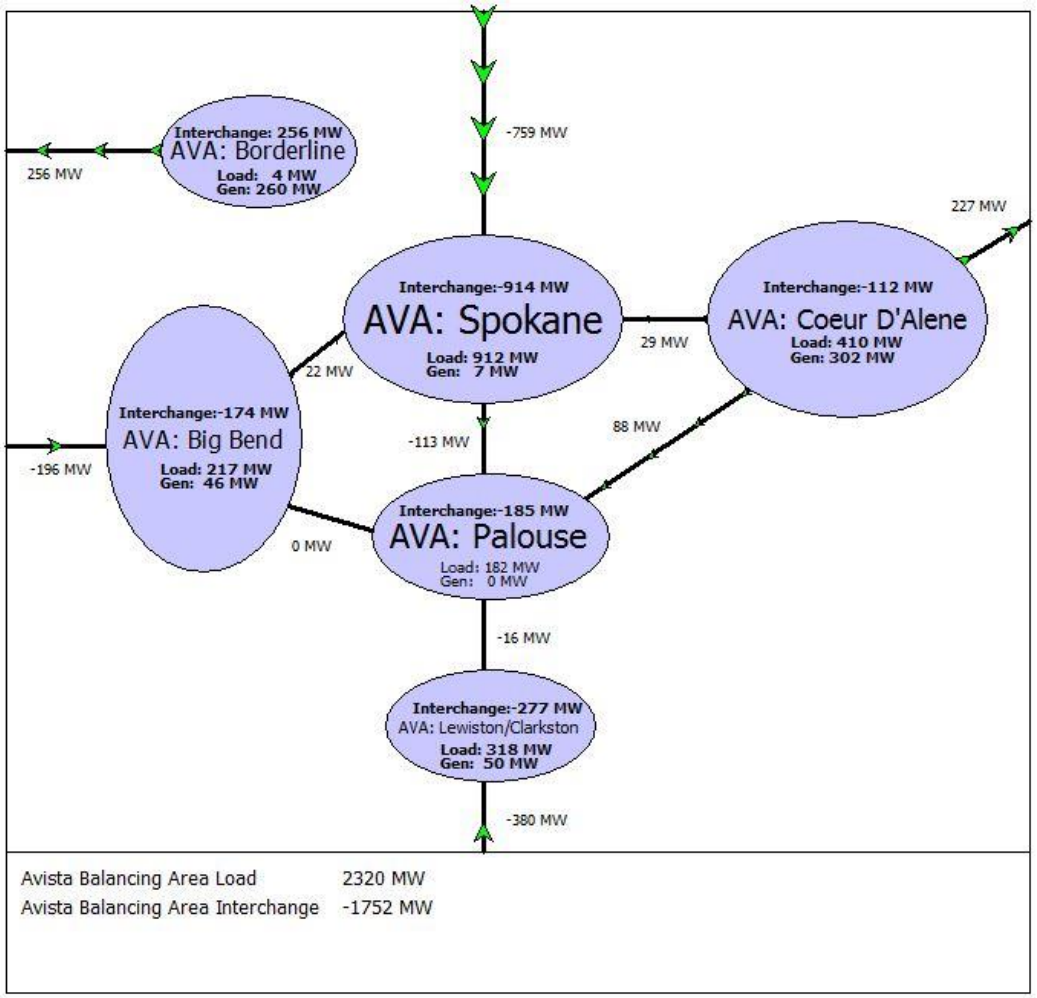
present file date Mon Sep 22 15:04:10 2014

Version 18.1_02

[comments]

Stratford Strain Bus Replacement Project added

Generators set to Heavy Summer Dispatch



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CASE HEADER: AVA-20hs2a-25BA2260-LH.pwb

WESTERN ELECTRICITY COORDINATING COUNCIL

2020 HEAVY SUMMER 2 PLANNING CASE

SEPTEMBER 23, 2014

[pre-title comments]

history file date Mon Sep 22 14:07:47 2014

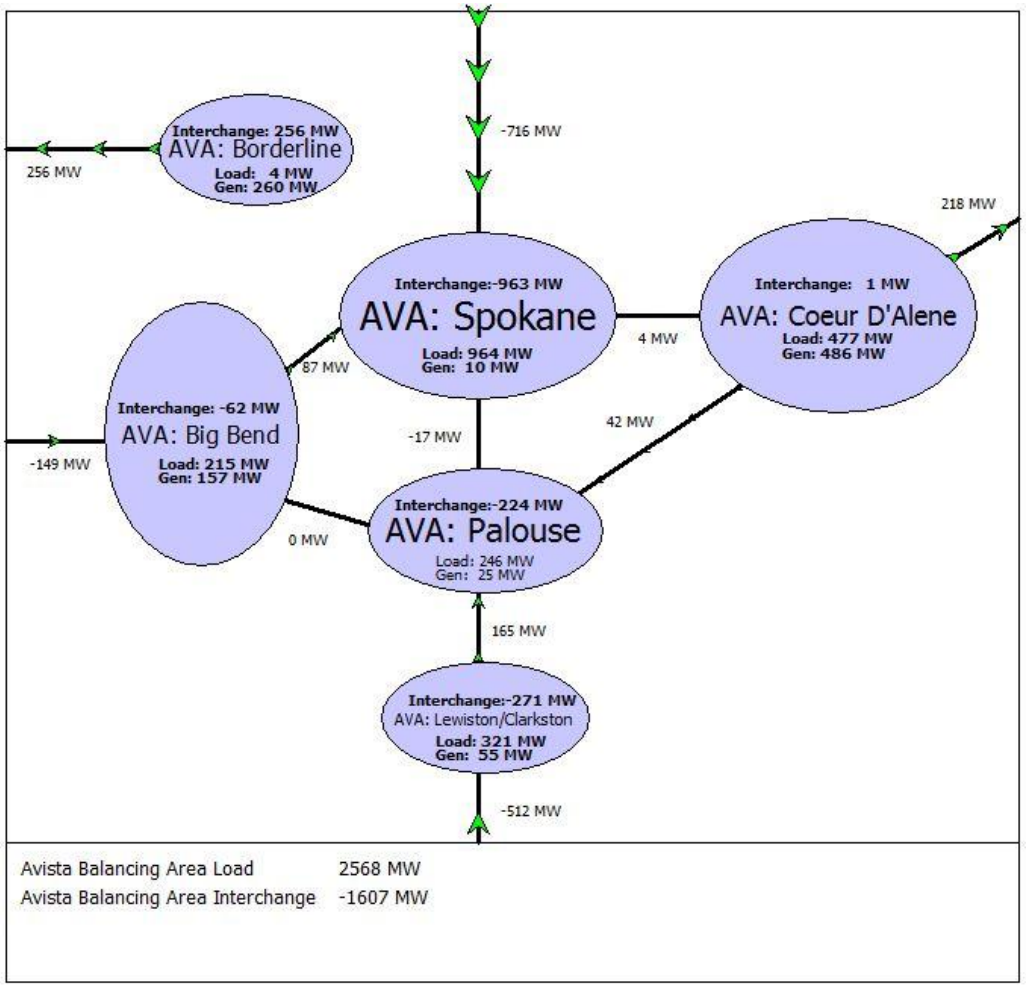
present file date Mon Sep 22 15:04:10 2014

Version 18.1_02

[comments]

Stratford Strain Bus Replacement Project added

Generators set to Heavy Summer Low Hydro Dispatch



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CASE HEADER: AVA-25hw1a-25BA2495.pwb

WESTERN ELECTRICITY COORDINATING COUNCIL

2019-20HW1 BASE CASE

JULY 31, 2014

[pre-title comments]

history file date Fri Jul 11 15:12:27 2014

present file date Fri Jul 11 15:12:39 2014

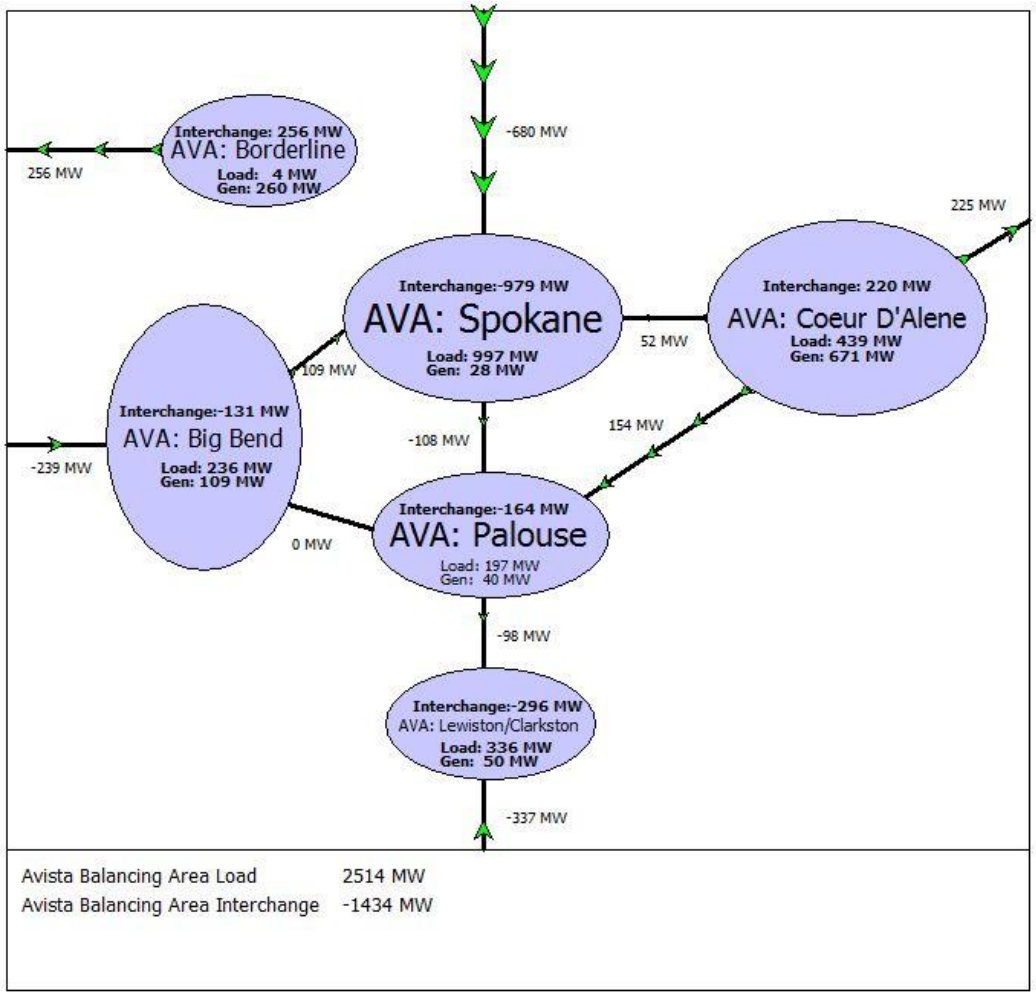
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS REVIEW ARE INCLUDED.

Stratford Strain Bus Replacement Project added

Generators set to Heavy Winter Dispatch



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CASE HEADER: AVA-20hs2a-35BA2423.pwb

WESTERN ELECTRICITY COORDINATING COUNCIL

2020 HEAVY SUMMER 2 PLANNING CASE

SEPTEMBER 23, 2014

[pre-title comments]

history file date Mon Sep 22 14:07:47 2014

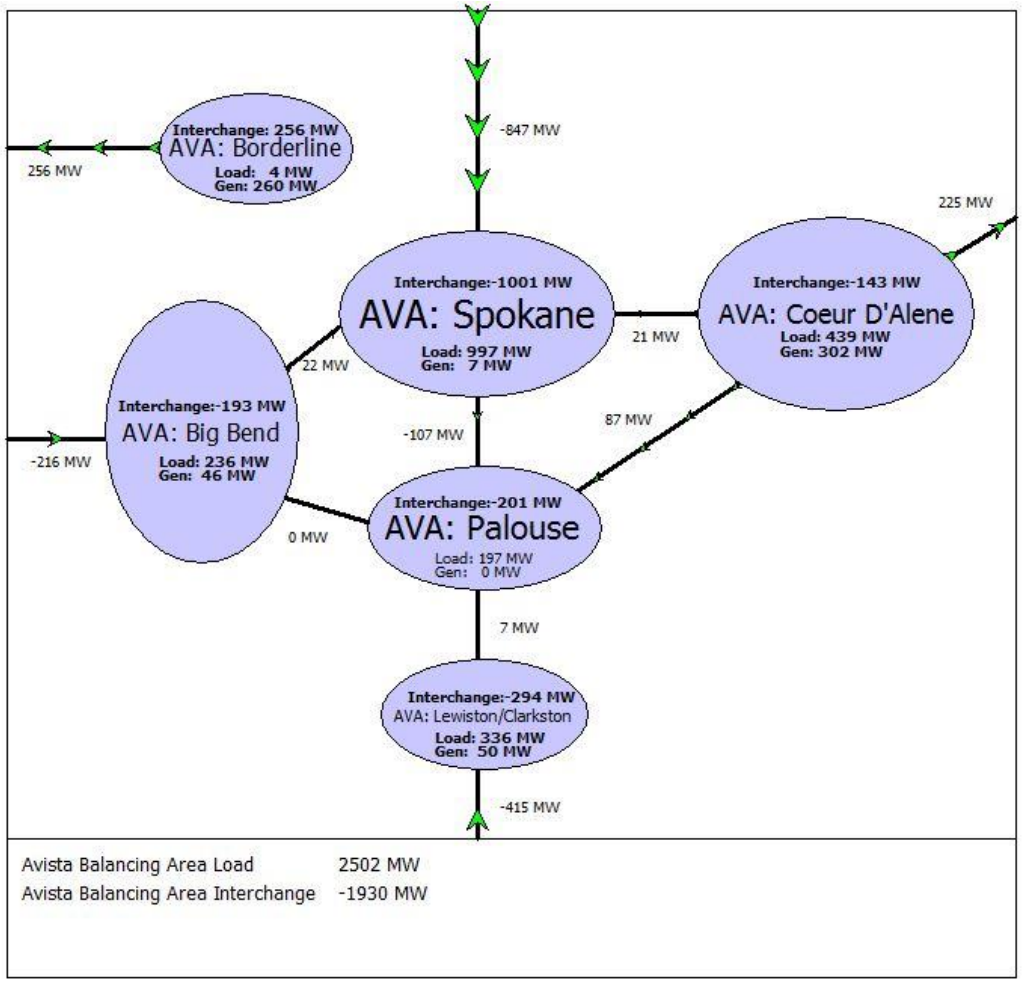
present file date Mon Sep 22 15:04:10 2014

Version 18.1_02

[comments]

Stratford Strain Bus Replacement Project added

Generators set to Heavy Summer Dispatch



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CASE HEADER: AVA-20hs2a-35BA2423-LH.pwb

WESTERN ELECTRICITY COORDINATING COUNCIL

2020 HEAVY SUMMER 2 PLANNING CASE

SEPTEMBER 23, 2014

[pre-title comments]

history file date Mon Sep 22 14:07:47 2014

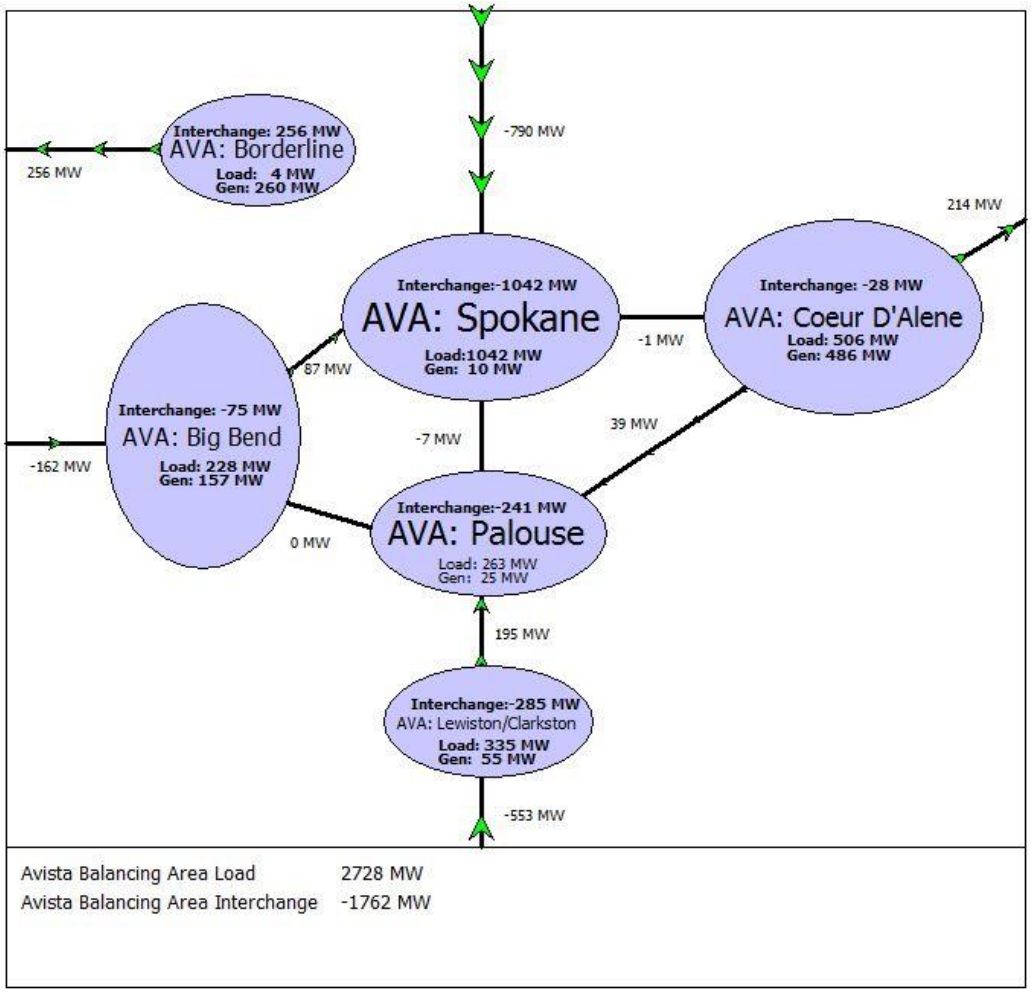
present file date Mon Sep 22 15:04:10 2014

Version 18.1_02

[comments]

Stratford Strain Bus Replacement Project added

Generators set to Heavy Summer Low Hydro Dispatch



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CASE HEADER: AVA-20hw1a-35BA2648.pwb

WESTERN ELECTRICITY COORDINATING COUNCIL

2019-20HW1 BASE CASE

JULY 31, 2014

[pre-title comments]

history file date Fri Jul 11 15:12:27 2014

present file date Fri Jul 11 15:12:39 2014

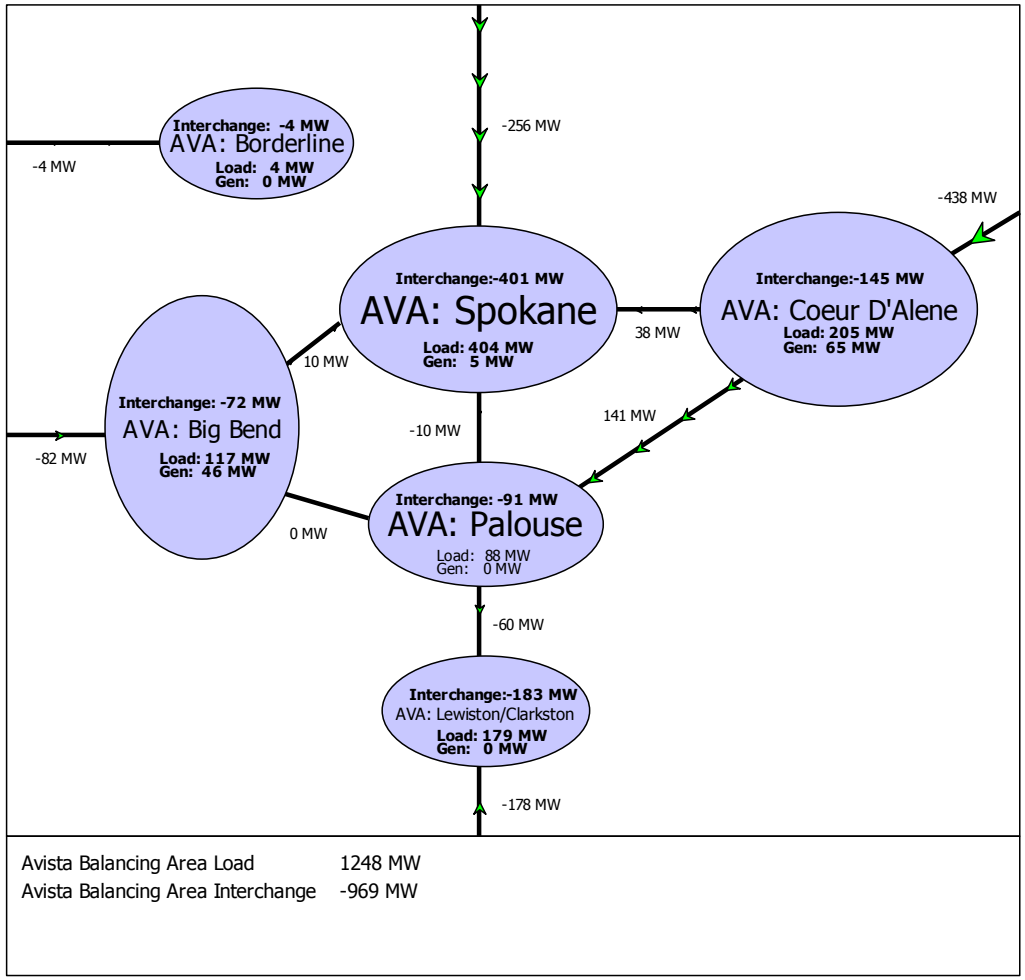
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS REVIEW ARE INCLUDED.

Stratford Strain Bus Replacement Project added

Generators set to Heavy Winter Dispatch



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CASE HEADER: 2020 IDtoNW Path14 E2W 2400.PWB

WESTERN ELECTRICITY COORDINATING COUNCIL

2015 LS1 OPERATING CASE

DECEMBER 12 2014

[pre-title comments]

history file date Fri Dec 12 12:46:41 2014

present file date Fri Dec 12 12:53:48 2014

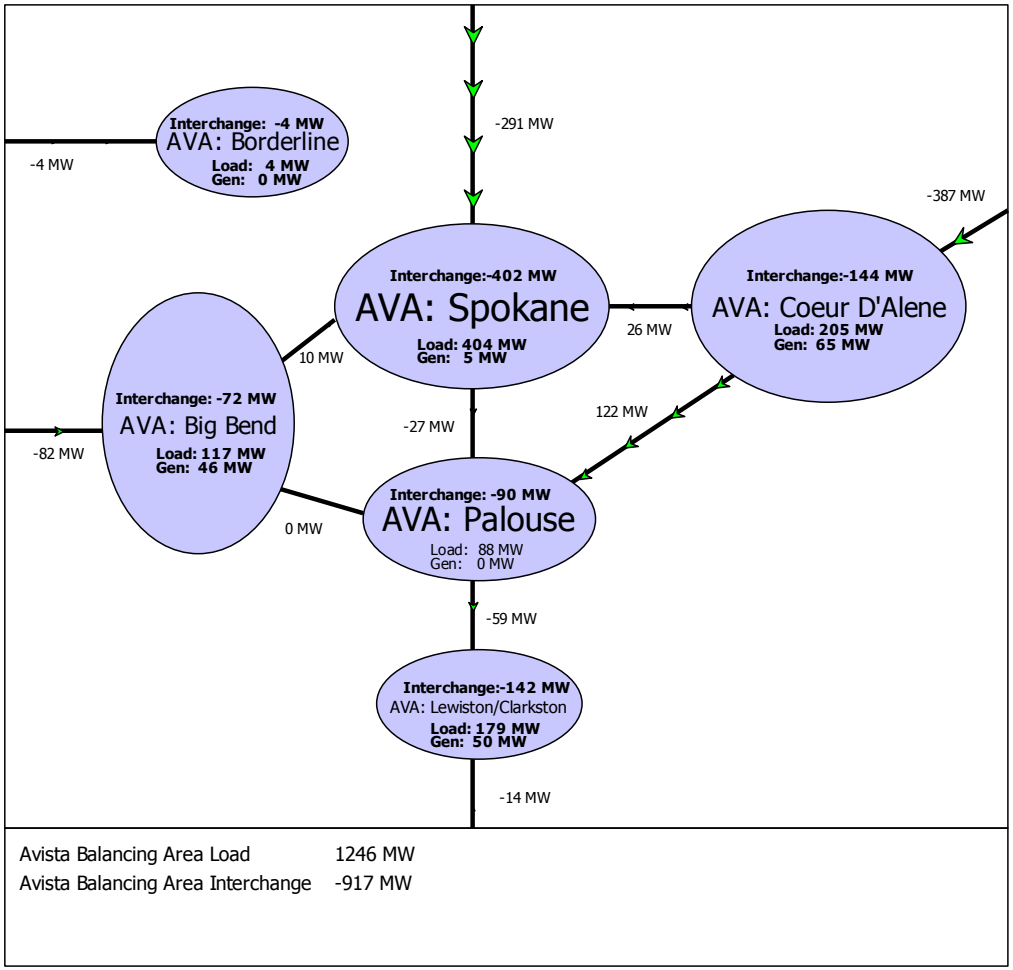
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED

Stratford Strain Bus Replacement Project added

Generators set to Light Summer Dispatch



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CASE HEADER: 2020 IDtoNW Path14 W2E 1200.PWB

WESTERN ELECTRICITY COORDINATING COUNCIL

2015 LS1 OPERATING CASE

DECEMBER 12 2014

[pre-title comments]

history file date Fri Dec 12 12:46:41 2014

present file date Fri Dec 12 12:53:48 2014

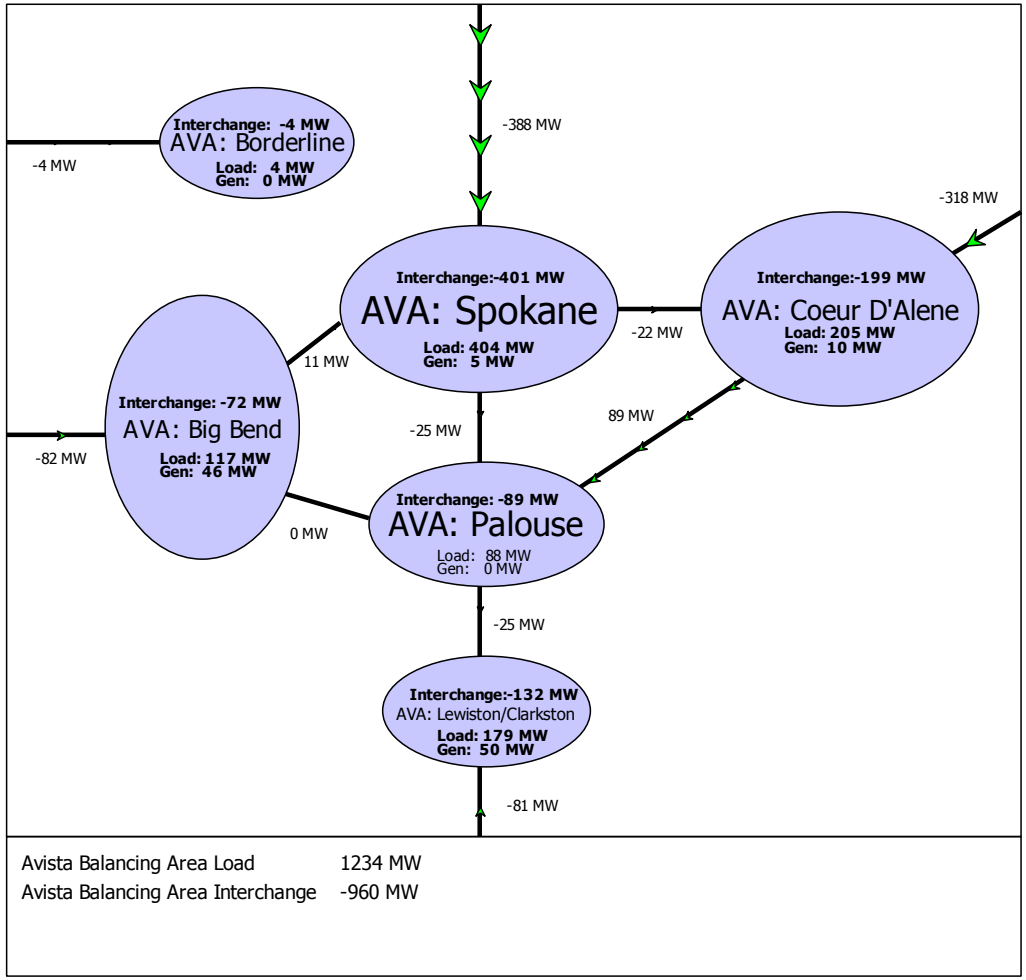
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED

Stratford Strain Bus Replacement Project added

Generators set to Light Summer Dispatch



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CASE HEADER: 2020 MTtoNW P8 E2W 2200.PWB

WESTERN ELECTRICITY COORDINATING COUNCIL

2015 LS1 OPERATING CASE

DECEMBER 12 2014

[pre-title comments]

history file date Fri Dec 12 12:46:41 2014

present file date Fri Dec 12 12:53:48 2014

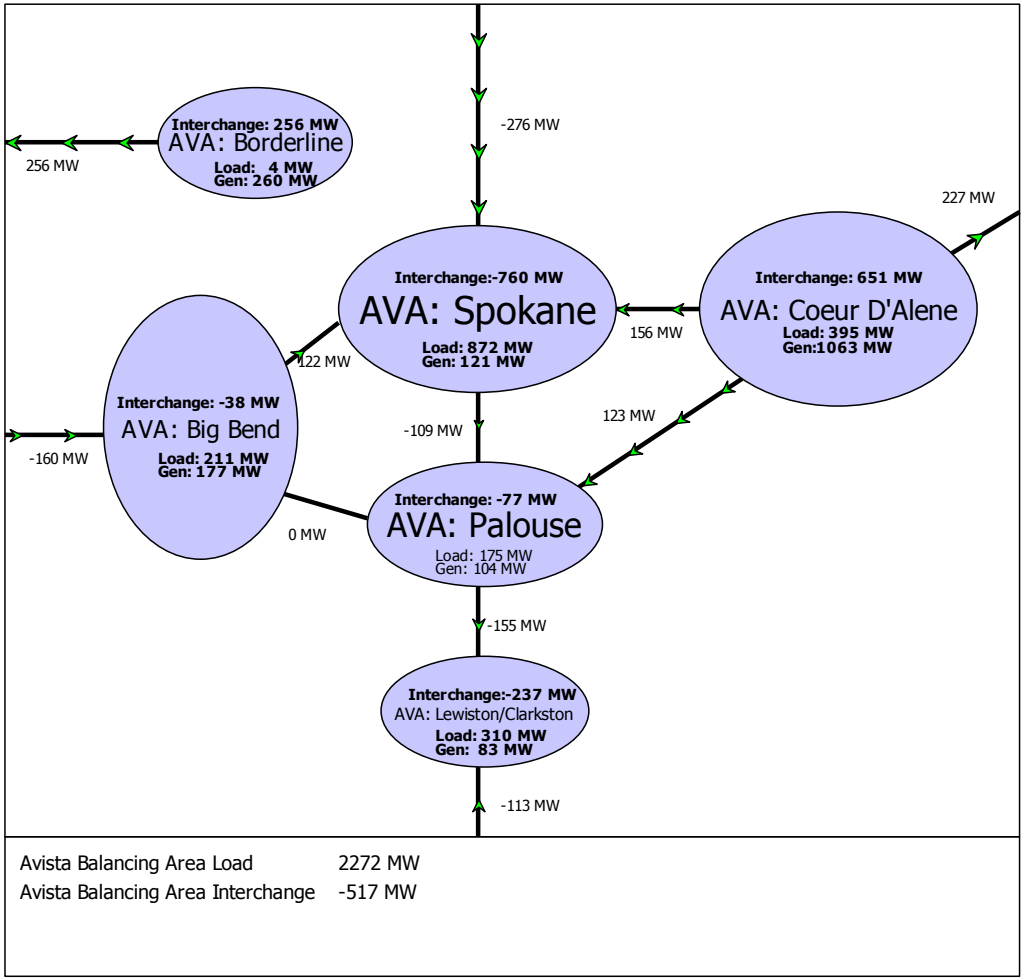
Version 18.1_02

[comments]

ALL COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED

Stratford Strain Bus Replacement Project added

Generators set to Light Summer Dispatch



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CASE HEADER: 2020 MTtoNW P8 W2E 1350.PWB

WESTERN ELECTRICITY COORDINATING COUNCIL

2020 HEAVY SUMMER 2 PLANNING CASE

SEPTEMBER 23, 2014

[pre-title comments]

history file date Mon Sep 22 14:07:47 2014

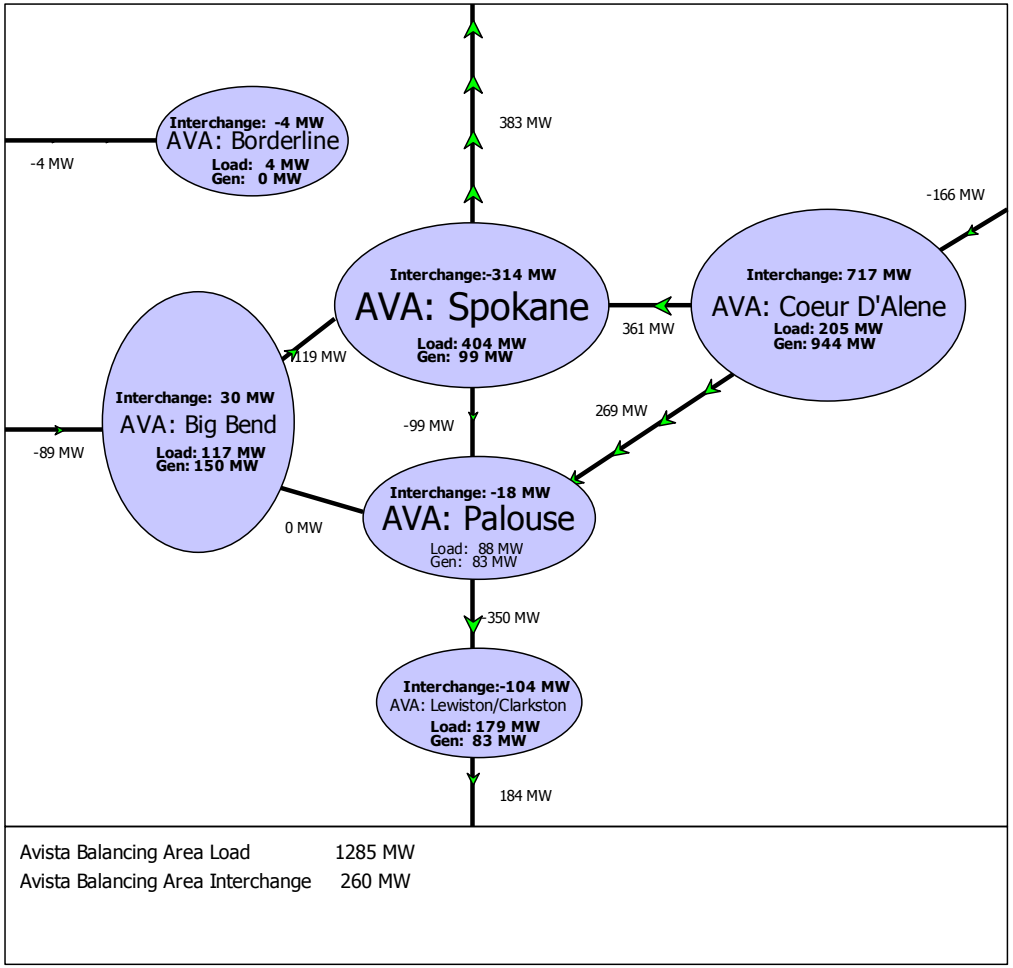
present file date Mon Sep 22 15:04:10 2014

Version 18.1_02

[comments]

Stratford Strain Bus Replacement Project added

Generators set to Heavy Summer Dispatch



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CASE HEADER: 2020 WoH P6 E2W 4250.PWB

WESTERN ELECTRICITY COORDINATING COUNCIL

2015 LS1 OPERATING CASE

DECEMBER 12 2014

[pre-title comments]

history file date Fri Dec 12 12:46:41 2014

present file date Fri Dec 12 12:53:48 2014

Version 18.1_02

[comments]

ALL COMMENTS FROM TSS AND OC REVIEW ARE INCLUDED

Stratford Strain Bus Replacement Project added

Generators set to Light Summer Dispatch

Stratford Strain Bus Replacement Project added

Ninth Central - Sunset Reconductor Project added

Benton - Othello SS Rebuild Project added

Spokane Valley Transmission Reinforcement Project added

Cabinet - Bronx - Sandcreek Rebuild Project added

Addy - Devils Gap Rebuild Project added

Noxon Reactor Project added

Coeur dAlene - Pine Creek Rebuild Project added

Created new Garden Springs Substation

Projects Modeled

The following is a list of the projects modeled in this Assessment within Avista's territory for the next 20 years, sorted by scheduled completion date.

Expected Projects

Project Name	Project Scope	Targeted Date of Operation
Chelan - Stratford River Crossing Rebuild Project	Rebuild the Columbia River crossing to 795ACSS to correct Chelan – Stratford line overload	2015
Odessa Capacitor Installation	Install two steps of 13.4 MVAR shunt capacitors for reactive support at Odessa Substation for added restoration capability	2015
Stratford Strain Bus Rebuild Project	Stratford strain bus replacement to relieve existing bottle neck on Stratford - Larson line within the Stratford Substation	2015
Ninth and Central – Sunset 115 kV Line Reconductoring	Reconductor 1.97 miles of limiting 250 CU conductor with 795AAC conductor with minimum thermal capacity rating of 150 MVA at 40C.	2016
Benton – Othello SS 115 kV Transmission Line Rebuild	Reconductor Avista's 26 mile section of the Benton – Othello Switching Station 115 kV Transmission Line with 795 ACSS with a minimum thermal capacity of 205MVA at 40C.	2016
Spokane Valley Transmission Reinforcement	A comprehensive project that includes: 1) Replace 4.37 miles of 556 AAC conductor with 150 MVA capacity or better conductor. 2) Rebuild Millwood, 20 MVA Transformers & 4 Feeders. Normally Open (SCADA controlled switch) provides Back-Up service for IEP Load. 3) New Irvin Switching Station, breaker & a half, 6 line termination with 2 future line terminations, distribution facilities per Distribution Engineering Group, one 33.5 MVAr capacitor bank with space for one future capacitor bank, 4) Replace 1.74 miles of 4/0 ACSR conductor with 150 MVA capacity or better conductor. 5) Convert Opportunity to a Switching Station (single bus, single breaker). 6) New 2.19 miles Single Circuit 150 MVA (IEP Tap). Possible double circuit with Irvin-Opportunity 115 kV Line.	2016
Addy – Devil's Gap 115 kV Transmission Line	Reconductor 5.19 miles (rebuild between Ford and Long Lake Tap) of limiting conductor which consist of 266.8 ACSR and 397.5 ACSR conductor resulting in a capacity limitation of 71.5 MVA at 40C, to be rebuilt to a capacity of 150 MVA at 40C	2017

Project Name	Project Scope	Targeted Date of Operation
Noxon Reactors Installation	Install two steps of 50 MVAR shunt reactors for reactive support at Odessa Substation for high voltages	2017
Sandcreek-Bronx-Cabinet Rebuild	Bronx - Cabinet Rebuild from Cabinet to Clark Fork with 795 ACSS	2017
Coeur d'Alene - Pine Creek 115 Rebuild	Coeur d'Alene - Pine Creek 115 Rebuild replace with 795 conductor and operate closed	2018
Hallett & White – Silver Lake 115 kV Transmission Line Rebuild	The transmission line will be rebuilt with 795 ACSR conductor with minimum thermal capacity of 150 MVA at 40C	2018
Westside Transformer phase 1	Westside Transformer Replacement Project includes a new 250 MVA Westside No.1 230/115 kV Transformer installation which was identified in the 2013 Planning Assessment to be implemented by 2018 for an N-1 contingency (Westside No.2 230/115 kV outage)	2018
Garden Springs 115 Station	Garden Springs 115 kV station -Loops the existing Airway Height - Sunset line into Garden Springs -Includes rebuild of Sunset - Westside from GDN to SUN with 795	2019
Roxboro-Warden Rebuild	The Lind – Warden 115 kV Transmission Line is 21 miles long, and is constructed primarily with 7#8 CU conductor resulting in a capacity limit of 57 MVA at 40C. Rebuild to 795 ACSS with aminimum of 150 MVA thermal capacity at 40C.	2020
Westside Transformer phase 2	Remove Westside Transformers 1 and 2 and replace with a new 250 MVA Transformer.	2020

Conceptual Projects

Project Name	Project Scope	Targeted Date of Operation
North Lewiston Reactors	Install new Reactors at North Lewiston 230 kV Substation	2016
Pine Creek 1 Transformer Replacement	Replace Pine Creek 1 230/115 kV Transformer	2017
Chelan - Stratford Transmission Line Rebuild	Chelan - Stratford 115kV line rebuild to 556 ACSR	2022
Beacon-FrancisCedar Reconductor	Reconductor 3/0 cu between Bell and Waikiki on Beacon - Francis and Cedar 115	2024

Project Name	Project Scope	Targeted Date of Operation
Bell Transformer No.7	New Bell Transformer No.7 230/115 kV Transformer with 250 MVA capacity	2024
Lolo Transformer Replacement	Replace Lolo 230/115 kV Transformers with 250 MVA capacity	2024
Ninth Central 230	Build new 230 kV Substation. Reconfigure line and build new line sections to obtain - Bell – Ninth and Central 230 kV Line - Beacon – Ninth and Central 230 kV Line	2024
Rathdrum - Westside 230 kV Transmission Line	Build new Transmission Line	2024
Shawnee Transformer No.2	Add new 230/115 kV Transformer with 250 MVA capacity	2025
South Lewiston SS	Install breakers at South Lewiston 115 kV to convert to a switching station	2025
Rathdrum 115 Bus Reconfiguration	Rathdrum 115 kV bus reconfiguration to eliminate tie breaker failure	2028
Garden Springs 230 Station	Adds 230 bus to Garden Springs and 250 MVA transformer New 230 line from Garden Springs to Westside with double circuiting of 115 lines	2030
Hatwai - Lolo 2 Transmission Line	Build new Transmission Line	2030
Silver Lake SS	Install breakers at Silver Lake 115 kV to convert to a switching station	2032
Garden Springs - Thornton 230 kV Transmission Line	Build new transmission line	2032
Beacon 230 kV Cap	Add 2 steps of 67.1 MVAr capacitor at Beacon 230	2034
Garden Springs - Ninth & Central 230 kV Transmission Line	Build new transmission line	2034

TABLE 2-1 PROJECTS MODELED IN BASECASE

APPENDIX B - STEADY STATE CONTINGENCY RESULTS

APPENDIX C - TRANSMISSION PLANNING STANDARDS, POLICIES, AND PROCEDURES

APPENDIX D - SCADA VARIABLE LIMITS

APPENDIX E - SYSTEM DATA BOOK