

2015 Electric Integrated Resource Plan

Appendix E – 2015 Electric IRP New Resource Table for Transmission



Appendix E

2015 Avista Electric IRP New Resource Table For Transmission Updated August 25, 2015

| Resource | Note | Resource Location | POR or Local Area | POD | Start | Stop | Capacity MW | Year Total |
|--------------|------|---------------------|-------------------|------------|-----------|------------|-------------|------------|
| Nine Mile | | Nine Mile Falls, WA | Nine Mile | AVA System | 4/1/2016 | Indefinite | 7.6 | 7.6 |
| SCCT | 1 | TBD | Mid-C/AVA System | AVA System | 10/1/2020 | Indefinite | 102.0 | 102.0 |
| Northeast | | Spokane, WA | Northeast | AVA System | 10/1/2023 | Indefinite | 7.5 | 7.5 |
| Kettle Falls | | Kettle Falls, WA | Kettle Falls | AVA System | 10/1/2024 | Indefinite | 12.0 | 12.0 |
| Rathdrum | | Rathdrum, WA | Rathdrum | AVA System | 10/1/2025 | Indefinite | 18.5 | 18.5 |
| CCCT | 1 | TBD | Mid-C/AVA System | AVA System | 10/1/2026 | Indefinite | 306.0 | 306.0 |
| SCCT | 1 | TBD | Mid-C/AVA System | AVA System | 10/1/2027 | Indefinite | 102.0 | 102.0 |
| Kettle Falls | | Kettle Falls, WA | Kettle Falls | AVA System | 10/1/2033 | Indefinite | 3.0 | 3.0 |
| SCCT | 1 | TBD | Mid-C/AVA System | AVA System | 10/1/2034 | Indefinite | 46.5 | 46.5 |

Total 605.1 605.1

Mid-Columbia Anticipated Contract Extensions

Mid-C contract extensions may replace or modify resources named above

| Resource | Note | Resource Location | POR or Local Area | POD | Start | Stop | Capacity MW | Year Total |
|-------------|------|-------------------|-------------------|------------|----------|------|-------------|------------|
| Rocky Reach | | Mid-C | Mid-C | AVA System | 1/1/2021 | TBD | 59.0 | |
| Rock Island | | Mid-C | Mid-C | AVA System | 1/1/2021 | TBD | 21.0 | 80.0 |
| Wells | | Mid-C | Mid-C | AVA System | 8/1/2018 | TBD | 28.0 | 28.0 |

Total 108.0 108.0

1 Modified POR to "Mid-C/AVA System" to reflect possibility of off-system SCCT integrated at Mid-C

Avista System Planning

2014 IRP Interconnection Study

Richard Maguire
Avista System Planning
November 25, 2014



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Introduction

Avista Utilities’ Integrated Resource Planning group requested preliminary estimates for the generation interconnections listed below. Avista’s System Planning Group conducted studies, and the results of those studies are summarized below and described in more detail throughout this report.

TABLE 1: SUMMARY ESTIMATES FOR GENERATION INTERCONNECTION REQUESTS

| Station | Request (MW) | POI Voltage | Cost Estimate (\$ million) ¹ |
|-----------------------|--------------|-------------|---|
| Kootenai County (New) | 100 | 230 kV | 12 - 16.1 |
| Kootenai County (New) | 350 | 230 kV | 47.2 |
| Rathdrum | 26 | 115 kV | 2.84 - 10.9 |
| Rathdrum | 50 | 115 kV | 10.7 – 18.7 |
| Rathdrum | 200 | 115 kV | 10.3 - 48.5 |
| Rathdrum | 50 | 230 kV | 7 – 16.8 |
| Rathdrum | 200 | 230 kV | 15.5 – 21.5 |
| Thornton | 30 | 230 kV | .4 |
| Thornton | 100 | 230 kV | .4 |
| Othello | 25 | 115 kV | 2 |
| Northeast | 10 | 115 kV | 0 |
| Kettle Falls | 10 | 115 kV | 0 |
| Long Lake | 68 | 115 kV | 19.7 |
| Monroe Street | 80 | 115 kV | 7 |
| Post Falls | 10 | 115 kV | 2.1 |
| Post Falls | 20 | 115 kV | 5.2 |

¹ Preliminary estimates are given as -25% to +75%

Study Methodology and Assumptions

Steady-state power flow analysis was performed for each request under the following conditions:

- Two Avista Planning Cases² were used for each request:
 - 2024 Heavy Summer – based on WECC 2024 HS1-S Base Case
 - 2019 High Transfer – rated West of Hatwai flow based on WECC 2014 LS1 Operating Case
- 737 contingency events were analyzed using select P1 – P7³ events
 - **Important Note:** cost estimates could be significantly increased by a more complete study that includes all P6 contingencies. A System Impact Study is necessary for more accurate cost estimates.
- Study case topology includes the Avista projects documented in [Appendix A](#)
- All existing generation local to each request was enabled at full output
- New generation was modeled using +/- 0.95 power factor
- PowerWorld's *Contingency Analysis* tool was used to determine only those facility violations that are new and caused by the requested generation. **This is different** from standard assessment presentations of contingency results, and the reader should keep this in mind when looking at study results.
- PowerWorld's *Available Transfer Capability (ATC) tool, not to be confused with the 'ATC' posted on Avista's OASIS*, was used to provide an indication of next-most-limiting facilities as the studied generator output was increased and the list of contingencies analyzed. This analysis was conducted for each request with the following settings:
 - Buyer modeled as all WECC generators except those within Avista's Balancing Authority Area
 - Ramping of modeled generation occurred in the pre-contingency state
 - Assumed reactive power did not change
 - ATC results cross-checked with standard contingency analysis
- Facility performance was measured against NERC Standards⁴ TPL-001-4 and FAC-010
 - Voltage performance not assessed during this study

² Avista Planning Cases are described in Avista Standards TP-SPP-04 Data Preparation and TP-SPP-06 Contingency Analysis

³ 'P' type Performance Planning Events described in NERC TPL-001-4

⁴ See <http://www.nerc.net/standardsreports/standardssummary.aspx>

| Category | Initial Condition | Event ¹ | Fault Type ² | BES Level ³ | Interruption of Firm Transmission Service Allowed ⁴ | Non-Consequential Load Loss Allowed |
|--|---|---|-------------------------|------------------------|--|-------------------------------------|
| P0 No Contingency | Normal System | None | N/A | EHV, HV | No | No |
| P1 Single Contingency | Normal System | Loss of one of the following: 1. Generator 2. Transmission Circuit 3. Transformer ⁵ 4. Shunt Device ⁶ | 3Ø | EHV, HV | No ⁹ | No ¹² |
| | | 5. Single Pole of a DC line | SLG | | | |
| P2 Single Contingency | Normal System | 1. Opening of a line section w/o a fault ⁷ | N/A | EHV, HV | No ⁹ | No ¹² |
| | | 2. Bus Section Fault | SLG | EHV | No ⁹ | No |
| | | | | HV | Yes | Yes |
| | | 3. Internal Breaker Fault ⁸ (non-Bus-tie Breaker) | SLG | EHV | No ⁹ | No |
| 4. Internal Breaker Fault (Bus-tie Breaker) ⁸ | SLG | HV | Yes | Yes | | |
| P3 Multiple Contingency | Loss of generator unit followed by System adjustments ⁵ | Loss of one of the following: 1. Generator 2. Transmission Circuit 3. Transformer ⁵ 4. Shunt Device ⁶ | 3Ø | EHV, HV | No ⁹ | No ¹² |
| | | 5. Single pole of a DC line | SLG | | | |
| P4 Multiple Contingency (Fault plus stuck breaker ¹⁰) | Normal System | Loss of multiple elements caused by a stuck breaker ¹⁰ (non-Bus-tie Breaker) attempting to clear a Fault on one of the following: 1. Generator 2. Transmission Circuit 3. Transformer ⁵ 4. Shunt Device ⁶ 5. Bus Section | SLG | EHV | No ⁹ | No |
| | | 6. Loss of multiple elements caused by a stuck breaker ¹⁰ (Bus-tie Breaker) attempting to clear a Fault on the associated bus | | HV | Yes | Yes |
| | | | SLG | EHV, HV | Yes | Yes |
| P5 Multiple Contingency (Fault plus relay failure to operate) | Normal System | Delayed Fault Clearing due to the failure of a non-redundant relay ¹³ protecting the Faulted element to operate as designed, for one of the following: 1. Generator 2. Transmission Circuit 3. Transformer ⁵ 4. Shunt Device ⁶ 5. Bus Section | SLG | EHV | No ⁹ | No |
| | | | | HV | Yes | Yes |
| P6 Multiple Contingency (Two overlapping singles) | Loss of one of the following followed by System adjustments ⁹ 1. Transmission Circuit 2. Transformer ⁵ 3. Shunt Device ⁶ 4. Single pole of a DC line | Loss of one of the following: 1. Transmission Circuit 2. Transformer ⁵ 3. Shunt Device ⁶ | 3Ø | EHV, HV | Yes | Yes |
| | | 4. Single pole of a DC line | SLG | EHV, HV | Yes | Yes |
| P7 Multiple Contingency (Common Structure) | Normal System | The loss of: 1. Any two adjacent (vertically or horizontally) circuits on common structure ¹¹ 2. Loss of a bipolar DC line | SLG | EHV, HV | Yes | Yes |

Analysis

Kootenai County

100 to 350 MW of generation was requested to be studied at a new station in Kootenai County near Post Falls, Idaho. This request was modeled as a new station approximately 2.5 electrical miles southwest of Rathdrum station on the Beacon – Rathdrum 230 kV Transmission Line (See Figure 1).

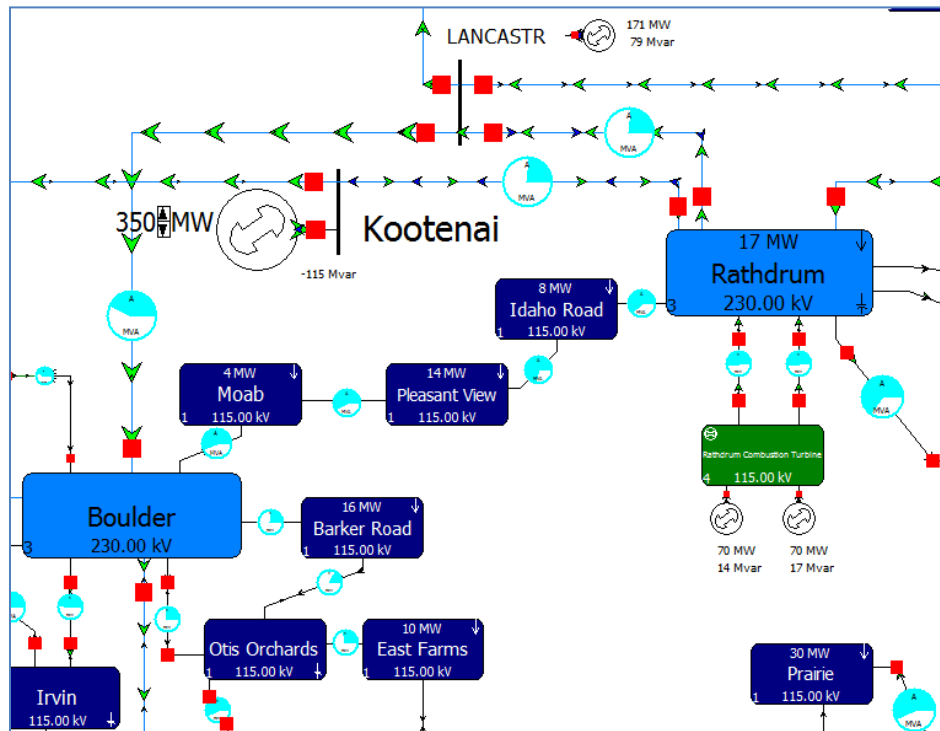


FIGURE 1: KOOTENAI STATION; 2024 HEAVY SUMMER SCENARIO

System performance in this area is dominated by several factors:

1. Inflow from the east on the Lancaster – Noxon and Cabinet – Rathdrum 230 kV transmission lines
2. Outflow to the west on the Bell – Lancaster, Boulder – Lancaster, and Beacon – Rathdrum 230 kV transmission lines
3. Load in the Coeur d’ Alene area served from Rathdrum Station
4. Generation (426 MW) locally from Lancaster, Rathdrum, Post Falls, and Boulder stations

In general, given the prevailing east-to-west flow of energy in the area under study, mitigating projects tend toward adding transmission capacity to the west, or to the south, or to both.

Kootenai 100 MW Request; \$16 to \$20.1 million

Analysis

For PO conditions, both study cases received generation up to 100 MW without issue.

For performance during contingencies, Table 2 shows results from the ATC analysis, and Table 3 shows Contingency Analysis results for new facility violations created by requested generation at 100 MW.

TABLE 2: ATC RESULTS; 100 MW OUTPUT

| Case | Trans Lim | Limiting Element | Limiting CTG | %OTDF |
|------|-----------|---|---|--------|
| hs | 19.79 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder #2 115 kV | 5.06 |
| ht | 25.46 | Line MOAB (47511) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | -4.9 |
| ht | 30.09 | Line BOULDERE (48522) TO IRVIN (48165) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder # 1115kV | 4.35 |
| ht | 35.85 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-1 Opportunity - Otis Orchards 115 kV Open @ OTI | 3.55 |
| ht | 36.2 | Line EASTFARM (48117) TO POST FLS (48329) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -7.6 |
| hs | 45.15 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -9.51 |
| ht | 54.6 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-1 Beacon - Boulder 230 kV | 4.1 |
| ht | 63.74 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder # 1230/115 Transformer | -4.9 |
| ht | 64.84 | Line BENEWAH (48037) TO PINE CRK (48317) CKT 1[230.00 - 230.00 kV] | BF: A290 Hot Springs 230 kV, Hot Springs-Rattlesnake | -3.95 |
| ht | 65.04 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | BUS: Beacon North 230 kV | 4.69 |
| ht | 69.54 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | N-1 Boulder - Lancaster 230 kV | -5.08 |
| hs | 76.6 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -9.51 |
| ht | 78.81 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | -10.49 |
| ht | 80.77 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | -7.22 |
| ht | 88.71 | Line EASTFARM (48117) TO OTIS (48311) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | 7.6 |
| ht | 89.08 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | -4.9 |
| hs | 105.53 | Line IRVIN (48165) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | BF: R427 Beacon North & South 230 kV | -7.56 |

TABLE 3: CONTINGENCY RESULTS; 100 MW OUTPUT

| Element | Label | Percent | Case |
|--|--|---------|------|
| PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | 110.24 | hs |
| BELLAN11(90011) -> BELL S3 (40090) CKT 1 at BELLAN11 | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | 107.47 | ht |
| MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | 106.63 | hs |
| PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | N-1 Boulder - Lancaster 230 kV | 105.68 | ht |
| PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | BF: R554 Boulder-Lancaster, Boulder # 1230/115 Transformer | 105.42 | ht |
| POST FLS (48329) -> EASTFARM (48117) CKT 1 at POST FLS | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | 105.08 | ht |
| PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | 104.69 | ht |
| BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at SPKINDPK | N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder #2 115 kV | 103.12 | hs |
| BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at SPKINDPK | N-2 (ADJ): Beacon - Boulder #2 115 kV and Beacon - Ninth & Central #2 115 kV | 102.77 | hs |
| MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | N-1 Boulder - Lancaster 230 kV | 102.64 | ht |
| BOULDERE (48522) -> IRVIN (48165) CKT 1 at BOULDERE | N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder # 1115kV | 102.57 | ht |
| MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | BF: R554 Boulder-Lancaster, Boulder # 1230/115 Transformer | 102.41 | ht |
| BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | N-1 Opportunity - Otis Orchards 115 kV Open @ OTI | 102.17 | ht |
| RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | 101.82 | hs |
| BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | N-1 Beacon - Boulder 230 kV | 101.75 | ht |
| MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | 101.65 | ht |
| BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | BUS: Beacon North 230 kV | 101.53 | ht |
| SPKINDPK (48405) -> IRVIN (48165) CKT 1 at IRVIN | BF: R427 Beacon North & South 230 kV | 101.47 | hs |
| IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | 101.18 | ht |
| BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | 100.87 | ht |
| EASTFARM (48117) -> OTIS (48311) CKT 1 at EASTFARM | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | 100.58 | ht |
| OPPORTUN (48299) -> CHESTER (48069) CKT 1 at CHESTER | BF: A600 Beacon North & South 115 kV | 100.2 | hs |



Figure 2 shows system performance during the highest overload contingency noted in Table 3. Figure 2 provides a fairly accurate depiction of issues in the area as power flows on the underlying 115 kV system for some single or double-circuit outage on the east-west 230 kV system.

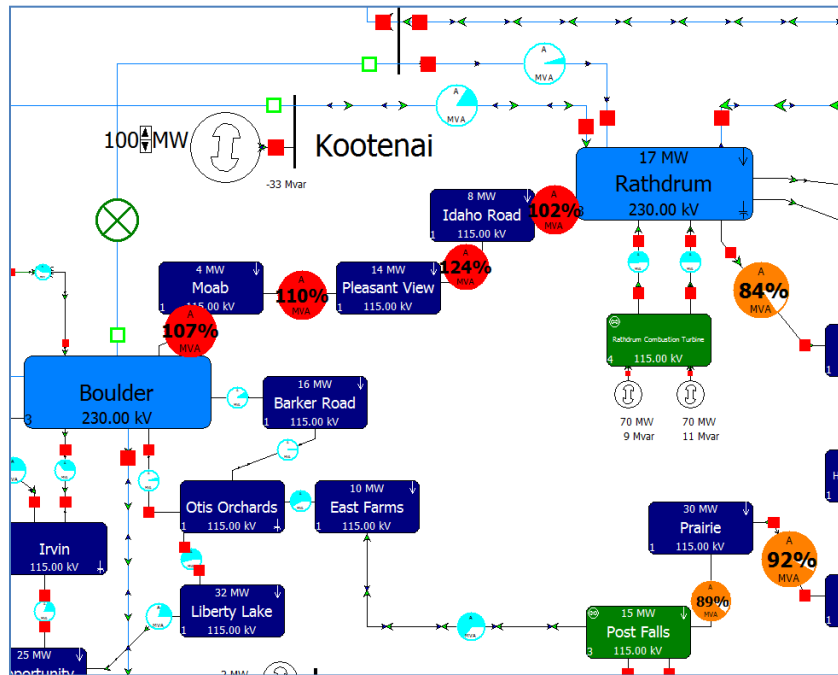


FIGURE 2: WORST INCREMENTAL PERFORMANCE DURING CONTINGENCIES; HEAVY SUMMER CASE; 100 MW REQUEST

Project Alternatives

1. Point of Interconnection (POI)
 - a. New 3 position Double Bus Double Breaker station (Kootenai); \$4 million
2. Project options necessary to mitigate new facility violations
 - a. Back-tripping with transmission line upgrades:
 - i. Implement the back-tripping scheme currently described in Avista’s 2013 Local Planning Report⁵ for an estimated \$400,000
 - ii. Upgrade 27.6 miles of 115 kV transmission lines to a minimum summer rating of 132 MVA for an estimated \$11.6 million.
 - b. Transmission line upgrades without back-tripping:
 - i. Upgrading 38 miles of 115 kV transmission line to a minimum summer rating of 132 MVA for an estimated \$16 million
 - ii. Upgrade 0.1 miles of the BPA Bell – Lancaster 230 kV Transmission Line to a summer rating of 800 MVA for an estimated \$100,000

⁵ http://www.oasis.oati.com/AVAT/AVATdocs/2013_Avista_System_Planning_Assessment_-_Rev_0.pdf; Page 108



Kootenai 350 MW request; \$47.2 million

Analysis

For PO conditions, both study cases received generation up to 350 MW without issue. Table 4 shows results from the ATC analysis, and [Appendix B](#) shows Contingency Analysis results for new facility violations created by the requested generation.

TABLE 4: ATC RESULTS; 350 MW OUTPUT

| ID | Case | Trans Lim | Limiting Element | Limiting CTG | % OTDF |
|-----|------|-----------|---|---|--------|
| 197 | hs | 19.79 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder #2 115 kV | 5.06 |
| 57 | ht | 25.46 | Line MOAB (47511) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | -4.9 |
| 56 | ht | 30.09 | Line BOULDERE (48522) TO IRVIN (48165) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder #1 115kV | 4.35 |
| 55 | ht | 35.85 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-1 Opportunity - Otis Orchards 115 kV Open @ OTI | 3.55 |
| 54 | ht | 36.2 | Line EASTFARM (48117) TO POST FLS (48329) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -7.6 |
| 196 | hs | 45.15 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -9.51 |
| 53 | ht | 54.6 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-1: Beacon - Boulder 230 kV | 4.1 |
| 52 | ht | 63.74 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder #1230/115 Transformer | -4.9 |
| 51 | ht | 64.84 | Line BENEWAH (48037) TO PINE CRK (48317) CKT 1[230.00 - 230.00 kV] | BF: A290 Hot Springs 230 kV, Hot Springs-Rattlesnake | -3.95 |
| 50 | ht | 65.04 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | BUS: Beacon North 230 kV | 4.69 |
| 49 | ht | 69.54 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | N-1: Boulder - Lancaster 230 kV | -5.08 |
| 195 | hs | 76.6 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -9.51 |
| 48 | ht | 78.81 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | BF: A184 Lancaster-Noxon, Lancaster-Rathdrum | -10.49 |
| 47 | ht | 80.77 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | -7.22 |
| 46 | ht | 88.71 | Line EASTFARM (48117) TO OTIS (48311) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | 7.6 |
| 45 | ht | 89.08 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | -4.9 |
| 44 | ht | 90 | Line BENEWAH (48037) TO PINE CRK (48317) CKT 1[230.00 - 230.00 kV] | BF: A286 Hot Springs 230 kV, Flathead-Hot Springs | -3.82 |
| 194 | hs | 105.53 | Line IRVIN (48165) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | BF: R427 Beacon North & South 230 kV | -7.56 |
| 43 | ht | 113.23 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | BF: A184 Lancaster-Noxon, Lancaster-Rathdrum | -8.68 |
| 42 | ht | 118.15 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: A388 Bell S2 & S3 230 kV | 3.9 |
| 193 | hs | 120.3 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV | 5.95 |
| 41 | ht | 132.66 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: A1561 Boulder-Lancaster, Lancaster Generator #1 & #2 | 5.08 |
| 40 | ht | 134.68 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | N-1: Lancaster - Rathdrum 230 kV | 10.28 |
| 192 | hs | 135.44 | Line CHESTER (48069) TO OPPORTUN (48299) CKT 1[115.00 - 115.00 kV] | BF: A600 Beacon North & South 115 kV | -4.01 |
| 39 | ht | 135.9 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Bell - Taft 500 kV and Bell - Lancaster 230 kV | -3.94 |
| 38 | ht | 137.3 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: A186 Lancaster-Noxon, Boulder-Lancaster | 5.29 |
| 37 | ht | 145.41 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | PSF: Ramsey 115 kV | 3.98 |
| 36 | ht | 146.75 | Line MOAB (47511) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: A186 Lancaster-Noxon, Boulder-Lancaster | -5.29 |
| 35 | ht | 148.64 | Line MOAB (47511) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: A184 Lancaster-Noxon, Lancaster-Rathdrum | -10.5 |
| 191 | hs | 170.76 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Boulder 230 kV & Beacon - Kootenai 230 kV | 8.62 |
| 34 | ht | 173.9 | Line PRAIRIEB (40855) TO RAM SEY (48349) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | -6.1 |
| 33 | ht | 180.38 | Line BENEWAH (48037) TO PINE CRK (48317) CKT 1[230.00 - 230.00 kV] | BF: A288 Hot Springs 230 kV, Hot Springs-Noxon Rapids #1 | -3.82 |
| 32 | ht | 182.63 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | N-1: Boulder - Lancaster 230 kV | -4.14 |
| 31 | ht | 185.51 | Line BENEWAH (48037) TO PINE CRK (48317) CKT 1[230.00 - 230.00 kV] | BUS: Hot Springs 230 kV | -3.82 |
| 30 | ht | 194.18 | Line EASTFARM (48117) TO POST FLS (48329) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | -5.42 |
| 29 | ht | 199.14 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BF: A184 Lancaster-Noxon, Lancaster-Rathdrum | -10.49 |
| 28 | ht | 204.71 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | -3.99 |
| 27 | ht | 207.05 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder #1230/115 Transformer | -3.99 |
| 190 | hs | 220.28 | Line HUETTER (48159) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BF: A506 Rathdrum 115 kV, Pine Street-Rathdrum | -4.11 |
| 189 | hs | 221.52 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder #1230/115 Transformer | 5.19 |
| 188 | hs | 221.85 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | 5.19 |
| 187 | hs | 224.66 | Line HUETTER (48159) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BUS: Rathdrum East 115 kV | -4.11 |
| 186 | hs | 229.41 | Line PRAIRIEB (40855) TO RAM SEY (48349) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -8 |
| 185 | hs | 250.4 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -8 |
| 184 | hs | 251.35 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | N-1: Boulder - Lancaster 230 kV | 5.37 |
| 26 | ht | 254.81 | Line PRAIRIEB (40855) TO RAM SEY (48349) CKT 1[115.00 - 115.00 kV] | BF: A184 Lancaster-Noxon, Lancaster-Rathdrum | -8.68 |
| 25 | ht | 285.24 | Line BELL S3 (40090) TO BELCOU31(90012) CKT 3 [230.00 - 230.00 kV] | N-2 (ADJ): Bell - Coulee #6 500kV and Coulee - Westside 230kV | 8.91 |
| 24 | ht | 285.53 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | BF: A186 Lancaster-Noxon, Boulder-Lancaster | -4.26 |
| 23 | ht | 295.13 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | N-1: Boulder - Lancaster 230 kV | -5.08 |
| 22 | ht | 299.48 | Line EASTFARM (48117) TO OTIS (48311) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | 5.42 |
| 21 | ht | 320.34 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | -4.9 |
| 20 | ht | 321.03 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder #1230/115 Transformer | -4.9 |
| 19 | ht | 343.98 | Line HATWAI (40519) TO MOSCOW (48249) CKT 1[230.00 - 230.00 kV] | BF: 4652 Dworshak-Taft, Dworshak-Hatwai, Dworshak 500 kV Switched Shunt | -7.55 |
| 18 | ht | 345.85 | Line BELLAN11(90011) TO LANCASTR (40624) CKT 1[230.00 - 230.00 kV] | BF: R427 Beacon North & South 230 kV | -32.19 |
| 17 | ht | 346.31 | Line BELLAN11(90011) TO LANCASTR (40624) CKT 1[230.00 - 230.00 kV] | N-2 (STR): Beacon - Boulder 230 kV & Beacon - Kootenai 230 kV | -31.02 |
| 183 | hs | 350.23 | Line HUETTER (48159) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BF: A638 Rathdrum 115 kV, Appleway-Rathdrum | -4.11 |

Contingency analysis for the 350 MW request reveals 141 new facility violations between the two cases studied, with the highest instance of thermal overloading shown in Figure 3 for the loss of both the Beacon – Kootenai and Boulder – Lancaster 230 kV transmission lines.

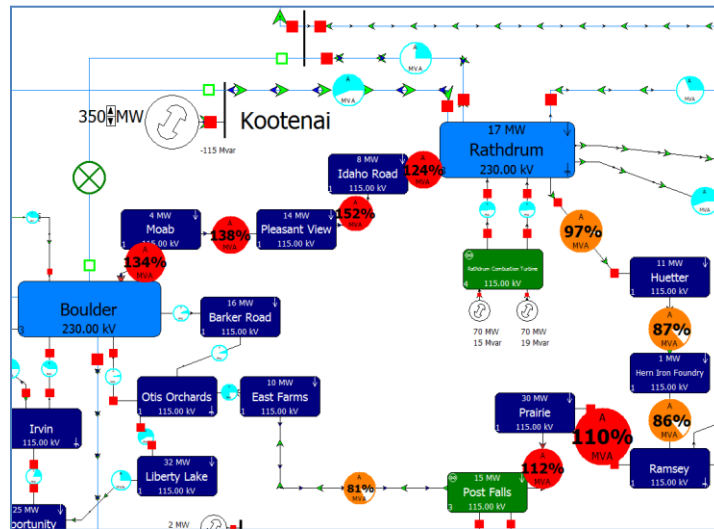


FIGURE 3: WORST PERFORMING CONTINGENCY EVENT; HEAVY SUMMER CASE; 350 MW REQUEST

Project Alternatives

Historic generation interconnection studies⁶ done for the same area of this request show that reconductoring alone is not sufficient for this level of incremental generation. In addition to the alternatives presented in the referenced study, a promising option includes:

1. Point of Interconnection (POI)
 - a. New 3 position Double Bus Double Breaker station (Kootenai); \$4 million
2. Upgrade 23.5 miles of 115 kV transmission line to a minimum summer rating of 166 MVA for \$7.0 million
3. Construct a new, 5-position 230 kV station approximately 1 mile west of Indian Trails station for \$11 million
 - a. Terminate the Bell – Westside and Coulee – Westside 230 kV transmission lines at this station
4. Construct a new 35 mile 230 kV, 800 MVA summer rated transmission line from Rathdrum station to the newly construction station for \$25.2 million

⁶ http://www.oasis.oati.com/AVAT/AVATdocs/Rathdrum500_Final.pdf



Rathdrum Station

Three incremental outputs were requested for this station: 26, 50, and 200 MW. These requests were studied as follows:

- 26 MW supplied by upgrading the existing turbines
- 50 and 200 MW coming from symmetrical generators at each of the Rathdrum 115 kV buses
- 50 and 200 MW supplied by a single generator placed at the Rathdrum 230 kV bus (see Figure 4)

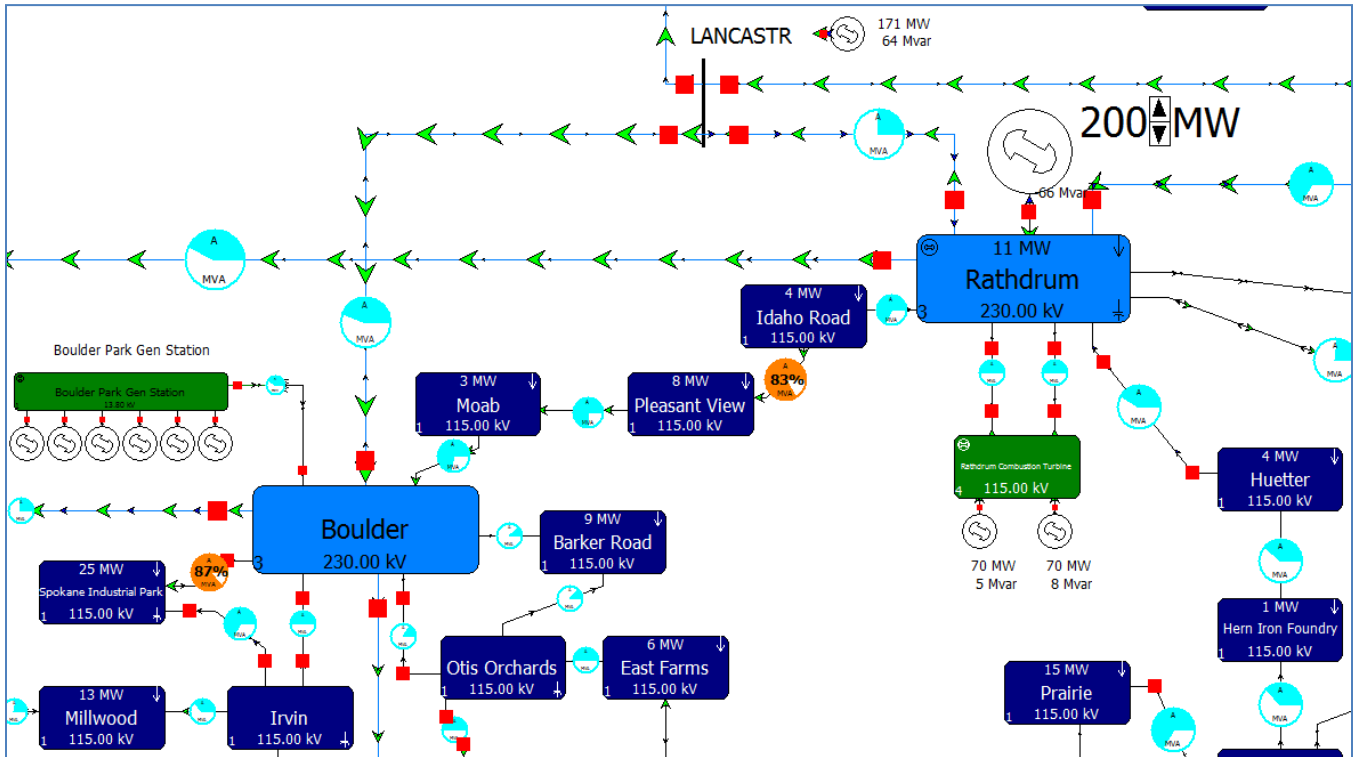


FIGURE 4: 200 MW INCREMENTAL GENERATION AT RATHDRUM; 2019 HIGH TRANSFER CASE

Rathdrum 26 MW request; 115 kV interconnection; \$2.84 million to \$10.9 million

Analysis

For P0 conditions, both study cases received generation up to 26 MW without issue.

For performance during contingencies, Table 2 shows results from the ATC analysis, and Table 3 shows Contingency Analysis results for new facility thermal violations created by requested generation at 26 MW.

TABLE 5: ATC RESULTS FOR 26 MW REQUEST

| Case | Generation | Limiting Element | Limiting CTG | % OTDF |
|------|------------|--|---|--------|
| ht | 8.16 | Line MOAB (47511) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | -12.38 |
| hs | 12.85 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1 [115.00 - 115.00 kV] | N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder #2 115 kV | 8.52 |
| ht | 13.16 | Line MOAB (47511) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | N-1: Boulder - Lancaster 230 kV | -12.79 |
| ht | 13.75 | Line EASTFARM (48117) TO OTIS (48311) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | 22.45 |
| hs | 18 | Line BOULDERE (48522) TO MOAB (47511) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -15.45 |
| ht | 18.81 | Line MOAB (47511) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | -12.37 |
| ht | 23.08 | Line BOULDERE (48522) TO IRVIN (48165) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder #1 115kV | 7.63 |
| ht | 27.97 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1 [115.00 - 115.00 kV] | N-1: Opportunity - Otis Orchards 115 kV Open @ OTI | 6.88 |

TABLE 6: CONTINGENCY ANALYSIS RESULTS FOR 26 MW REQUEST; THERMAL VIOLATIONS ONLY

| Label | Element | Percent | Case |
|--|--|---------|------|
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 103.58 | hs |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | LANCASTR (40624) -> BELLAN11 (90011) CKT 1 at BELLAN11 | 101.84 | ht |
| N-1: Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 101.83 | ht |
| N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | EASTFARM (48117) -> OTIS (48311) CKT 1 at EASTFARM | 101.82 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 101.74 | ht |
| BUS: Beacon South 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.63 | ht |
| N-2 (ADJ): Bell - Taft 500 kV and Bell - Lancaster 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.27 | ht |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 101.04 | ht |
| N-2 (ADJ): Beacon - Boulder #2 115 kV and Beacon - Ninth & Central #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at SPKINDPK | 100.86 | hs |

Project Alternatives

1. If back-tripping (\$400,000) is used to mitigate some of the existing issues, all issues created by the additional 26 MW can be mitigated by upgrading 5.8 miles of 115 kV transmission line to a minimum summer rating of 124 MVA for a cost of approximately \$2.44 million.
2. If back-tripping is not employed, all issues created by the additional 26 MW can be mitigated by upgrading:
 - a. 13.8 miles of 115 kV transmission line to a minimum summer rating of 124 MVA for \$5.8 million
 - b. 7.1 miles of the BPA's Bell – Lancaster 230 kV Transmission Line to a minimum summer rating of 675 MVA for \$5.11 million

Rathdrum 50 MW request; 115 kV interconnection; \$10.7 to \$18.7 million

Analysis

For PO conditions, both study cases received generation up to 50 MW without issue.

For performance during contingencies, Table 2 shows results from the ATC analysis, and Table 3 shows Contingency Analysis results for new facility thermal violations created by requested generation at 50 MW.

TABLE 7: ATC RESULTS FOR 50 MW REQUEST

| Case | Generation | Limiting Element | Limiting CTG | % OTDF |
|------|------------|--|---|--------|
| ht | 8.16 | Line MOAB (47511) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | -12.38 |
| hs | 12.85 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1 [115.00 - 115.00 kV] | N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder #2 115 kV | 8.52 |
| ht | 13.16 | Line MOAB (47511) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | N-1: Boulder - Lancaster 230 kV | -12.79 |
| ht | 13.75 | Line EASTFARM (48117) TO OTIS (48311) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | 22.45 |
| hs | 18 | Line BOULDERE (48522) TO MOAB (47511) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -15.45 |
| ht | 18.81 | Line MOAB (47511) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | -12.37 |
| ht | 23.08 | Line BOULDERE (48522) TO IRVIN (48165) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder #1 115kV | 7.63 |
| ht | 27.97 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1 [115.00 - 115.00 kV] | N-1: Opportunity - Otis Orchards 115 kV Open @ OTI | 6.88 |
| ht | 32.72 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1 [115.00 - 115.00 kV] | BF: A290 Hot Springs 230 kV, Hot Springs-Rattlesnake | 5.72 |
| ht | 33.1 | Line BOULDERE (48522) TO MOAB (47511) CKT 1 [115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | -12.38 |
| ht | 33.9 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1 [115.00 - 115.00 kV] | BUS: Bell S3 230 kV | 6.52 |
| ht | 36.77 | Line MOAB (47511) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | -17.63 |
| ht | 36.98 | Line BOULDERE (48522) TO MOAB (47511) CKT 1 [115.00 - 115.00 kV] | N-1: Boulder - Lancaster 230 kV | -12.79 |
| hs | 37.18 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | 26.84 |
| ht | 38.49 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1 [115.00 - 115.00 kV] | N-1: Beacon - Boulder 230 kV | 7.19 |
| ht | 43.98 | Line EASTFARM (48117) TO POST FLS (48329) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -12.47 |
| ht | 44.01 | Line BOULDERE (48522) TO MOAB (47511) CKT 1 [115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | -12.37 |
| ht | 44.6 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | BF: A388 Bell S2 & S3 230 kV | 12.22 |
| ht | 46.05 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | PSF: Ramsey 115 kV | 14.06 |
| hs | 47.62 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | -15.45 |
| ht | 47.7 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | -14.27 |
| ht | 51.76 | Line BOULDERE (48522) TO MOAB (47511) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Bell - Taft 500 kV and Bell - Lancaster 230 kV | -12.25 |

TABLE 8: CONTINGENCY RESULTS FOR THERMAL ISSUES; 50 MW REQUEST

| Label | Element | Percent | Case |
|--|--|---------|------|
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 107.8 | hs |
| N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | EASTFARM (48117) -> OTIS (48311) CKT 1 at EASTFARM | 106.31 | ht |
| N-1: Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 105.59 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 105.46 | ht |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 104.66 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 104.2 | hs |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | LANCASTR (40624) -> BELLAN11 (90011) CKT 1 at BELLAN11 | 103.53 | ht |
| BUS: Beacon South 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 103.3 | ht |
| N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 103.26 | hs |
| N-1: Boulder - Lancaster 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 102.57 | ht |
| N-2 (ADJ): Bell - Taft 500 kV and Bell - Lancaster 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.54 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 102.47 | ht |
| N-2 (ADJ): Beacon - Boulder #2 115 kV and Beacon - Ninth & Central #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at SPKINDPK | 102.09 | hs |
| N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at SPKINDPK | 101.83 | hs |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 101.63 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | POST FLS (48329) -> EASTFARM (48117) CKT 1 at POST FLS | 101.27 | ht |
| N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder #1 115kV | BOULDERE (48522) -> IRVIN (48165) CKT 1 at BOULDERE | 101.26 | ht |
| N-1: Opportunity - Otis Orchards 115 kV Open @ OTI | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.21 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | BELLAN11 (90011) -> BELL S3 (40090) CKT 1 at BELLAN11 | 101.17 | ht |
| PSF: Ramsey 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.87 | ht |
| N-1: Beacon - Boulder 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 100.51 | ht |

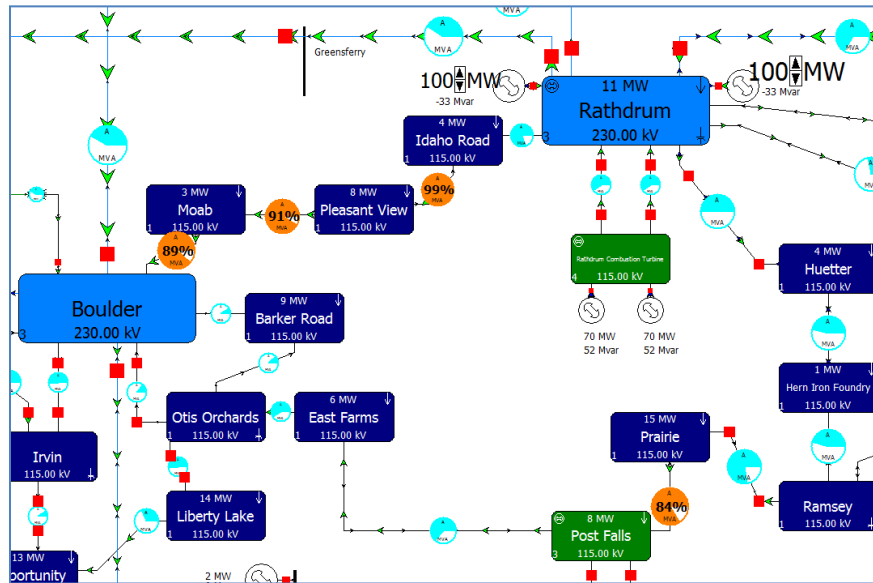
Project Alternatives

1. POI at Rathdrum Station would cost an estimated \$1 million
2. Project options necessary to mitigate new facility violations:
 - a. If back-tripping (\$400,000) is used to mitigate some of the existing issues, all issues created by the additional 50 MW can be mitigated by upgrading 22.2 miles of 115 kV transmission line to a minimum summer rating of 131 MVA for a cost of approximately \$9.3 million.
 - b. If back-tripping is not employed, all issues created by the additional 50 MW can be mitigated by upgrading:
 - i. 29.8 miles of 115 kV transmission line to a minimum summer rating of 131 MVA for \$12.5 million
 - ii. 7.2 miles of the BPA's Bell – Lancaster 230 kV Transmission Line to a summer rating of 675 MVA for \$5.18 million

Rathdrum 200 MW request; 115 kV interconnection; \$10.3 to \$48.5 million

Analysis

For P0 conditions, both study cases show significant loading on the local 115 kV system as shown in Figure 5.



For performance during contingencies, an additional 200 MW at Rathdrum station 115 kV buses creates facility thermal violations for 137 unique contingency events (See [Appendix C](#)). Table 9 presents a list of all facilities overloaded for this generation level, and it shows the sum of percent thermal overload for each facility in each case.

TABLE 9: SUM OF FACILITY THERMAL OVERLOADS; 200 MW REQUEST

| Facilities | hs | ht |
|--|---------|----------|
| IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 1211.48 | 11050.11 |
| BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 1062.15 | 2939.24 |
| PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 574.11 | 4778.41 |
| RAMSEY (48349) -> PRAIRIEB (40855) CKT 1 at RAMSEY | 421.5 | 201.68 |
| RATHDRMW (48355) -> HUETTER (48159) CKT 1 at HUETTER | 325.84 | |
| PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 324.22 | 2633.82 |
| MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 260.06 | 4351.73 |
| RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 239.45 | 422.67 |
| HUETTER (48159) -> HERN (48155) CKT 1 at HERN | 200.73 | |
| SPKINDPK (48405) -> IRVIN (48165) CKT 1 at IRVIN | 110.04 | |
| OPPORTUN (48299) -> CHESTER (48069) CKT 1 at CHESTER | 107.21 | |
| ROSSPARK (48371) -> THIRHACH (48431) CKT 1 at ROSSPARK | 100.55 | |
| POST FLS (48329) -> EASTFARM (48117) CKT 1 at POST FLS | | 231.07 |
| LANCASTR (40624) -> BELLAN11 (90011) CKT 1 at BELLAN11 | | 114.64 |
| BOULDERE (48522) -> IRVIN (48165) CKT 1 at BOULDERE | | 112.19 |
| WEST (48463) -> WESTBPA2 (41276) CKT 1 at WESTBPA2 | | 102.26 |
| BELLAN11 (90011) -> BELL S3 (40090) CKT 1 at BELLAN11 | | 112.03 |
| EASTFARM (48117) -> OTIS (48311) CKT 1 at EASTFARM | | 356.45 |



Figure 6 shows system thermal performance after the loss of both the Kootenai – Rathdrum and Lancaster – Rathdrum 230 kV transmission lines; this is the worst performing event.

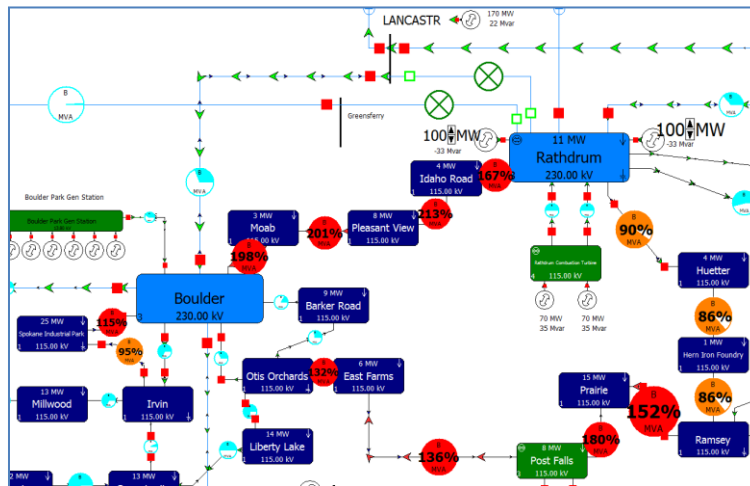


FIGURE 6: WORST PERFORMING CONTINGENCY EVENT; HIGH TRANSFER SCENARIO

Project Alternatives

1. POI at Rathdrum Station would cost an estimated \$1 million
2. Three alternatives for mitigating new facility violations:
 - a. If back-tripping is used to mitigate some of the existing issues, all issues created by the additional 50 MW can be mitigated by upgrading 22.2 miles of 115 kV transmission line to a minimum summer rating of 131 MVA for a cost of approximately \$9.3 million.
 - b. If back-tripping is not employed, all issues created by the additional 200 MW can be mitigated by upgrading:
 - i. 52.8 miles of 115 kV transmission line to a minimum summer rating of 174 MVA for \$22.2 million
 - ii. 7.2 miles of the BPA’s Bell – Lancaster 230 kV Transmission Line to a summer rating of 675 MVA for \$5.18 million
 - c. Construct a new 230 kV transmission line from Rathdrum Station to a new station north of Westside Station
 - i. Construct a new, 5-position 230 kV station approximately 1 mile west of Indian Trails station alongside the 500 kV right-of-way for \$11 million
 1. Terminate the Bell – Westside and Coulee – Westside 230 kV transmission lines at this station
 - ii. Construct a new, 35 mile 230 kV, 800 MVA summer rated transmission line from Rathdrum station to the newly construction station for \$25.2 million
 - iii. Upgrade 31.7 miles of 115 kV transmission lines to a summer rating greater than 156 MVA for \$13.3 million



Rathdrum 50 MW Request; 230 kV interconnection; \$7 to \$16.8 million

Analysis

For PO conditions, both study cases received generation up to 50 MW without issue.

For performance during contingencies, Table 2 shows results from the ATC analysis, and Table 3 shows Contingency Analysis results for new facility violations created by requested generation at 50 MW.

TABLE 10: ATC RESULTS FOR 50 MW REQUEST

| Case | Trans Lim | Limiting Element | Limiting CTG | % OTDF |
|------|-----------|--|---|--------|
| ht | 3.85 | Line MOAB (47511) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | -5.65 |
| ht | 3.86 | Line EASTFARM (48117) TO OTIS (48311) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | 20.28 |
| ht | 25.55 | Line MOAB (47511) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | -5.65 |
| ht | 26.31 | Line BOULDERE (48522) TO IRVIN (48165) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder #1 115kV | 5.3 |
| ht | 33.11 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1 [115.00 - 115.00 kV] | N-1: Opportunity - Otis Orchards 115 kV Open @ OTI | 4.15 |
| hs | 34.3 | Line BOULDERE (48522) TO MOAB (47511) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | -9.48 |
| hs | 38.3 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | 24.1 |
| ht | 39.42 | Line EASTFARM (48117) TO POST FLS (48329) CKT 1 [115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | -7.6 |
| ht | 47.21 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1 [115.00 - 115.00 kV] | N-1: Beacon - Boulder 230 kV | 5 |
| ht | 56.03 | Line MOAB (47511) TO PLEASANT (48319) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Bell - Taft 500 kV and Bell - Lancaster 230 kV | -4.55 |

TABLE 11: CONTINGENCY RESULTS FOR 50 MW REQUEST

| Label | Element | Percent | Case |
|---|--|---------|------|
| N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | EASTFARM (48117) -> OTIS (48311) CKT 1 at EASTFARM | 107.55 | ht |
| N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 105.51 | hs |
| N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 103.02 | hs |
| N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | BELLAN11 (90011) -> BELL S3 (40090) CKT 1 at BELLAN11 | 102.75 | ht |
| N-1: Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 102.67 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 102.5 | ht |
| N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 102.06 | hs |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 101.79 | ht |
| N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | POST FLS (48329) -> EASTFARM (48117) CKT 1 at POST FLS | 101.18 | ht |
| N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder #1 115kV | BOULDERE (48522) -> IRVIN (48165) CKT 1 at BOULDERE | 100.51 | ht |
| N-1: Opportunity - Otis Orchards 115 kV Open @ OTI | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 100.49 | ht |

Project Alternatives

1. POI at Rathdrum Station would cost an estimated \$1.5 million
2. Project options necessary to mitigate new facility violations:
 - a. If back-tripping is used to mitigate some of the existing issues, all issues created by the additional 50 MW can be mitigated by upgrading 13 miles of 115 kV transmission line to a minimum summer rating of 131 MVA for a cost of approximately \$5.5 million.
 - b. If back-tripping is not employed, all issues created by the additional 50 MW can be mitigated by upgrading:
 - i. 36.3 miles of 115 kV transmission line to a summer rating of 131 MVA for \$15.2 million
 - ii. 0.1 miles of the BPA’s Bell – Bell AN11 230 kV Transmission Line to a summer rating of 800 MVA for \$100,000



Rathdrum 200 MW Request; 230 kV interconnection; \$15.5 to \$21.5 million

Analysis

For PO conditions, both study cases received generation up to 200 MW without issue.

For performance during contingencies, Table 2 shows results from the ATC analysis, and Table 3 shows Contingency Analysis results for new facility violations created by requested generation at 200 MW.

TABLE 12: ATC RESULTS FOR 200 MW REQUEST

| Case | Trans Lim | Limiting Element | Limiting CTG | % OTDF |
|------|-----------|--|--|--------|
| ht | 2.69 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BUS: Ramsey 115 kV | 4.57 |
| ht | 3.14 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | BUS: Otis Orchards 115 kV | 3.69 |
| ht | 4.04 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Post Falls - Ramsey 115 kV & Ramsey - Rathdrum # 115 kV | 4.51 |
| ht | 7.09 | Line BENEWAH (48037) TO PINE CRK (48317) CKT 1[230.00 - 230.00 kV] | BF: A288 Hot Springs 230 kV, Hot Springs-Noxon Rapids # 1 | -4.16 |
| ht | 10.83 | Line BENEWAH (48037) TO PINE CRK (48317) CKT 1[230.00 - 230.00 kV] | BUS: Hot Springs 230 kV | -4.16 |
| ht | 23.7 | Line MOAB (47511) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: A1661 Boulder-Lancaster, Lancaster Generator # 1 & # 2 | -6.86 |
| ht | 26.27 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | N-1: Lancaster - Rathdrum 230 kV | -11.43 |
| hs | 34.3 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | -9.48 |
| ht | 36.76 | Line MOAB (47511) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: R508 Lancaster-Rathdrum, Rathdrum # 1230/115 Transformer | -10.04 |
| hs | 38.3 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | 24.1 |
| ht | 41.36 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | N-1: Boulder - Lancaster 230 kV | -5.85 |
| ht | 45.32 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | PSF: Otis Orchards 115 kV | 3.69 |
| ht | 47.76 | Line MOAB (47511) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: A1658 Bell-Lancaster, Lancaster-Rathdrum | -11.48 |
| ht | 49.09 | Line EASTFARM (48117) TO OTIS (48311) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | 6.29 |
| ht | 50.42 | Line PRAIRIEB (40855) TO RAMSEY (48349) CKT 1[115.00 - 115.00 kV] | BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | -9.7 |
| ht | 57.6 | Line MOAB (47511) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: A388 Bell S2 & S3 230 kV | -4.5 |
| ht | 59.23 | Line MOAB (47511) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: R408 Lancaster-Rathdrum, Rathdrum # 2 230/115 Transformer | -9.33 |
| ht | 63.75 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder # 2 230/115 Transformer | -5.65 |
| ht | 64.36 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder # 1230/115 Transformer | -5.65 |
| ht | 66.1 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | BF: R508 Lancaster-Rathdrum, Rathdrum # 1230/115 Transformer | -10.04 |
| ht | 73.78 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Rathdrum 230 kV and Lancaster - Noxon 230 kV | 4.87 |
| ht | 73.88 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | BF: A1658 Bell-Lancaster, Lancaster-Rathdrum | -11.48 |
| ht | 73.99 | Line IRVIN (48165) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | -8.05 |
| hs | 77.96 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | -9.48 |
| ht | 79.55 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | BF: A1661 Boulder-Lancaster, Lancaster Generator # 1 & # 2 | -5.85 |
| hs | 88.83 | Line MOAB (47511) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | -24.1 |
| ht | 91.38 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | BF: R408 Lancaster-Rathdrum, Rathdrum # 2 230/115 Transformer | -9.33 |
| ht | 96.43 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | N-1: Lancaster - Rathdrum 230 kV | -9.46 |
| hs | 102.87 | Line BOULDERE (48522) TO MOAB (47511) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | -24.1 |
| ht | 114.54 | Line BELLAN11 (90011) TO LANCASTER (40624) CKT 1[230.00 - 230.00 kV] | BF: R427 Beacon North & South 230 kV | -32.19 |
| ht | 115.07 | Line BELLAN11 (90011) TO LANCASTER (40624) CKT 1[230.00 - 230.00 kV] | N-2 (STR): Beacon - Boulder 230 kV & Beacon - Rathdrum 230 kV | -31.02 |
| hs | 119.79 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | -24.1 |
| ht | 119.94 | Line HUETTER (48169) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | -13.17 |
| ht | 137.25 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | BF: A1658 Bell-Lancaster, Lancaster-Rathdrum | -9.49 |
| ht | 137.57 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | N-1: Lancaster - Rathdrum 230 kV | -11.43 |
| hs | 140.52 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder # 2 115 kV | 6.08 |
| ht | 145.93 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | BF: R508 Lancaster-Rathdrum, Rathdrum # 1230/115 Transformer | -8.32 |
| hs | 146.04 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Boulder # 2 115 kV and Beacon - Ninth & Central # 2 115 kV | 3.84 |
| ht | 154.16 | Line HERN (48155) TO HUETTER (48169) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | -13.17 |
| ht | 154.96 | Line BELL S3 (40090) TO BELLAN11 (90011) CKT 1[230.00 - 230.00 kV] | BF: R427 Beacon North & South 230 kV | -32.19 |
| ht | 157.02 | Line BELL S3 (40090) TO BELLAN11 (90011) CKT 1[230.00 - 230.00 kV] | N-2 (STR): Beacon - Boulder 230 kV & Beacon - Rathdrum 230 kV | -31.02 |
| ht | 160.88 | Line HERN (48155) TO RAMSEY (48349) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | 13.17 |
| ht | 166 | Line IDAHO_RD (48161) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BF: A1186 Lancaster-Noxon, Boulder-Lancaster | -6.08 |
| hs | 180.74 | Line PRAIRIEB (40855) TO RAMSEY (48349) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | -20.29 |
| ht | 185.55 | Line IRVIN (48165) TO MILLWOOD (48237) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Boulder 230 kV & Beacon - Rathdrum 230 kV | 7.57 |
| hs | 198.16 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: R554 Boulder-Lancaster, Boulder # 2 230/115 Transformer | 5.92 |
| hs | 198.55 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: R454 Boulder-Lancaster, Boulder # 2 230/115 Transformer | 5.91 |
| ht | 201.01 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | BF: A1186 Lancaster-Noxon, Boulder-Lancaster | -4.95 |
| hs | 215.17 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2: Beacon - Boulder 230 kV & Boulder - Irvin # 2 115 kV | 7.15 |
| hs | 216.58 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | N-1: Boulder - Lancaster 230 kV | 6.12 |
| hs | 231.38 | Line IRVIN (48165) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | BF: R427 Beacon North & South 230 kV | -7.57 |
| hs | 238.18 | Line PRAIRIEB (40855) TO RAMSEY (48349) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | -7.97 |
| hs | 243.76 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | -7.97 |
| hs | 293.13 | Line HUETTER (48169) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BUS: Rathdrum East 115 kV | -4.51 |
| hs | 299.93 | Line HUETTER (48169) TO RATHDRMW (48355) CKT 1[115.00 - 115.00 kV] | BF: A506 Rathdrum 115 kV, Pine Street-Rathdrum | -4.51 |
| hs | 301.74 | Line PRAIRIEB (40855) TO RAMSEY (48349) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | -6.59 |
| ht | 311.86 | Line POST FLS (48329) TO PRAIRIEB (40855) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | -6.59 |
| ht | 326.58 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BUS: Bell S3 230 kV | 5.36 |
| ht | 326.58 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: A572 Bell S3 230 kV, Bell-Boundary # 3 | 5.36 |
| ht | 337.01 | Line IDAHO_RD (48161) TO PLEASANT (48319) CKT 1[115.00 - 115.00 kV] | BF: A148 Garrison-Taft # 2, Hot Springs-Taft | 3.92 |
| hs | 368.83 | Line CHESTER (48069) TO OPPORTUN (48299) CKT 1[115.00 - 115.00 kV] | BF: A600 Beacon North & South 115 kV | -4.37 |

TABLE 13: NEW FACILITY THERMAL VIOLATIONS FOR 200 MW REQUEST

| Label | Element | Percent | Case |
|--|---|---------|------|
| N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 142.76 | hs |
| N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | EASTFARM (48117) -> OTIS (48311) CKT 1at EASTFARM | 131.27 | ht |
| N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1at PLEASANT | 130.97 | hs |
| N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1at MOAB | 127.64 | hs |
| N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1at PLEASANT | 122.3 | hs |
| N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1at MOAB | 118.82 | hs |
| N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1at RATHDRMW | 116.18 | hs |
| N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | BELLAN11(90011) -> BELL S3 (40090) CKT 1at BELLAN11 | 115 | ht |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 113.44 | ht |
| N-1: Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1at PLEASANT | 112.61 | ht |
| BF: R554 Boulder-Lancaster, Boulder # 1230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1at PLEASANT | 112.19 | ht |
| BF: R454 Boulder-Lancaster, Boulder # 2 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1at PLEASANT | 111.32 | ht |
| N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | POST FLS (48329) -> EASTFARM (48117) CKT 1at POST FLS | 110.94 | ht |
| N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1at RATHDRMW | 110.38 | hs |
| N-1: Boulder - Lancaster 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1at MOAB | 109.6 | ht |
| BF: R554 Boulder-Lancaster, Boulder # 1230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1at MOAB | 109.21 | ht |
| BF: R454 Boulder-Lancaster, Boulder # 2 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1at MOAB | 108.3 | ht |
| N-1: Lancaster - Rathdrum 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 107.27 | ht |
| N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder # 1115kV | BOULDERE (48522) -> IRVIN (48165) CKT 1at BOULDERE | 107.21 | ht |
| N-2 (ADJ): Beacon - Rathdrum 230kV and Bell - Lancaster 230kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 106.79 | ht |
| N-2 (STR): Beacon - Rathdrum 230 kV & Boulder - Lancaster 230 kV | EASTFARM (48117) -> OTIS (48311) CKT 1at EASTFARM | 106.51 | ht |
| N-1: Beacon - Boulder 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 106.09 | ht |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | PLEASANT (48319) -> MOAB (47511) CKT 1at PLEASANT | 105.96 | ht |
| BF: A1561 Boulder-Lancaster, Lancaster Generator # 1 & # 2 | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 105.65 | ht |
| N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1at PRAIRIEB | 105.63 | hs |
| N-1: Opportunity - Otis Orchards 115 kV Open @ OTI | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 105.41 | ht |
| BF: A1186 Lancaster-Noxon, Boulder-Lancaster | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 105.28 | ht |
| N-2 (ADJ): Beacon - Rathdrum 230kV and Bell - Lancaster 230kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 105.18 | ht |
| BUS: Beacon North 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 104.83 | ht |
| N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder # 2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 103.8 | hs |
| PSF: Ramsey 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 103.54 | ht |
| BF: R508 Lancaster-Rathdrum, Rathdrum # 1230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 103.27 | ht |
| N-2 (STR): Beacon - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | RAMSEY (48349) -> PRAIRIEB (40855) CKT 1at RAMSEY | 103.24 | hs |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | MOAB (47511) -> BOULDERE (48522) CKT 1at MOAB | 103.02 | ht |
| N-1: Opportunity - Otis Orchards 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 102.9 | ht |
| N-2 (ADJ): Beacon - Boulder # 2 115 kV and Beacon - Ninth & Central # 2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 102.01 | hs |
| N-2: Beacon - Boulder 230 kV & Beacon - Irvin # 1115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 101.87 | ht |
| BF: A645 Otis Orchards 115 kV, Boulder-Otis Orchards | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 101.36 | ht |
| BUS: Beacon North 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 101.31 | ht |
| BF: R427 Beacon North & South 230 kV | SPKINDPK (48405) -> IRVIN (48165) CKT 1at IRVIN | 101.28 | hs |
| BF: R408 Lancaster-Rathdrum, Rathdrum # 2 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 101.16 | ht |
| BF: R554 Boulder-Lancaster, Boulder # 1230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 101.15 | hs |
| N-1: Beacon - Rathdrum 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 101.15 | ht |
| BF: R454 Boulder-Lancaster, Boulder # 2 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 101.12 | hs |
| BF: A1717 Boulder East & West 115 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1at PRAIRIEB | 100.94 | ht |
| BF: A1558 Bell-Lancaster, Lancaster-Rathdrum | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 100.8 | ht |
| N-2: Beacon - Boulder 230 kV & Boulder - Irvin # 2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 100.68 | hs |
| N-1: Opportunity - Otis Orchards 115 kV Open @ OPT | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 100.67 | ht |
| N-1: Boulder - Lancaster 230 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1at PRAIRIEB | 100.59 | ht |
| BF: A667 Ramsey 115 kV, Appleway-Ramsey | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 100.53 | ht |
| BF: A668 Ramsey 115 kV, Ramsey-Rathdrum # 1 | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 100.48 | ht |
| N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | POST FLS (48329) -> EASTFARM (48117) CKT 1at POST FLS | 100.35 | ht |
| N-2 (ADJ): Beacon - Bell # 4 230kV and Beacon - Rathdrum 230kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 100.3 | ht |
| N-1: Beacon - Rathdrum 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 100.28 | ht |
| N-2 (ADJ): Beacon - Bell # 4 230kV and Beacon - Rathdrum 230kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1at IDAHO_RD | 100.27 | ht |
| BF: A642 Otis Orchards 115 kV, Otis Orchards-Post Falls | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 100.04 | ht |

Project Alternatives

1. POI at Rathdrum Station would cost an estimated \$1.5 million
2. Project options necessary to mitigate new facility violations:
 - a. If back-tripping is used to mitigate some of the existing issues, all issues created by the additional 200 MW can be mitigated by upgrading 33.4 miles of 115 kV transmission line to a minimum summer rating of 175 MVA for a cost of approximately \$14.0 million.
 - b. If back-tripping is not employed, all issues created by the additional 200 MW can be mitigated by upgrading:
 - i. 47.3 miles of 115 kV transmission line to a minimum summer rating of 175 MVA for \$19.9 million
 - ii. 0.1 miles of the BPA's Bell – Bell AN11 230 kV Transmission Line to a summer rating of 800 MVA for \$100,000



Thornton Station

Thornton 30 MW and 100 MW Request; \$400,000

Two incremental wind energy outputs were requested for this station: 30 MW and 100 MW. These requests were studied as coming from a single wind plant as depicted in Figure 7:

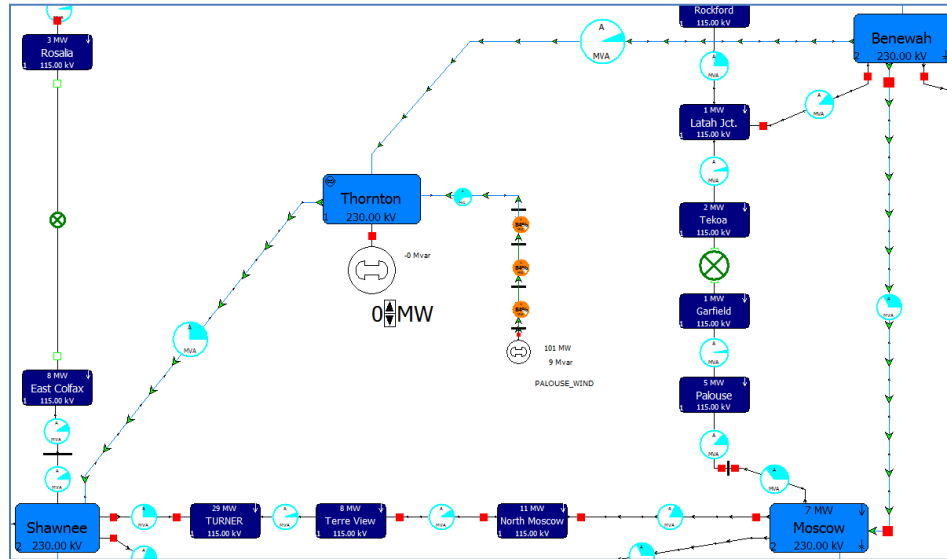


FIGURE 7: THORNTON WIND REQUEST; 2024 HEAVY SUMMER CASE

Analysis

For P0 conditions, both study cases received generation up to 100 MW without issue.

For performance during contingencies, Table 2 shows results from the ATC analysis, and Table 3 shows Contingency Analysis results for existing facility violations exacerbated by requested generation at 100 MW.

TABLE 14: ATC RESULTS FOR THORNTON WIND REQUEST

| Case | Trans Lim | Limiting Element | Limiting CTG | % OTDF |
|------|-----------|---|---|--------|
| 19ht | 25.07 | Line BOULDERE (48522) TO IRVIN (48165) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder # 1115kV | 5.32 |
| 24hs | 36.5 | Line IRVIN (48165) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | BF: R427 Beacon North & South 230 kV | -5.23 |
| 19ht | 45.81 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-1: Beacon - Boulder 230 kV | 5.03 |
| 24hs | 110.87 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-1: Boulder - Irvin# 2 115 kV | 3.81 |
| 24hs | 138.73 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2 (STR): Beacon - Boulder 230 kV & Beacon - Rathdrum 230 kV | 5.95 |
| 19ht | 141.46 | Line BOULDERW (48520) TO SPKINDPK (48405) CKT 1[115.00 - 115.00 kV] | N-2: Beacon - Boulder 230 kV & Beacon - Irvin# 1115 kV | 4.62 |

TABLE 15: THERMAL FACILITY VIOLATIONS EXACERBATED BY NEW GENERATION

| Label | Element | Percent | Case |
|---|---|---------|------|
| N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 106.63 | 24hs |
| BF: R427 Beacon North & South 230 kV | SPKINDPK (48405) -> IRVIN (48165) CKT 1at IRVIN | 104.47 | 24hs |
| N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder # 1115kV | BOULDERE (48522) -> IRVIN (48165) CKT 1at BOULDERE | 103.7 | 19ht |
| N-1: Beacon - Boulder 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 102.83 | 19ht |
| BF: A600 Beacon North & South 115 kV | OPPORTUN (48299) -> CHESTER (48069) CKT 1at CHESTER | 102.27 | 24hs |
| N-1: Opportunity - Otis Orchards 115 kV Open @ OTI | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 102.1 | 19ht |
| BF: A645 Otis Orchards 115 kV, Boulder-Otis Orchards | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 101.83 | 24hs |
| BUS: Beacon North 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1at BOULDERW | 100.07 | 19ht |

Project Alternatives

POI at Thornton Station would cost an estimated \$400,000

Othello Station

Othello 25 MW Solar request; \$2 million

This request involves interconnecting up to 25 MW of solar generation, which is modeled in this study as a simple generic source at the Othello Switching Station as show in Figure 8.

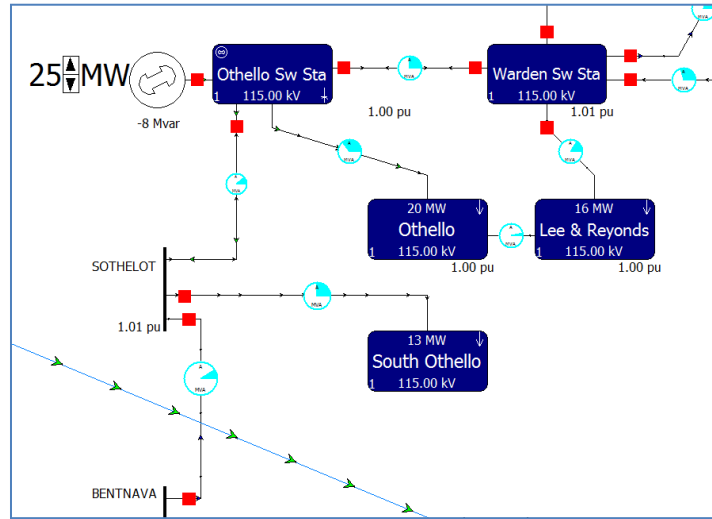


FIGURE 8: OTHELLO GENERATION REQUEST; 2024 HEAVY SUMMER CASE

Analysis

For P0 conditions, both study cases received generation up to 25 MW without issue.

For performance during contingencies, Table 16 shows results from the ATC analysis, and there are no new facility violations created by requested generation at 25 MW.

TABLE 16: ATC RESULTS FOR OTHELLO GENERATION REQUEST

| Case | Trans Lim | Limiting Element | Limiting CTG | % OTDF |
|------|-----------|--|---|--------|
| ht | 95.58 | Line OTHELOSS (48309) TO WARDEN A (48455) CKT 1 [115.00 - 115.00 kV] | N-1 Othello SS - Warden#2 115 kV Open @ OSS | 60.49 |
| ht | 105.61 | Line OTHELOSS (48309) TO WARDEN A (48455) CKT 1 [115.00 - 115.00 kV] | N-1 Othello SS - Warden#2 115 kV (OSS-L&R) | 60.49 |
| ht | 107.02 | Line OTHELLO (48307) TO OTHELOSS (48309) CKT 1 [115.00 - 115.00 kV] | N-1 Othello SS - Warden #1 115 kV | -54.95 |
| ht | 110.59 | Line OTHELOSS (48309) TO WARDEN A (48455) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Benton - Midway #2 230 kV and Benton - Othello SS 115 kV | 62.79 |
| ht | 110.64 | Line OTHELOSS (48309) TO WARDEN A (48455) CKT 1 [115.00 - 115.00 kV] | N-1 Benton - Othello SS 115 kV (OSS-SOT) | 62.79 |
| ht | 110.68 | Line OTHELOSS (48309) TO WARDEN A (48455) CKT 1 [115.00 - 115.00 kV] | N-1 Benton - Othello SS 115 kV Open @ OSS | 62.79 |
| hs | 115.23 | Line OTHELLO (48307) TO OTHELOSS (48309) CKT 1 [115.00 - 115.00 kV] | N-1 Benton - Othello SS 115 kV Open @ OSS | -37.21 |
| hs | 115.29 | Line OTHELLO (48307) TO OTHELOSS (48309) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Benton - Midway #2 230 kV and Benton - Othello SS 115 kV | -37.21 |
| hs | 115.35 | Line OTHELLO (48307) TO OTHELOSS (48309) CKT 1 [115.00 - 115.00 kV] | N-1 Benton - Othello SS 115 kV (OSS-SOT) | -37.21 |
| hs | 115.43 | Line OTHELLO (48307) TO OTHELOSS (48309) CKT 1 [115.00 - 115.00 kV] | N-2 (ROW): Benton - Midway #2 230 kV and Benton - Midway #1 115 kV and Benton - Othello SS 115 kV | -37.21 |
| hs | 115.52 | Line OTHELLO (48307) TO OTHELOSS (48309) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Benton - Midway #1 115 kV and Benton - Othello SS 115 kV | -37.21 |
| hs | 116.88 | Line OTHELOSS (48309) TO WARDEN A (48455) CKT 1 [115.00 - 115.00 kV] | N-1 Othello SS - Warden #2 115 kV Open @ OSS | 60.65 |
| hs | 119.53 | Line OTHELOSS (48309) TO WARDEN A (48455) CKT 1 [115.00 - 115.00 kV] | N-1 Benton - Othello SS 115 kV Open @ OSS | 62.79 |
| hs | 119.59 | Line OTHELOSS (48309) TO WARDEN A (48455) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Benton - Midway #2 230 kV and Benton - Othello SS 115 kV | 62.79 |
| hs | 119.65 | Line OTHELOSS (48309) TO WARDEN A (48455) CKT 1 [115.00 - 115.00 kV] | N-1 Benton - Othello SS 115 kV (OSS-SOT) | 62.79 |
| hs | 119.74 | Line OTHELOSS (48309) TO WARDEN A (48455) CKT 1 [115.00 - 115.00 kV] | N-2 (ROW): Benton - Midway #2 230 kV and Benton - Midway #1 115 kV and Benton - Othello SS 115 kV | 62.79 |
| ht | 125.82 | Line OTHELLO (48307) TO OTHELOSS (48309) CKT 1 [115.00 - 115.00 kV] | N-1 Benton - Othello SS 115 kV Open @ OSS | -37.21 |

Project Alternatives

POI at Othello Station would cost an estimated \$2 million

Northeast Station

Northeast 10 MW; \$0

This request involves interconnecting up to 10 MW of additional generation, which is modeled in this study as a simple generic source at the Northeast Station as show in **Error! Reference source not found.**

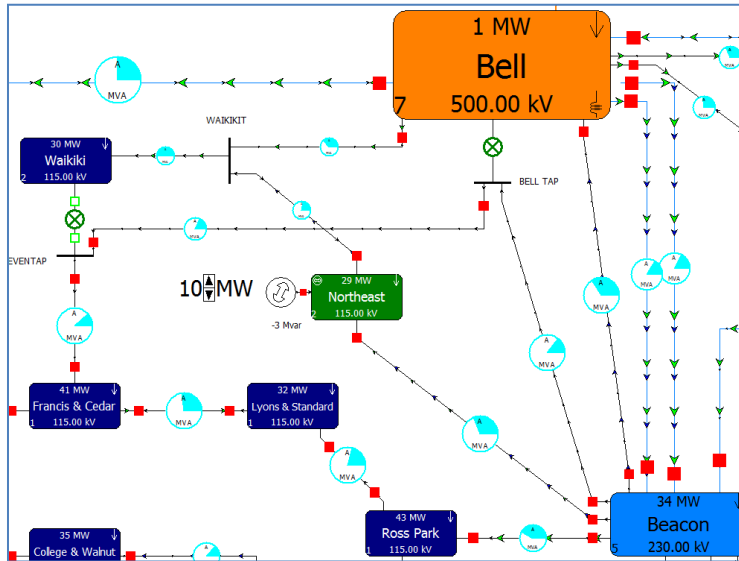


FIGURE 9: NORTHEAST GENERATION REQUEST; 2024 HEAVY SUMMER CASE

Analysis

For P0 conditions, both study cases received generation up to 10 MW without issue.

For performance during contingencies, Table 17 shows results from the ATC analysis, and there are no new facility violations created by requested generation at 10 MW.

TABLE 17: ATC RESULTS FOR NORTHEAST GENERATION REQUEST

| Case | Trans Lim | Limiting Element | Limiting CTG | %OTDF |
|------|-----------|--|---|-------|
| Nt | 76.49 | Line BEACON N (48023) TO NORTHEAS (48277) CKT 1 [115.00 - 115.00 kV] | N-2 (ROW and ADJ): Beacon - Francis & Cedar 115 kV and Bell - Northeast 115 kV | -10.0 |
| Nt | 76.52 | Line BEACON N (48023) TO NORTHEAS (48277) CKT 1 [115.00 - 115.00 kV] | N-1 Bell - Northeast 115 kV | -10.0 |
| Nt | 76.55 | Line BEACON N (48023) TO NORTHEAS (48277) CKT 1 [115.00 - 115.00 kV] | N-1 Bell - Northeast 115 kV Open @ NE | -10.0 |
| Nt | 77.16 | Line BEACON N (48023) TO NORTHEAS (48277) CKT 1 [115.00 - 115.00 kV] | BF: B356 Bell 115 kV, Bell-Northeast | -10.0 |
| Nt | 89.73 | Line BEACON N (48023) TO NORTHEAS (48277) CKT 1 [115.00 - 115.00 kV] | BF: B346 Bell 115 kV, Addy-Bell | -10.0 |
| Nt | 93.44 | Line BELL BPA (40087) TO WAIKIKIT (48449) CKT 1 [115.00 - 115.00 kV] | N-2 (ROW): Beacon - Bell #5 230 kV and Beacon - Francis & Cedar 115 kV and Beacon - Northeast 115 kV | -10.0 |
| Nt | 94.58 | Line BELL BPA (40087) TO WAIKIKIT (48449) CKT 1 [115.00 - 115.00 kV] | BF: A000 Beacon North & South 115 kV | -10.0 |
| Nt | 94.64 | Line BELL BPA (40087) TO WAIKIKIT (48449) CKT 1 [115.00 - 115.00 kV] | 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 | -10.0 |
| Nt | 95.3 | Line NORTHEAS (48277) TO WAIKIKIT (48449) CKT 1 [115.00 - 115.00 kV] | BF: A572 Bell S3 230 kV, Bell-Boundary #3 | 62.72 |
| Nt | 95.42 | Line NORTHEAS (48277) TO WAIKIKIT (48449) CKT 1 [115.00 - 115.00 kV] | BUS: Bell S3 230 kV | 62.72 |
| Nt | 97.6 | Line NORTHEAS (48277) TO WAIKIKIT (48449) CKT 1 [115.00 - 115.00 kV] | N-2 (ROW): Bell - Taft 500 kV and Bell - Lancaster 230 kV and Beacon - Rathdrum 230 kV and Boulder - Lancaster 230 kV | 62.09 |
| Nt | 98.22 | Line NORTHEAS (48277) TO WAIKIKIT (48449) CKT 1 [115.00 - 115.00 kV] | N-2 (ADJ): Bell - Taft 500 kV and Bell - Lancaster 230 kV | 62.11 |
| Nt | 101.71 | Line BOULDER (48524) TO BENEWAH (48037) CKT 1 [230.00 - 230.00 kV] | N-2 (ROW): Bell - Coulee #6 500 kV and Bell - Coulee #3 230 kV and Bell - Coulee #5 230 kV and Coulee - Westside 230 kV and Bell - Creston 115 kV | 12.81 |

Project Alternatives

None required



Kettle Falls Station

Kettle Falls 10 MW; \$0

This request involves interconnecting up to 10 MW of additional generation, which is modeled in this study as a simple generic source at the Kettle Falls Station as shown in Figure 10.

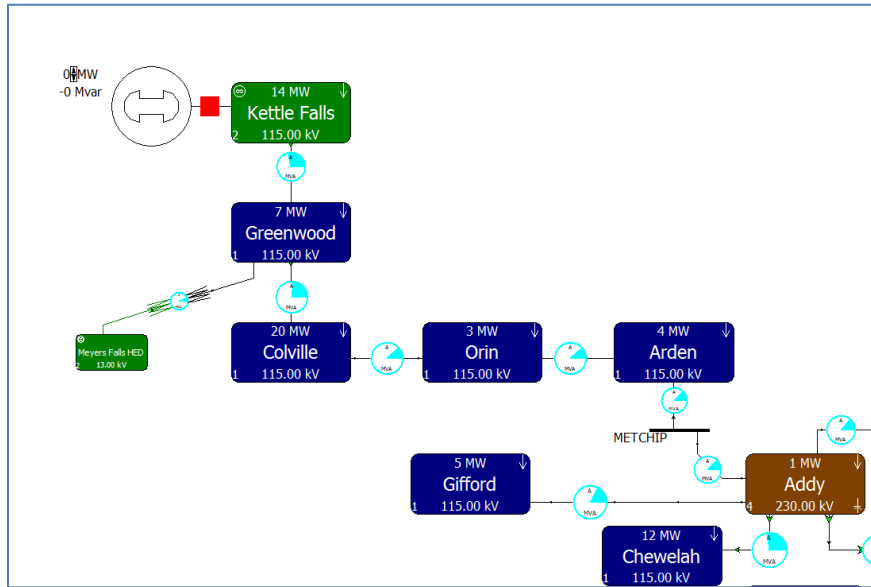


FIGURE 10: KETTLE FALLS GENERATION REQUEST; 2024 HEAVY SUMMER CASE

Analysis

For P0 conditions, both study cases received generation up to 10 MW without issue.

For performance during contingencies, Table 18 shows results from the ATC analysis, and there are no new facility violations created by requested generation at 10 MW.

TABLE 18: ATC RESULTS FOR KETTLE FALLS GENERATION REQUEST

| Case | Trans Lim | Limiting Element | Limiting CTG | %OTDF |
|------|-----------|--|---|--------|
| ht | 76.04 | Line GREENWDA (48143) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | N-t Addy - Colville BPA 115 kV | -63.23 |
| ht | 76.3 | Line GREENWDA (48143) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | N-t Kettle Falls Tap 115 kV | -100 |
| ht | 76.32 | Line GREENWDA (48143) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | N-t Kettle Falls Tap 115 kV Open @ KET | -100 |
| ht | 76.74 | Line KETTLE T (40607) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | BF: B1145 Addy 115 kV, Addy-Kettle Falls | -100 |
| ht | 76.75 | Line KETTLE T (40607) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | N-t Addy - Kettle Falls 115 kV Open @ KET | -100 |
| ht | 77.26 | Line GREENWDA (48143) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | BF: B1768 Colville BPA 115 kV, Colville BPA-Kettle Falls | -100 |
| ht | 77.98 | Line KETTLE T (40607) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | N-t Addy - Kettle Falls 115 kV | -100 |
| ht | 79.91 | Line COLV AVA (48083) TO GREENWDA (48143) CKT 1 [115.00 - 115.00 kV] | N-t Kettle Falls Tap 115 kV Open @ KET | -100 |
| ht | 79.92 | Line COLV AVA (48083) TO GREENWDA (48143) CKT 1 [115.00 - 115.00 kV] | N-t Kettle Falls Tap 115 kV | -100 |
| ht | 80.93 | Line COLV AVA (48083) TO GREENWDA (48143) CKT 1 [115.00 - 115.00 kV] | BF: B1768 Colville BPA 115 kV, Colville BPA-Kettle Falls | -100 |
| ht | 81.78 | Line COLV AVA (48083) TO GREENWDA (48143) CKT 1 [115.00 - 115.00 kV] | N-t Addy - Colville BPA 115 kV | -63.23 |
| ht | 83.12 | Line GREENWDA (48143) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | BF: B1766 Colville BPA 115 kV, Boundary-Box Canyon-Colville BPA | -100 |
| ht | 86.75 | Line COLV AVA (48083) TO GREENWDA (48143) CKT 1 [115.00 - 115.00 kV] | BUS: Colville 115 kV | -100 |
| hs | 89.01 | Line GREENWDA (48143) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | N-t Kettle Falls Tap 115 kV | -100 |
| hs | 89.01 | Line GREENWDA (48143) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | N-t Kettle Falls Tap 115 kV Open @ KET | -100 |
| hs | 89.15 | Line KETTLE T (40607) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | BF: B1145 Addy 115 kV, Addy-Kettle Falls | -100 |
| hs | 89.15 | Line KETTLE T (40607) TO KETTLEAV (48175) CKT 1 [115.00 - 115.00 kV] | N-t Addy - Kettle Falls 115 kV Open @ KET | -100 |

Project Alternatives

No mitigating steps are necessary for this request



Long Lake Dam

Long Lake 68 MW; \$19.7 million

This request involves adding 68 MW at Long Lake station, which is modeled in this study as two generators, one at each 115 kV bus as shown in Figure 11.

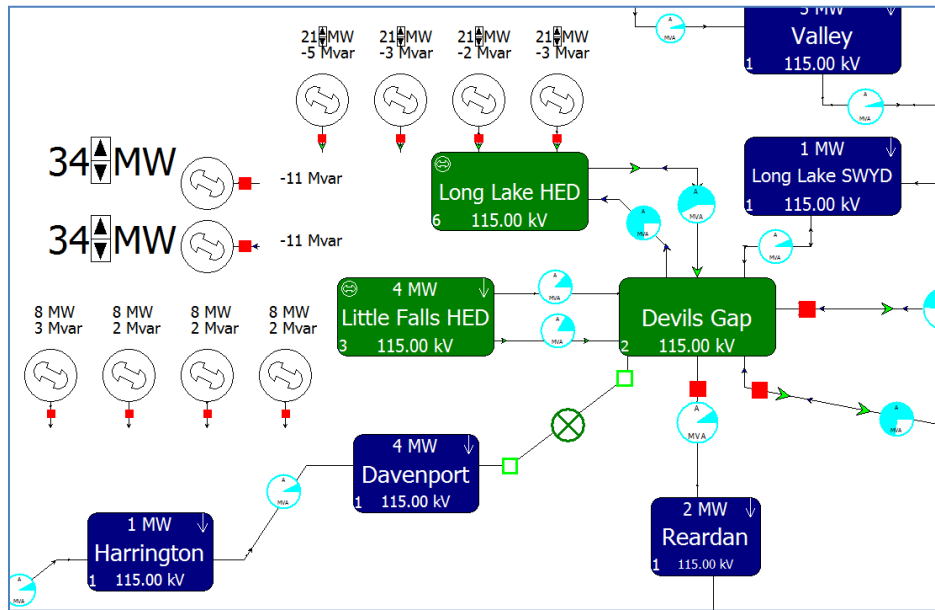


FIGURE 11: LONG LAKE GENERATION REQUEST; 2024 HEAVY SUMMER CASE

Analysis

For P0 conditions, both study cases received generation up to 68 MW without issue.

For performance during contingencies, Table 19 shows results from the ATC analysis, and Table 20 shows Contingency Analysis results for new facility violations created by requested generation.

TABLE 19: ATC RESULTS FOR LONG LAKE GENERATION REQUEST

| Case | Trans Lim | Limiting Element | Limiting CTG | % OTDF |
|------|-----------|---|---|--------|
| ht | 9.73 | Line NINEMILE (48269) TO INDTRAIL (48164) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV Open @ DGP | 65.77 |
| ht | 11.39 | Line NINEMILE (48269) TO INDTRAIL (48164) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV | 65.77 |
| ht | 12.27 | Line NINEMILE (48269) TO INDTRAIL (48164) CKT 1[115.00 - 115.00 kV] | BF: A180 Airway Heights 115 kV, Airway Heights-Devils Gap | 65.77 |
| ht | 12.29 | Line NINEMILE (48269) TO INDTRAIL (48164) CKT 1[115.00 - 115.00 kV] | PSF: Airway Heights 115 kV | 65.77 |
| ht | 16.64 | Line INDTRAIL (48164) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV Open @ DGP | 65.77 |
| ht | 18.37 | Line INDTRAIL (48164) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV | 65.77 |
| ht | 19.17 | Line INDTRAIL (48164) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | BF: A180 Airway Heights 115 kV, Airway Heights-Devils Gap | 65.77 |
| ht | 19.19 | Line INDTRAIL (48164) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | PSF: Airway Heights 115 kV | 65.77 |
| ht | 20.62 | Line NINEMILE (48269) TO INDTRAIL (48164) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV Open @ AIR | 65.77 |
| ht | 26.21 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV Open @ NMS | 62.44 |
| ht | 26.4 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV | 62.44 |
| ht | 27.63 | Line INDTRAIL (48164) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV Open @ AIR | 65.77 |
| ht | 29.37 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | PSF: Westside 115 kV | 60.74 |
| ht | 31.29 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV Open @ WES | 62.44 |
| ht | 31.45 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Coulee - Westside 230kV and Nine Mile - Westside 115kV | 62.35 |
| ht | 33.76 | Line AIRWAYHT (48009) TO GARDENSP (48131) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV Open @ NMS | 62.44 |
| ht | 33.94 | Line AIRWAYHT (48009) TO GARDENSP (48131) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV | 62.44 |
| hs | 34.7 | Line DEVILGPE (48103) TO LONGLAKE (48201) CKT 1[115.00 - 115.00 kV] | N-1 Devils Gap - Long Lake # 2 115 kV | -100 |
| hs | 34.88 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | PSF: Westside 115 kV | 60.14 |
| hs | 35.15 | Line DEVILGPE (48103) TO LONGLAKW (48199) CKT 1[115.00 - 115.00 kV] | N-1 Devils Gap - Long Lake # 1 115 kV | -100 |
| ht | 35.38 | Line DEVILGPE (48103) TO LONGLAKE (48201) CKT 1[115.00 - 115.00 kV] | N-1 Devils Gap - Long Lake # 2 115 kV | -100 |
| ht | 35.54 | Line DEVILGPE (48103) TO LONGLAKW (48199) CKT 1[115.00 - 115.00 kV] | N-1 Devils Gap - Long Lake # 1 115 kV | -100 |
| hs | 37.06 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | BF: A413 Westside 115 kV, Ninemile-Westside | 60.75 |
| ht | 37.11 | Line AIRWAYHT (48009) TO GARDENSP (48131) CKT 1[115.00 - 115.00 kV] | PSF: Westside 115 kV | 60.74 |
| ht | 38.74 | Line AIRWAYHT (48009) TO GARDENSP (48131) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV Open @ WES | 62.44 |
| ht | 38.98 | Line AIRWAYHT (48009) TO GARDENSP (48131) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Coulee - Westside 230kV and Nine Mile - Westside 115kV | 62.35 |
| ht | 41.13 | Line AIRWAYHT (48009) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV Open @ NMS | -62.44 |
| ht | 41.3 | Line AIRWAYHT (48009) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV | -62.44 |
| hs | 42.44 | Line NINEMILE (48269) TO INDTRAIL (48164) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV Open @ DGP | 65.77 |
| hs | 44.63 | Line NINEMILE (48269) TO INDTRAIL (48164) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV | 65.77 |
| ht | 44.68 | Line AIRWAYHT (48009) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | PSF: Westside 115 kV | -60.74 |
| ht | 46.1 | Line AIRWAYHT (48009) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV Open @ WES | -62.44 |
| hs | 46.32 | Line NINEMILE (48269) TO INDTRAIL (48164) CKT 1[115.00 - 115.00 kV] | BF: A180 Airway Heights 115 kV, Airway Heights-Devils Gap | 65.77 |
| ht | 46.35 | Line AIRWAYHT (48009) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Coulee - Westside 230kV and Nine Mile - Westside 115kV | -62.35 |
| hs | 46.38 | Line NINEMILE (48269) TO INDTRAIL (48164) CKT 1[115.00 - 115.00 kV] | PSF: Airway Heights 115 kV | 65.77 |
| hs | 46.64 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Coulee - Westside 230kV and Nine Mile - Westside 115kV | 62.35 |
| hs | 46.67 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV Open @ NMS | 62.45 |
| hs | 46.98 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV | 62.45 |
| hs | 48.6 | Line DEVILGPE (48103) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | BUS: Westside 115 kV | 60.75 |
| hs | 56.53 | Line AIRWAYHT (48009) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | PSF: Westside 115 kV | -60.14 |
| ht | 56.57 | Line DEVILGPE (48103) TO NINEMILE (48269) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV Open @ DGP | 65.77 |
| hs | 57.61 | Line NINEMILE (48269) TO INDTRAIL (48164) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV Open @ AIR | 65.77 |
| ht | 58.07 | Line DEVILGPE (48103) TO NINEMILE (48269) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV | 65.77 |
| hs | 58.28 | Line AIRWAYHT (48009) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | BF: A413 Westside 115 kV, Ninemile-Westside | -60.75 |
| ht | 58.92 | Line DEVILGPE (48103) TO NINEMILE (48269) CKT 1[115.00 - 115.00 kV] | BF: A180 Airway Heights 115 kV, Airway Heights-Devils Gap | 65.77 |
| ht | 58.92 | Line DEVILGPE (48103) TO NINEMILE (48269) CKT 1[115.00 - 115.00 kV] | PSF: Airway Heights 115 kV | 65.77 |
| hs | 59.85 | Line INDTRAIL (48164) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV Open @ DGP | 65.77 |
| hs | 62.25 | Line INDTRAIL (48164) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV | 65.77 |
| hs | 63.91 | Line INDTRAIL (48164) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | BF: A180 Airway Heights 115 kV, Airway Heights-Devils Gap | 65.77 |
| hs | 63.91 | Line INDTRAIL (48164) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | PSF: Airway Heights 115 kV | 65.77 |
| hs | 67.15 | Line AIRWAYHT (48009) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV Open @ NMS | -62.45 |
| ht | 67.21 | Line DEVILGPE (48103) TO NINEMILE (48269) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV Open @ AIR | 65.77 |
| hs | 67.62 | Line AIRWAYHT (48009) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-2 (ADJ): Coulee - Westside 230kV and Nine Mile - Westside 115kV | -62.35 |
| hs | 67.96 | Line AIRWAYHT (48009) TO W.PLAINS (47513) CKT 1[115.00 - 115.00 kV] | N-1 Nine Mile - Westside 115 kV | -62.45 |
| hs | 74.67 | Line INDTRAIL (48164) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | N-1 Airway Heights - Devils Gap 115 kV Open @ AIR | 65.77 |

TABLE 20: NEW FACILITY THERMAL VIOLATIONS FOR 68 MW REQUEST

| Label | Element | Percent | Case |
|--|---|---------|------|
| N-1 Devils Gap - Long Lake #2 115 kV | LONGLAKE (48201) -> DEVILGPE (48103) CKT 1at LONGLAKE | 130.97 | hs |
| N-1 Devils Gap - Long Lake #1 115 kV | LONGLAKW (48199) -> DEVILGPE (48103) CKT 1at LONGLAKW | 130.95 | hs |
| N-1 Devils Gap - Long Lake #2 115 kV | LONGLAKE (48201) -> DEVILGPE (48103) CKT 1at LONGLAKE | 125.79 | ht |
| N-1 Devils Gap - Long Lake #1 115 kV | LONGLAKW (48199) -> DEVILGPE (48103) CKT 1at LONGLAKW | 125.78 | ht |
| N-1 Airway Heights - Devils Gap 115 kV Open @ DGP | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 124.01 | ht |
| N-1 Airway Heights - Devils Gap 115 kV | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 123.88 | ht |
| BF: A180 Airway Heights 115 kV, Airway Heights-Devils Gap | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 123.51 | ht |
| PSF: Airway Heights 115 kV | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 123.51 | ht |
| N-1 Airway Heights - Devils Gap 115 kV Open @ DGP | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 121.13 | ht |
| N-1 Airway Heights - Devils Gap 115 kV | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 121 | ht |
| PSF: Airway Heights 115 kV | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 120.6 | ht |
| BF: A180 Airway Heights 115 kV, Airway Heights-Devils Gap | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 120.6 | ht |
| N-1 Airway Heights - Devils Gap 115 kV Open @ AIR | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 119.94 | ht |
| BUS: Airway Heights 115 kV | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 119.54 | ht |
| N-1 Airway Heights - Devils Gap 115 kV Open @ AIR | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 117.06 | ht |
| N-1 Nine Mile - Westside 115 kV Open @ NMS | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 116.91 | ht |
| N-1 Nine Mile - Westside 115 kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 116.85 | ht |
| BUS: Airway Heights 115 kV | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 116.64 | ht |
| PSF: Westside 115 kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 116.4 | ht |
| N-1 Nine Mile - Westside 115 kV Open @ WES | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 115.4 | ht |
| N-2 (ADJ): Coulee - Westside 230kV and Nine Mile - Westside 115kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 114.99 | ht |
| BF: A413 Westside 115 kV, Ninemile-Westside | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 114.79 | ht |
| N-1 Nine Mile - Westside 115 kV Open @ NMS | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 114.76 | ht |
| N-1 Nine Mile - Westside 115 kV | AIRWAYHT (48009) -> GARDENSP (48131) CKT 1at AIRWAYHT | 114.64 | ht |
| PSF: Westside 115 kV | AIRWAYHT (48009) -> GARDENSP (48131) CKT 1at AIRWAYHT | 114.57 | ht |
| BUS: Westside 115 kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 113.35 | hs |
| BF: A413 Westside 115 kV, Ninemile-Westside | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 112.95 | ht |
| PSF: Westside 115 kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 112.87 | hs |
| BF: A470 Westside 115 kV, College & Walnut-Westside | AIRWAYHT (48009) -> GARDENSP (48131) CKT 1at AIRWAYHT | 112.67 | ht |
| N-1 Nine Mile - Westside 115 kV Open @ WES | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 112.67 | ht |
| N-2 (ADJ): Coulee - Westside 230kV and Nine Mile - Westside 115kV | AIRWAYHT (48009) -> GARDENSP (48131) CKT 1at AIRWAYHT | 112.28 | ht |
| BF: A413 Westside 115 kV, Ninemile-Westside | AIRWAYHT (48009) -> GARDENSP (48131) CKT 1at AIRWAYHT | 112.07 | ht |
| N-1 Nine Mile - Westside 115 kV Open @ NMS | AIRWAYHT (48009) -> GARDENSP (48131) CKT 1at AIRWAYHT | 111.91 | ht |
| N-1 Nine Mile - Westside 115 kV | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 111.27 | ht |
| N-1 Airway Heights - Devils Gap 115 kV Open @ DGP | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 111.21 | ht |
| N-1 Airway Heights - Devils Gap 115 kV | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 110.56 | hs |
| PSF: Westside 115 kV | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 110.37 | hs |
| BF: A180 Airway Heights 115 kV, Airway Heights-Devils Gap | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 109.78 | ht |
| PSF: Airway Heights 115 kV | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 109.7 | hs |
| BUS: Westside 115 kV | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 109.7 | hs |
| N-1 Airway Heights - Garden Springs 115 kV | AIRWAYHT (48009) -> GARDENSP (48131) CKT 1at AIRWAYHT | 109.69 | ht |
| N-2: Airway Heights - Garden Springs 115 kV and Garden Springs - Westside 115 kV | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 109.64 | ht |
| N-1 Nine Mile - Westside 115 kV Open @ WES | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 109.48 | ht |
| N-1 Nine Mile - Westside 115 kV Open @ NMS | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 109.35 | ht |
| BF: A470 Westside 115 kV, College & Walnut-Westside | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 109.33 | hs |
| N-2 (ADJ): Coulee - Westside 230kV and Nine Mile - Westside 115kV | AIRWAYHT (48009) -> GARDENSP (48131) CKT 1at AIRWAYHT | 109.32 | ht |
| N-1 Nine Mile - Westside 115 kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 109.26 | hs |
| N-2 (ADJ): Coulee - Westside 230kV and Nine Mile - Westside 115kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 109.19 | hs |
| BF: A413 Westside 115 kV, Ninemile-Westside | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 109.14 | ht |
| BUS: Westside 115 kV | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 109.14 | ht |
| BF: A470 Westside 115 kV, College & Walnut-Westside | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 108.26 | hs |
| BUS: Westside 115 kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 107.77 | ht |
| BF: A470 Westside 115 kV, College & Walnut-Westside | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 107.33 | ht |
| N-1 Airway Heights - Garden Springs 115 kV | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 107.06 | ht |
| N-2: Airway Heights - Garden Springs 115 kV and Garden Springs - Westside 115 kV | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 106.74 | ht |
| PSF: Westside 115 kV | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 106.57 | ht |
| BF: A413 Westside 115 kV, Ninemile-Westside | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 105.42 | hs |
| N-1 Airway Heights - Devils Gap 115 kV Open @ DGP | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 105.03 | hs |
| N-1 Airway Heights - Devils Gap 115 kV Open @ AIR | DEVILGPE (48103) -> NINEMILE (48269) CKT 1at DEVILGPE | 104.82 | ht |
| N-1 Airway Heights - Devils Gap 115 kV Open @ AIR | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 104.77 | hs |
| BUS: Nine Mile 115 kV | DEVILGPE (48103) -> NINEMILE (48269) CKT 1at DEVILGPE | 104.69 | ht |
| N-1 Nine Mile - Westside 115 kV Open @ WES | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 104.5 | ht |
| PSF: Nine Mile 115 kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 104.46 | ht |
| BF: A655 Ninemile 115 kV, Ninemile-Westside | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 104.44 | ht |
| PSF: Airway Heights 115 kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 104.29 | ht |
| BF: A180 Airway Heights 115 kV, Airway Heights-Devils Gap | DEVILGPE (48103) -> NINEMILE (48269) CKT 1at DEVILGPE | 104.29 | ht |
| BUS: Airway Heights 115 kV | NINEMILE (48269) -> INDTRAIL (48164) CKT 1at NINEMILE | 104.1 | hs |
| N-1 Devils Gap - Nine Mile 115 kV | DEVILGPE (48103) -> W.PLAINS (47513) CKT 1at DEVILGPE | 104.04 | ht |
| N-1 Airway Heights - Devils Gap 115 kV Open @ DGP | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 103.57 | ht |
| N-1 Airway Heights - Devils Gap 115 kV | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 103.4 | hs |
| PSF: Airway Heights 115 kV | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 102.69 | hs |
| BF: A180 Airway Heights 115 kV, Airway Heights-Devils Gap | INDTRAIL (48164) -> WEST (48461) CKT 1at INDTRAIL | 102.69 | hs |
| N-1 Nine Mile - Westside 115 kV Open @ NMS | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 101.58 | hs |
| N-2 (ADJ): Coulee - Westside 230kV and Nine Mile - Westside 115kV | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 101.48 | hs |
| N-1 Nine Mile - Westside 115 kV | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 101.45 | hs |
| N-1 Airway Heights - Devils Gap 115 kV Open @ AIR | DEVILGPE (48103) -> NINEMILE (48269) CKT 1at DEVILGPE | 100.72 | ht |
| BUS: Westside 115 kV | W.PLAINS (47513) -> AIRWAYHT (48009) CKT 1at W.PLAINS | 100.42 | hs |
| BUS: Airway Heights 115 kV | DEVILGPE (48103) -> NINEMILE (48269) CKT 1at DEVILGPE | 100.32 | ht |

Project Alternatives; \$19.7 million

The level of generation requested at Long Lake can be integrated with the following projects:

1. Construct a new 115 kV transmission line between Reardan and Silver Lake
 - a. Build a new 3 position 115 kV station at Reardan; \$4 million
 - b. Build a new 4 position 115 kV station at Silver Lake; \$5 million
 - c. Construct 18 miles of 115 kV transmission line with a minimum summer rating of 138 MVA between the new stations; \$7.56 million
2. Rebuild 15.7 miles of existing 115 kV transmission line to minimum summer rating of 205 MVA; \$3.14 million

Monroe Street

Monroe Street 80 MW; \$7 million

This request involves adding 80 MW at Monroe Street, which is modeled in this study as a single generator at Post Street station as shown in Figure 12.

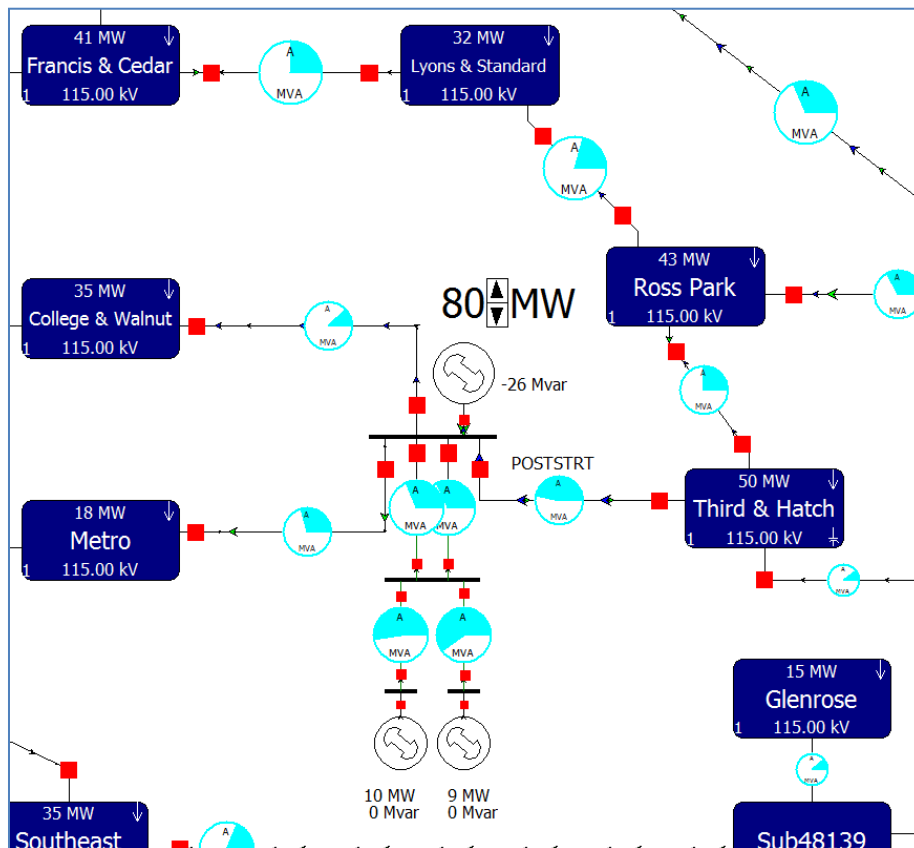


FIGURE 12: MONROE STREET GENERATION REQUEST; 2024 HEAVY SUMMER CASE

Analysis

For P0 conditions, both study cases received generation up to 80 MW without issue.

For performance during contingencies, Table 21 shows results from the ATC analysis. No new facility violations were discovered for the requested generation.

TABLE 21: ATC RESULTS FOR MONROE STREET GENERATION REQUEST

| Case | Trans Lim | Limiting Element | Limiting CTG | % ODF |
|------|-----------|---|---|--------|
| hs | 146.85 | Line POSTSTRT (48339) TO THIRHACH (48431) CKT 1[115.00 - 115.00 kV] | PSF: Sunset 115 kV | 72.49 |
| hs | 148.05 | Line POSTSTRT (48339) TO THIRHACH (48431) CKT 1[115.00 - 115.00 kV] | BUS: Metro 115 kV | 72.82 |
| hs | 148.65 | Line POSTSTRT (48339) TO THIRHACH (48431) CKT 1[115.00 - 115.00 kV] | N-1: Metro - Post Street 115 kV | 72.82 |
| hs | 151.06 | Line POSTSTRT (48339) TO THIRHACH (48431) CKT 1[115.00 - 115.00 kV] | N-1: Metro - Sunset 115 kV | 72.82 |
| hs | 157.62 | Line POSTSTRT (48339) TO THIRHACH (48431) CKT 1[115.00 - 115.00 kV] | BUS: Sunset 115 kV | 72.49 |
| hs | 194.06 | Line METRO (48225) TO SUNSET (48421) CKT 1[115.00 - 115.00 kV] | N-1: Post Street - Third & Hatch 115 kV | 60.99 |
| hs | 208.98 | Line METRO (48225) TO SUNSET (48421) CKT 1[115.00 - 115.00 kV] | BUS: Third & Hatch 115 kV | 60.85 |
| hs | 243.87 | Line METRO (48225) TO POSTSTRT (48339) CKT 1[115.00 - 115.00 kV] | N-1: Post Street - Third & Hatch 115 kV | -60.99 |
| hs | 246.2 | Line METRO (48225) TO POSTSTRT (48339) CKT 1[115.00 - 115.00 kV] | BUS: Third & Hatch 115 kV | -60.85 |
| ht | 281.68 | Line SPKWASTE (48409) TO WEST (48461) CKT 1[115.00 - 115.00 kV] | BUS: Post Street 115 kV | -41.32 |

Project Alternatives

While the study connected the new generation at Post Street station, this is not a feasible POI. The POI for this request would be chosen as College and Walnut Station, and this would cost an estimated \$7 million

Post Falls

Post Falls 10 to 22 MW; \$2.1 to \$5.2 million

This request involves adding from 10 to 22 MW at Post Falls, which is modeled in this study as a single generator at Post Falls 115 kV bus as shown in.

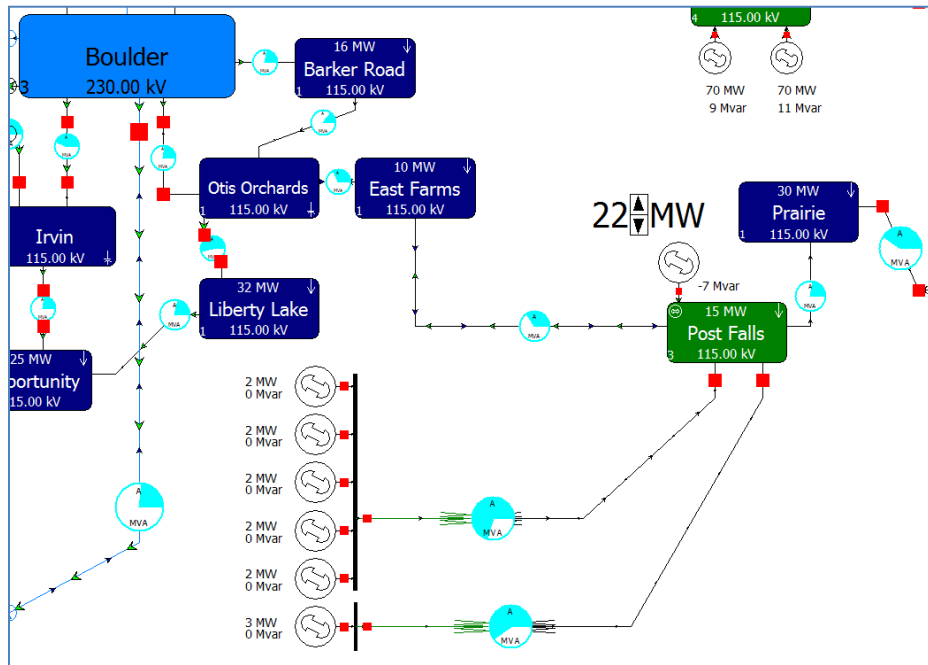


FIGURE 13: POST FALLS GENERATION REQUEST; 2024 HEAVY SUMMER CASE

Analysis

For P0 conditions, both study cases received generation up to 22 MW without issue.

For performance during contingencies, two 115 kV transmission line segments present issues:

- 10 MW request; East Farms – Post Falls 115 kV segment overloads
- 22 MW request; Otis Orchards – Post Falls 115 kV Transmission Line overloads

Project Alternatives

- 10 MW Request - rebuild East Farms – Post Falls line to minimum summer rating of 160 MVA for \$2.01 million
- 22 MW Request – above project in addition to rebuilding the Otis Orchard – Post Falls 115 kV Transmission Line to minimum summer rating of 170 MVA for \$3.2 million

Appendix A

Future projects included in this analysis

| 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: <ol style="list-style-type: none"> 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 MVA 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 a minimum 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 |

Appendix B

New facility violations for Kootenai 350 MW request

| Label | Element | Percent | Case |
|--|--|---------|------|
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 138.25 | hs |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 134.6 | hs |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | BELLAN11 (90011) -> BELL S3 (40090) CKT 1 at BELLAN11 | 130.67 | ht |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 127.9 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | POST FLS (48329) -> EASTFARM (48117) CKT 1 at POST FLS | 124.08 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 123.57 | hs |
| N-1: Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 121.95 | ht |
| N-1: Lancaster - Rathdrum 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 121.42 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 121.16 | ht |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 120.41 | ht |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 120.19 | ht |
| N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 119.82 | ht |
| N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 119.73 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | EASTFARM (48117) -> OTIS (48311) CKT 1 at EASTFARM | 119.58 | ht |
| N-1: Boulder - Lancaster 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 118.9 | ht |
| BF: R427 Beacon North & South 230 kV | SPKINDPK (48405) -> IRVIN (48165) CKT 1 at IRVIN | 118.86 | hs |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 118.14 | ht |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 117.36 | ht |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 117.2 | ht |
| BF: R508 Lancaster-Rathdrum, Rathdrum #1 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 115.91 | ht |
| N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 115.77 | hs |
| N-2 (STR): Beacon - Boulder 230 kV & Beacon - Kootenai 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 115.38 | hs |
| N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder #1 115kV | BOULDERE (48522) -> IRVIN (48165) CKT 1 at BOULDERE | 114.84 | ht |
| BF: A1561 Boulder-Lancaster, Lancaster Generator #1 & #2 | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 114.8 | ht |
| BF: A1186 Lancaster-Noxon, Boulder-Lancaster | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 114.62 | ht |
| BF: A1558 Bell-Lancaster, Lancaster-Rathdrum | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 114.55 | ht |
| N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 114.15 | hs |
| N-1: Lancaster - Rathdrum 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 113.6 | ht |
| BUS: Beacon North 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 113.53 | ht |
| N-1: Beacon - Boulder 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 113.26 | ht |
| BF: R408 Lancaster-Rathdrum, Rathdrum #2 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 113.03 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 112.69 | hs |
| N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 111.93 | ht |
| N-1: Beacon - Kootenai 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 111.76 | ht |
| BUS: Beacon North 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 111.71 | ht |
| N-1: Opportunity - Otis Orchards 115 kV Open @ OTI | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 111.67 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | RAMSEY (48349) -> PRAIRIEB (40855) CKT 1 at RAMSEY | 110.91 | hs |
| N-2 (ADJ): Beacon - Boulder #2 115 kV and Beacon - Ninth & Central #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 110.78 | hs |
| N-2 (ADJ): Beacon - Bell #4 230kV and Beacon - Kootenai 230kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 110.66 | ht |
| PSF: Ramsey 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 110.59 | ht |
| N-1: Lancaster - Rathdrum 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 110.58 | ht |
| BF: A600 Beacon North & South 115 kV | OPPORTUN (48299) -> CHESTER (48069) CKT 1 at CHESTER | 109.39 | hs |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 109.18 | hs |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 109.16 | hs |
| N-1: Opportunity - Otis Orchards 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 109.13 | ht |
| N-1: Boulder - Lancaster 230 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 109.13 | ht |
| N-2 (ADJ): Beacon - Bell #4 230kV and Beacon - Kootenai 230kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 108.94 | ht |
| N-1: Beacon - Kootenai 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 108.92 | ht |
| N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 108.9 | ht |
| N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | POST FLS (48329) -> EASTFARM (48117) CKT 1 at POST FLS | 108.68 | ht |
| N-2: Beacon - Boulder 230 kV & Beacon - Irvin #1 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 108.48 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 108.16 | ht |
| BF: R508 Lancaster-Rathdrum, Rathdrum #1 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 108.06 | ht |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 107.89 | ht |
| N-2 (ADJ): Bell - Coulee #6 500 kV and Bell - Creston 115 kV | WEST (48463) -> WESTBPA2 (41276) CKT 1 at WESTBPA2 | 107.8 | ht |
| N-1: Boulder - Lancaster 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 107.74 | hs |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 107.69 | ht |
| BF: A667 Ramsey 115 kV, Appleyway-Ramsey | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 107.57 | ht |
| BF: A668 Ramsey 115 kV, Ramsey-Rathdrum #1 | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 107.51 | ht |
| BF: A717 Boulder East & West 115 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 107.31 | ht |
| N-2 (STR): Beacon - Boulder 230 kV & Beacon - Kootenai 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 107.07 | ht |
| BF: A1561 Boulder-Lancaster, Lancaster Generator #1 & #2 | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 107.05 | ht |



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| BF: R427 Beacon North & South 230 kv | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 106.95 | ht |
| N-1: Opportunity - Otis Orchards 115 kv Open @ OPT | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 106.89 | ht |
| BF: A645 Otis Orchards 115 kv, Boulder-Otis Orchards | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 106.89 | ht |
| BF: A645 Otis Orchards 115 kv, Boulder-Otis Orchards | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 106.88 | hs |
| BF: A1186 Lancaster-Noxon, Boulder-Lancaster | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 106.85 | ht |
| BF: A1558 Bell-Lancaster, Lancaster-Rathdrum | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 106.78 | ht |
| N-1: Post Falls - Ramsey 115 kv Open @ RAM | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 106.72 | ht |
| BUS: Ramsey 115 kv | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 106.67 | ht |
| BUS: Beacon North 230 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 106.61 | hs |
| N-2 (STR): Post Falls - Ramsey 115 kv & Ramsey - Rathdrum #1 115 kv | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 106.31 | ht |
| BF: 4122 Bell-Taft, Hot Springs-Taft | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 106.28 | ht |
| BF: R452 Beacon-Boulder, Boulder #2 230/115 Transformer | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 105.77 | ht |
| N-1: Boulder - Irvin #2 115 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 105.72 | hs |
| BF: A642 Otis Orchards 115 kv, Otis Orchards-Post Falls | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 105.57 | ht |
| N-1: Opportunity - Otis Orchards 115 kv Open @ OTI | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 105.54 | hs |
| BF: A211 Post Falls 115 kv, Post Falls-Ramsey | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 105.37 | ht |
| N-1: Post Falls - Ramsey 115 kv | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 105.37 | ht |
| BF: A669 Ramsey 115 kv, Post Falls-Ramsey | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 105.34 | ht |
| BUS: Otis Orchards 115 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 105.29 | ht |
| BF: R408 Lancaster-Rathdrum, Rathdrum #2 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 105.16 | ht |
| BF: R552 Beacon-Boulder, Boulder #1 230/115 Transformer | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 105.04 | ht |
| BF: R508 Lancaster-Rathdrum, Rathdrum #1 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 105.02 | ht |
| BF: A506 Rathdrum 115 kv, Pine Street-Rathdrum | RATHDRMW (48355) -> HUETTER (48159) CKT 1 at HUETTER | 104.87 | hs |
| PSF: Post Falls 115 kv | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 104.86 | ht |
| PSF: Otis Orchards 115 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 104.75 | ht |
| BUS: Rathdrum East 115 kv | RATHDRMW (48355) -> HUETTER (48159) CKT 1 at HUETTER | 104.72 | hs |
| BF: A642 Otis Orchards 115 kv, Otis Orchards-Post Falls | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 104.5 | hs |
| N-2 (STR): Boulder - Lancaster 230 kv & Boulder - Rathdrum 115 kv | EASTFARM (48117) -> OTIS (48311) CKT 1 at EASTFARM | 104.3 | ht |
| BF: A1561 Boulder-Lancaster, Lancaster Generator #1 & #2 | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 104.04 | ht |
| BUS: Otis Orchards 115 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 104.02 | hs |
| N-1: Beacon - Kootenai 230 kv | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 103.89 | ht |
| BF: A1186 Lancaster-Noxon, Boulder-Lancaster | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 103.84 | ht |
| BUS: Beacon North 230 kv | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 103.84 | ht |
| BF: R427 Beacon North & South 230 kv | LANCASTR (40624) -> BELLAN11 (90011) CKT 1 at BELLAN11 | 103.83 | ht |
| N-1: Bell - Coulee #6 500 kv | WEST (48463) -> WESTBPA2 (41276) CKT 1 at WESTBPA2 | 103.79 | ht |
| BF: A1558 Bell-Lancaster, Lancaster-Rathdrum | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 103.76 | ht |
| N-2 (STR): Beacon - Boulder 230 kv & Beacon - Kootenai 230 kv | LANCASTR (40624) -> BELLAN11 (90011) CKT 1 at BELLAN11 | 103.71 | ht |
| N-2 (ADJ): Beacon - Francis & Cedar 115kv and Bell - Coulee #6 500kv | WEST (48463) -> WESTBPA2 (41276) CKT 1 at WESTBPA2 | 103.68 | ht |
| N-1: Boulder - Lancaster 230 kv | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 103.58 | ht |
| BUS: Post Falls 115 kv | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 103.25 | ht |
| N-1: Otis Orchards - Post Falls 115 kv Open @ PF | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 103.24 | ht |
| N-1: Post Falls - Ramsey 115 kv Open @ PF | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 103.24 | ht |
| PSF: Ramsey 115 kv | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 102.97 | ht |
| BF: A641 Otis Orchards 115 kv, Opportunity-Otis Orchards | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.88 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 102.85 | ht |
| N-2 (ADJ): Beacon - Bell #4 230kv and Beacon - Kootenai 230kv | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 102.8 | ht |
| BF: A688 Ninth & Central North & South 115 kv | ROSSPARK (48371) -> THIRHACH (48431) CKT 1 at ROSSPARK | 102.78 | hs |
| N-1: Otis Orchards - Post Falls 115 kv | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.75 | ht |
| BF: A324 Post Falls 115 kv, Otis Orchards-Post Falls | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.73 | ht |
| BF: 4119 Bell-Taft, Garrison-Taft #1 | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.67 | ht |
| BF: AXXX Bell S0 & S1 230 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.6 | ht |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 102.43 | ht |
| N-1: Bell - Taft 500 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.35 | ht |
| N-2 (STR): Bell - Coulee #3 230 kv & Bell - Westside 230 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.21 | ht |
| BF: R408 Lancaster-Rathdrum, Rathdrum #2 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 102.12 | ht |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 102.05 | ht |
| N-1: Otis Orchards - Post Falls 115 kv Open @ OTI | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.94 | ht |
| BF: AXXX Irvin - IEP 115 kv, Boulder - Irvin #2 115 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.84 | ht |
| N-1: Lancaster - Rathdrum 230 kv | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 101.55 | ht |
| N-1: Bell - Westside 230 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.48 | ht |
| BF: R427 Beacon North & South 230 kv | BELLAN11 (90011) -> BELL S3 (40090) CKT 1 at BELLAN11 | 101.46 | ht |
| PSF: Otis Orchards 115 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.46 | hs |
| N-2 (STR): Beacon - Boulder 230 kv & Beacon - Kootenai 230 kv | BELLAN11 (90011) -> BELL S3 (40090) CKT 1 at BELLAN11 | 101.35 | ht |
| BF: R476 Benewah-Moscow 230, Benewah 230/115 Transformer | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.1 | ht |
| N-2: Ninth & Central - Opportunity 115 kv & Opportunity - Otis Orchards 115 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.09 | ht |
| BF: A388 Bell S2 & S3 230 kv | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 100.95 | ht |
| BUS: Boulder West 115 kv | BOULDERE (48522) -> IRVIN (48165) CKT 1 at BOULDERE | 100.85 | hs |
| N-1: Beacon - Kootenai 230 kv | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 100.84 | ht |



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| N-2 (ADJ): Bell - Coulee #6 500kV and Bell - Westside 230kV | FRANCEDR (48127) -> NORTHWES (48279) CKT 1 at FRANCEDR | 100.81 | ht |
| BUS: Beacon North 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 100.8 | ht |
| N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 100.74 | ht |
| N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | RAMSEY (48349) -> PRAIRIEB (40855) CKT 1 at RAMSEY | 100.74 | hs |
| BF: A638 Rathdrum 115 kV, Appleway-Rathdrum | RATHDRMW (48355) -> HUETTER (48159) CKT 1 at HUETTER | 100.6 | hs |
| N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 100.41 | hs |
| N-2 (STR): Beacon - Boulder 230 kV & Beacon - Kootenai 230 kV | IRVIN (48165) -> MILLWOOD (48237) CKT 1 at IRVIN | 100.4 | ht |
| BF: A642 Otis Orchards 115 kV, Otis Orchards-Post Falls | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.37 | ht |
| N-2 (ADJ): Bell - Taft 500 kV and Lancaster - Noxon 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 100.31 | ht |
| BF: A370 Bell S1 & S2 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 100.16 | ht |
| BF: R427 Beacon North & South 230 kV | IRVIN (48165) -> MILLWOOD (48237) CKT 1 at IRVIN | 100.1 | ht |

Appendix C

New facility thermal violations for Rathdrum 200 MW request; 115 kV option

| Label | Element | Percent | Case |
|---|--|---------|------|
| N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 146.18 | hs |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 134.09 | hs |
| N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 133.17 | hs |
| N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | EASTFARM (48117) -> OTIS (48311) CKT 1 at EASTFARM | 131.81 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 130.46 | hs |
| N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 129.6 | hs |
| N-1: Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 126.81 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 126 | ht |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 125.09 | ht |
| N-1: Boulder - Lancaster 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 123.81 | ht |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 123.54 | ht |
| BF: R408 Lancaster-Rathdrum, Rathdrum #2 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 123.32 | ht |
| PSF: Ramsey 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 123.28 | ht |
| BF: R400 Kootenai-Rathdrum, Rathdrum #2 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 123.14 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 123.03 | ht |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 122.08 | ht |
| BF: R508 Lancaster-Rathdrum, Rathdrum #1 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 121.53 | ht |
| BF: R500 Kootenai-Rathdrum, Rathdrum #1 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 120.97 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 120.23 | hs |
| BF: A667 Ramsey 115 kV, Appleway-Ramsey | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 120.22 | ht |
| BF: A668 Ramsey 115 kV, Ramsey-Rathdrum #1 | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 120.16 | ht |
| BF: A1186 Lancaster-Noxon, Boulder-Lancaster | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 119.38 | ht |
| BUS: Ramsey 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 119.31 | ht |
| N-1: Post Falls - Ramsey 115 kV Open @ RAM | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 119.29 | ht |
| N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 119.22 | hs |
| N-2 (STR): Post Falls - Ramsey 115 kV & Ramsey - Rathdrum #1 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 119 | ht |
| BF: A1561 Boulder-Lancaster, Lancaster Generator #1 & #2 | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 118.79 | ht |
| N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 118.16 | ht |
| BF: A669 Ramsey 115 kV, Post Falls-Ramsey | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 118 | ht |
| N-1: Lancaster - Rathdrum 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 117.96 | ht |
| N-1: Post Falls - Ramsey 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 117.96 | ht |
| BF: A211 Post Falls 115 kV, Post Falls-Ramsey | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 117.78 | ht |
| PSF: Post Falls 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 117.28 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | POST FLS (48329) -> EASTFARM (48117) CKT 1 at POST FLS | 117 | ht |
| BUS: Beacon North 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 116.72 | ht |
| N-1: Beacon - Kootenai 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 116.6 | ht |
| N-1: Kootenai - Rathdrum 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 116.58 | ht |
| N-1: Post Falls - Ramsey 115 kV Open @ PF | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 115.87 | ht |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 115.86 | ht |
| PSF: Ramsey 115 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 115.76 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 115.76 | hs |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 115.73 | hs |
| N-2 (ADJ): Beacon - Bell #4 230kV and Beacon - Kootenai 230kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 115.72 | ht |
| BUS: Post Falls 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 115.69 | ht |
| BF: R408 Lancaster-Rathdrum, Rathdrum #2 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 115.45 | ht |
| N-1: Otis Orchards - Post Falls 115 kV Open @ PF | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 115.43 | ht |
| BF: R400 Kootenai-Rathdrum, Rathdrum #2 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 115.29 | ht |
| BF: A324 Post Falls 115 kV, Otis Orchards-Post Falls | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 115.2 | ht |
| N-1: Otis Orchards - Post Falls 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 114.95 | ht |
| N-1: Boulder - Lancaster 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 114.52 | hs |
| BF: A717 Boulder East & West 115 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 114.42 | ht |
| N-1: Otis Orchards - Post Falls 115 kV Open @ OTI | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 114.15 | ht |
| BF: R508 Lancaster-Rathdrum, Rathdrum #1 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 113.66 | ht |
| N-2 (STR and ADJ): Beacon - Boulder 230 kV & Beacon - Boulder #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 113.38 | hs |
| BF: R500 Kootenai-Rathdrum, Rathdrum #1 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 113.13 | ht |
| N-1: Boulder - Lancaster 230 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 113.12 | ht |
| BF: R427 Beacon North & South 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 112.91 | ht |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 112.87 | ht |
| PSF: Ramsey 115 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 112.81 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | LANCASTR (40624) -> BELLAN11 (90011) CKT 1 at BELLAN11 | 112.74 | ht |
| BF: A667 Ramsey 115 kV, Appleway-Ramsey | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 112.71 | ht |
| BF: A668 Ramsey 115 kV, Ramsey-Rathdrum #1 | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 112.64 | ht |



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| N-2 (STR): Beacon - Boulder 230 kV & Beacon - Kootenai 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 112.58 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | EASTFARM (48117) -> OTIS (48311) CKT 1 at EASTFARM | 112.57 | ht |
| BF: R408 Lancaster-Rathdrum, Rathdrum #2 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 112.41 | ht |
| BF: A642 Otis Orchards 115 kV, Otis Orchards-Post Falls | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 112.4 | ht |
| BF: R400 Kootenai-Rathdrum, Rathdrum #2 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 112.26 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 112.15 | ht |
| BUS: Ramsey 115 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 111.8 | ht |
| BF: A1186 Lancaster-Noxon, Boulder-Lancaster | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 111.8 | ht |
| N-1: Post Falls - Ramsey 115 kV Open @ RAM | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 111.72 | ht |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 111.72 | ht |
| BUS: Otis Orchards 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 111.59 | ht |
| N-2: Beacon - Boulder 230 kV & Boulder - Irvin #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 111.53 | hs |
| N-2 (STR): Post Falls - Ramsey 115 kV & Ramsey - Rathdrum #1 115 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 111.45 | ht |
| BF: A1558 Bell-Lancaster, Lancaster-Rathdrum | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 111.34 | ht |
| BUS: Beacon South 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 111.31 | ht |
| BF: A1561 Boulder-Lancaster, Lancaster Generator #1 & #2 | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 111.2 | ht |
| N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | POST FLS (48329) -> EASTFARM (48117) CKT 1 at POST FLS | 110.91 | ht |
| BF: A641 Otis Orchards 115 kV, Opportunity-Otis Orchards | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 110.82 | ht |
| BF: A645 Otis Orchards 115 kV, Boulder-Otis Orchards | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 110.72 | ht |
| PSF: Otis Orchards 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 110.71 | ht |
| BF: R508 Lancaster-Rathdrum, Rathdrum #1 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 110.63 | ht |
| N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 110.55 | ht |
| BF: A669 Ramsey 115 kV, Post Falls-Ramsey | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 110.51 | ht |
| N-1: Post Falls - Ramsey 115 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 110.4 | ht |
| N-2 (ADJ): Beacon - Boulder 230kV and Beacon - Boulder #1 115kV | BOULDERE (48522) -> IRVIN (48165) CKT 1 at BOULDERE | 110.25 | ht |
| BF: A211 Post Falls 115 kV, Post Falls-Ramsey | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 110.24 | ht |
| N-1: Lancaster - Rathdrum 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 110.18 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | BELLAN11 (90011) -> BELL S3 (40090) CKT 1 at BELLAN11 | 110.16 | ht |
| BF: R500 Kootenai-Rathdrum, Rathdrum #1 230/115 Transformer | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 110.1 | ht |
| BF: A506 Rathdrum 115 kV, Pine Street-Rathdrum | RATHDRMW (48355) -> HUETTER (48159) CKT 1 at HUETTER | 110.08 | hs |
| BF: R427 Beacon North & South 230 kV | SPKINDPK (48405) -> IRVIN (48165) CKT 1 at IRVIN | 110.04 | hs |
| BUS: Rathdrum East 115 kV | RATHDRMW (48355) -> HUETTER (48159) CKT 1 at HUETTER | 109.93 | hs |
| N-2 (ADJ): Beacon - Boulder #2 115 kV and Beacon - Ninth & Central #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 109.81 | hs |
| PSF: Post Falls 115 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 109.75 | ht |
| BF: A667 Ramsey 115 kV, Appleway-Ramsey | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 109.75 | ht |
| BF: A668 Ramsey 115 kV, Ramsey-Rathdrum #1 | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 109.69 | ht |
| N-1: Opportunity - Otis Orchards 115 kV Open @ OTI | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 109.12 | ht |
| BUS: Beacon North 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 109.03 | ht |
| N-1: Beacon - Boulder 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 108.94 | ht |
| N-1: Beacon - Kootenai 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 108.9 | ht |
| N-1: Kootenai - Rathdrum 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 108.89 | ht |
| N-1: Rathdrum #2 230/115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 108.88 | ht |
| BUS: Ramsey 115 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 108.85 | ht |
| N-1: Benewah - Pine Creek 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 108.83 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 108.83 | hs |
| BF: A1186 Lancaster-Noxon, Boulder-Lancaster | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 108.83 | ht |
| N-1: Post Falls - Ramsey 115 kV Open @ RAM | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 108.75 | ht |
| N-2 (STR): Post Falls - Ramsey 115 kV & Ramsey - Rathdrum #1 115 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 108.49 | ht |
| BF: R474 Benewah-Pine Creek, Benewah 230/115 Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 108.43 | ht |
| N-1: Post Falls - Ramsey 115 kV Open @ PF | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 108.33 | ht |
| BF: A1561 Boulder-Lancaster, Lancaster Generator #1 & #2 | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 108.23 | ht |
| PSF: Ramsey 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 108.2 | hs |
| BUS: Post Falls 115 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 108.17 | ht |
| N-2 (ADJ): Beacon - Bell #4 230kV and Beacon - Kootenai 230kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 108.03 | ht |
| N-1: Otis Orchards - Post Falls 115 kV Open @ PF | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 107.93 | ht |
| N-2 (ADJ): Bell - Taft 500 kV and Bell - Lancaster 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 107.77 | ht |
| N-2 (STR): Beacon - Kootenai 230 kV & Boulder - Lancaster 230 kV | RAMSEY (48349) -> PRAIRIEB (40855) CKT 1 at RAMSEY | 107.77 | hs |
| N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 107.76 | hs |
| BF: A324 Post Falls 115 kV, Otis Orchards-Post Falls | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 107.68 | ht |
| N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 107.63 | hs |
| N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 107.58 | ht |
| BF: A669 Ramsey 115 kV, Post Falls-Ramsey | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 107.57 | ht |
| BF: A720 Boulder East 115 kV, Boulder-Rathdrum | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 107.54 | ht |
| PSF: Boulder East 115 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 107.54 | ht |
| N-1: Otis Orchards - Post Falls 115 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 107.45 | ht |
| N-1: Post Falls - Ramsey 115 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 107.44 | ht |
| BF: A211 Post Falls 115 kV, Post Falls-Ramsey | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 107.28 | ht |
| BF: A600 Beacon North & South 115 kV | OPPORTUN (48299) -> CHESTER (48069) CKT 1 at CHESTER | 107.21 | hs |



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| N-1: Lancaster - Rathdrum 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 107.17 | ht |
| N-1: Boulder - Lancaster 230 kV | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 107.16 | ht |
| PSF: Post Falls 115 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 106.79 | ht |
| N-1: Otis Orchards - Post Falls 115 kV Open @ OTI | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 106.67 | ht |
| N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | EASTFARM (48117) -> OTIS (48311) CKT 1 at EASTFARM | 106.64 | ht |
| N-1: Opportunity - Otis Orchards 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 106.61 | ht |
| BUS: Beacon North 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 106.6 | ht |
| N-2 (ADJ): Beacon - Kootenai 230kV and Bell - Lancaster 230kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 106.54 | ht |
| N-1: 3TM Bell - Boundary #1 230 kV Open @ BELL | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 106.48 | ht |
| N-2 (STR): Kootenai - Rathdrum 230 kV & Lancaster - Rathdrum 230 kV | RAMSEY (48349) -> PRAIRIEB (40855) CKT 1 at RAMSEY | 106.46 | hs |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 106.43 | ht |
| N-2 (STR): Hot Springs - Noxon #1 230 kV & Hot Springs - Noxon #2 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 106.29 | ht |
| N-2 (STR): Boulder - Lancaster 230 kV & Boulder - Rathdrum 115 kV | RAMSEY (48349) -> PRAIRIEB (40855) CKT 1 at RAMSEY | 106.26 | hs |
| BUS: Beacon North 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 106.03 | ht |
| N-1: Beacon - Kootenai 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 105.9 | ht |
| N-1: Kootenai - Rathdrum 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 105.89 | ht |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | RATHDRMW (48355) -> IDAHO_RD (48161) CKT 1 at RATHDRMW | 105.88 | ht |
| BF: A638 Rathdrum 115 kV, Appleway-Rathdrum | RATHDRMW (48355) -> HUETTER (48159) CKT 1 at HUETTER | 105.83 | hs |
| N-2 (ADJ): Kootenai - Rathdrum 230kV and Lancaster - Noxon 230kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 105.66 | ht |
| BUS: Boulder East 115 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 105.59 | ht |
| BF: AXXX Bell S0 & S1 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 105.46 | ht |
| N-1: Post Falls - Ramsey 115 kV Open @ PF | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 105.37 | ht |
| BUS: Pine Creek 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 105.34 | ht |
| BF: A645 Otis Orchards 115 kV, Boulder-Otis Orchards | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 105.27 | hs |
| N-1: Rathdrum #1 230/115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 105.26 | ht |
| BF: R427 Beacon North & South 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 105.26 | ht |
| BUS: Post Falls 115 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 105.22 | ht |
| N-2 (STR): Beacon - Boulder 230 kV & Beacon - Kootenai 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 105.12 | hs |
| N-1: Opportunity - Otis Orchards 115 kV Open @ OTI | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 105.08 | hs |
| N-2 (ADJ): Beacon - Bell #4 230kV and Beacon - Kootenai 230kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 105.03 | ht |
| N-1: Otis Orchards - Post Falls 115 kV Open @ PF | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 104.99 | ht |
| N-2 (STR): Beacon - Boulder 230 kV & Beacon - Kootenai 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 104.94 | ht |
| N-1: Boulder - Irvin #2 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 104.82 | hs |
| BF: A324 Post Falls 115 kV, Otis Orchards-Post Falls | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 104.74 | ht |
| BF: A642 Otis Orchards 115 kV, Otis Orchards-Post Falls | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 104.71 | ht |
| BF: A370 Bell S1 & S2 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 104.58 | ht |
| N-1: Otis Orchards - Post Falls 115 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 104.51 | ht |
| N-2: Beacon - Boulder 230 kV & Beacon - Irvin #1 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 104.44 | ht |
| BF: R400 Kootenai-Rathdrum, Rathdrum #2 230/115 Transformer | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 104.43 | ht |
| N-1: Opportunity - Otis Orchards 115 kV Open @ OPT | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 104.38 | ht |
| BF: A1184 Lancaster-Noxon, Lancaster-Rathdrum | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 104.27 | ht |
| N-2 (ADJ): Bell - Taft 500 kV and Bell - Lancaster 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 104.17 | ht |
| BUS: Otis Orchards 115 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 103.91 | ht |
| BF: R408 Lancaster-Rathdrum, Rathdrum #2 230/115 Transformer | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 103.84 | ht |
| N-1: Otis Orchards - Post Falls 115 kV Open @ OTI | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 103.73 | ht |
| BF: A1558 Bell-Lancaster, Lancaster-Rathdrum | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 103.71 | ht |
| BF: A645 Otis Orchards 115 kV, Boulder-Otis Orchards | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 103.67 | ht |
| BUS: Bell S2 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 103.53 | ht |
| N-2 (STR): Boulder - Boulder Park 115 kV & Boulder - Rathdrum 115 kV (8) | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 103.48 | ht |
| BF: R400 Kootenai-Rathdrum, Rathdrum #2 230/115 Transformer | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 103.45 | ht |
| BF: A668 Ramsey 115 kV, Ramsey-Rathdrum #1 | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 103.14 | hs |
| BF: A641 Otis Orchards 115 kV, Opportunity-Otis Orchards | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 103.14 | ht |
| BF: R500 Kootenai-Rathdrum, Rathdrum #1 230/115 Transformer | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 103.09 | ht |
| BF: A645 Otis Orchards 115 kV, Boulder-Otis Orchards | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 103.04 | ht |
| PSF: Otis Orchards 115 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 103.04 | ht |
| BF: 4122 Bell-Taft, Hot Springs-Taft | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.97 | ht |
| BF: A642 Otis Orchards 115 kV, Otis Orchards-Post Falls | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.88 | hs |
| BF: R452 Beacon-Boulder, Boulder #2 230/115 Transformer | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.76 | ht |
| N-1: Boulder - Rathdrum 115 kV Open @ RAT | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 102.7 | ht |
| N-1: Bell - Usk 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.69 | ht |
| BF: R554 Boulder-Lancaster, Boulder #1 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 102.68 | hs |
| BF: R454 Boulder-Lancaster, Boulder #2 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 102.65 | hs |
| BF: R500 Kootenai-Rathdrum, Rathdrum #1 230/115 Transformer | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 102.49 | ht |
| BF: A374 Bell S1 230 kV, Bell-Boundary #1 | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.44 | ht |
| BF: R427 Beacon North & South 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.41 | hs |
| BUS: Bell S1 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.41 | ht |
| N-1: 3TM Bell - Boundary #1 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.41 | ht |
| BUS: Otis Orchards 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.4 | hs |

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| BF: A642 Otis Orchards 115 kV, Otis Orchards-Post Falls | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.35 | ht |
| BF: R427 Beacon North & South 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 102.28 | ht |
| BF: R508 Lancaster-Rathdrum, Rathdrum #1 230/115 Transformer | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 102.24 | ht |
| N-2 (ADJ): Beacon - Bell #4 230kV and Beacon - Kootenai 230kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.23 | ht |
| N-1: Beacon - Kootenai 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.22 | ht |
| BF: 4148 Garrison-Taft #2, Hot Springs-Taft | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.19 | ht |
| N-1: Kootenai - Rathdrum 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.19 | ht |
| BF: 4122 Bell-Taft, Hot Springs-Taft | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.19 | ht |
| BF: A1186 Lancaster-Noxon, Boulder-Lancaster | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.14 | hs |
| BF: A667 Ramsey 115 kV, Appleyway-Ramsey | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 102.07 | hs |
| BUS: Otis Orchards 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 102.07 | ht |
| N-2 (STR): Bell - Coulee #3 230 kV & Bell - Westside 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.97 | ht |
| N-2 (STR): Beacon - Boulder 230 kV & Beacon - Kootenai 230 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 101.95 | ht |
| BF: R552 Beacon-Boulder, Boulder #1 230/115 Transformer | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.9 | ht |
| N-1: Ramsey - Rathdrum #1 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.9 | ht |
| BF: A958 Bell-Usk, Usk 230/115 kV Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.89 | ht |
| BUS: Beacon North 230 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.86 | hs |
| BF: A953 Boundery-Usk, Usk 230/115 kV Transformer | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.84 | ht |
| N-1: Boulder #1 230/115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.83 | ht |
| BF: A642 Otis Orchards 115 kV, Otis Orchards-Post Falls | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 101.7 | ht |
| N-1: Bell - Westside 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.62 | ht |
| N-1: Ramsey - Rathdrum #1 115 kV Open @ RAT | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.55 | ht |
| PSF: Otis Orchards 115 kV | BOULDERW (48520) -> SPKINDPK (48405) CKT 1 at BOULDERW | 101.54 | ht |
| N-1: Boulder - Lancaster 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 101.52 | hs |
| N-1: Boulder - Rathdrum 115 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 101.41 | ht |
| N-2 (ADJ): Bell - Boundary #1 230 kV and Bell - Boundary #3 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.34 | ht |
| N-1: Benewah - Pine Creek 230 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 101.32 | ht |
| BUS: Ramsey 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.28 | hs |
| N-1: Coeur d'Alene 15th St - Rathdrum 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.22 | ht |
| N-1: Ramsey - Rathdrum #1 115 kV Open @ RAM | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 101.17 | ht |
| N-1: Rathdrum #2 230/115 kV | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 101.1 | ht |
| BF: A717 Boulder East & West 115 kV | RAMSEY (48349) -> PRAIRIEB (40855) CKT 1 at RAMSEY | 101.01 | hs |
| N-1: Boulder #2 230/115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.94 | ht |
| BF: R474 Benewah-Pine Creek, Benewah 230/115 Transformer | PLEASANT (48319) -> MOAB (47511) CKT 1 at PLEASANT | 100.92 | ht |
| BUS: Otis Orchards 115 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 100.9 | ht |
| N-1: Hot Springs - Noxon #1 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.87 | ht |
| BF: B1145 Addy 115 kV, Addy-Kettle Falls | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.86 | ht |
| N-1: Hot Springs - Noxon #2 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.84 | ht |
| N-1: Hot Springs - Noxon #1 230 kV Open @ HOTS | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.82 | ht |
| N-1: Appleyway - Rathdrum 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.79 | ht |
| N-2 (STR): Appleyway - Ramsey 115kV and Coeur d'Alene - Ramsey 115kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.79 | ht |
| N-1: Hot Springs - Noxon #1 230 kV Open @ NOX | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.78 | ht |
| N-2 (STR): Bell - Boundary #3 230 kV & Addy - Bell 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.77 | ht |
| BF: A1558 Bell-Lancaster, Lancaster-Rathdrum | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 100.74 | ht |
| N-1: 3TM Bell - Boundary #3 230 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.59 | ht |
| BUS: Addy 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.58 | ht |
| N-1: Benewah - Pine Creek 230 kV | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 100.55 | ht |
| BF: A688 Ninth & Central North & South 115 kV | ROSSPARK (48371) -> THIRHACH (48431) CKT 1 at ROSSPARK | 100.55 | hs |
| N-1: Albeni Falls - Sacheen 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.5 | ht |
| N-1: 3TM Bell - Boundary #3 230 kV Open @ BOUN | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.5 | ht |
| BF: B323 Sacheen 115 kV, Albeni Falls-Sacheen | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.49 | ht |
| N-1: Albeni Falls - Sacheen 115 kV Open @ ALB | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.49 | ht |
| BF: A521 Devils Gap East 115 kV, Addy-Devils Gap | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.46 | ht |
| BF: A540 Devil's Gap East & West 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.46 | ht |
| BUS: Devils Gap East 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.46 | ht |
| BF: A506 Rathdrum 115 kV, Pine Street-Rathdrum | HUETTER (48159) -> HERN (48155) CKT 1 at HERN | 100.44 | hs |
| N-1: Appleyway - Rathdrum 115 kV Open @ RAT | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.42 | ht |
| BF: B1137 Addy 115 kV, Addy-Devils Gap | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.34 | ht |
| BUS: Rathdrum East 115 kV | HUETTER (48159) -> HERN (48155) CKT 1 at HERN | 100.29 | hs |
| BF: A526 Devils Gap East 115 kV, Airway Heights-Devils Gap | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.26 | ht |
| PSF: Devils Gap East 115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.26 | ht |
| BF: A1186 Lancaster-Noxon, Boulder-Lancaster | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 100.25 | ht |
| N-1: Sacheen 230/115 kV | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.22 | ht |
| BF: R474 Benewah-Pine Creek, Benewah 230/115 Transformer | PRAIRIEB (40855) -> POST FLS (48329) CKT 1 at PRAIRIEB | 100.17 | ht |
| N-1: Albeni Falls - Sacheen 115 kV Open @ SACH | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.17 | ht |
| N-1: Appleyway - Rathdrum 115 kV Open @ APW | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.14 | ht |
| BF: A641 Otis Orchards 115 kV, Opportunity-Otis Orchards | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 100.14 | ht |
| BF: B1135 Addy 115 kV, Addy-Bell | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.07 | ht |



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| N-1: Post Falls - Ramsey 115 kV Open @ RAM | IDAHO_RD (48161) -> PLEASANT (48319) CKT 1 at IDAHO_RD | 100.05 | hs |
| BF: A645 Otis Orchards 115 kV, Boulder-Otis Orchards | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 100.04 | ht |
| PSF: Otis Orchards 115 kV | MOAB (47511) -> BOULDERE (48522) CKT 1 at MOAB | 100.04 | ht |