Docket No. 21-035-09

UAE Exhibit 2

Generation Interconnection Cluster 1 Study Report Cluster Area 1 (November 10, 2021)

Generation Interconnection

Cluster 1 Study Report

Cluster Area 1

November 10, 2021

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1.0 SCOPE OF THE STUDY

Cluster Area 1 (CA1) is generally described as the eastern Wyoming area and includes the following Interconnection Requests: C1-02, C1-03, C1-25, C1-35, C1-48, C1-53, C1-55, C1-57 and C1-59.

Consistent with Attachment W, Section 3.4.2 and Section 51.4 of PacifiCorp's ("Transmission Provider") Open Access Transmission Tariff ("OATT"), this interconnection Transition Cluster Study ("Cluster Study") evaluated the impact of the proposed interconnections on the reliability of the Transmission System. The Cluster Study considered the Base Case as well as all generating facilities (and with respect to (iii) below, any identified Network Upgrades associated with such higher queued interconnection) that, on the date the Cluster Request Window closes:

(i) are existing and directly interconnected to the Transmission System;
(ii) are existing and interconnected to Affected Systems and may have an impact on the Interconnection Request;
(iii) have a pending higher queued or higher clustered interconnection request to interconnect to the transmission system; and
(iv) have executed an LGIA or requested that an unexecuted LGIA be filed with FERC.

The Cluster Study consisted of power flow, stability, and short circuit analyses.

This Cluster Study report provides the following information:

- identification of any circuit breaker short circuit capability limits exceeded as a result of the interconnection;
- identification of any thermal overload or voltage limit violations resulting from the interconnection;
- identification of any instability or inadequately damped response to system disturbances resulting from the interconnection and
- description and non-binding, good faith estimated cost of facilities required to interconnect the Generating Facilities to the Transmission System and to address the identified short circuit, instability, and power flow issues.

2.0 STUDY ASSUMPTIONS

- All active higher priority transmission service and/or generator interconnection requests that were considered in this study are listed in Appendix 2. If any of these requests are withdrawn, the Transmission Provider reserves the right to restudy this request, and the results and conclusions could significantly change.
- For study purposes there are two separate queues:
  - o Transmission Service Queue: to the extent practical, all network upgrades that are required to accommodate active transmission service requests were modeled in this study.
  - o Generation Interconnection Queue: Interconnection Facilities and network upgrades associated with higher queued or higher clustered interconnection requests were modeled in this study.
- The Interconnection Customers' request for energy or network resource interconnection service in and of itself does not request or convey transmission service. Only a Network Customer may make a request to designate a generating resource as a Network Resource. Because the queue of higher priority transmission service requests may be different when a Network Customer requests network resource designation for this Generating Facility, the available capacity or transmission modifications, if any, necessary to provide Network Integration Transmission Service may be significantly different. Therefore, Interconnection

Customers should regard the results of this study as informational rather than final.

- Under normal conditions, the Transmission Provider does not dispatch or otherwise directly control or regulate the output of generating facilities. Therefore, the need for transmission modifications, if any, that may be required to provide Network Resource Interconnection Service will be evaluated on the basis of 100 percent deliverability (i.e., this study did not model displacement of other resources in the same area).
- This study assumed the Projects will be integrated into the Transmission Provider's system at agreed upon and/or proposed Points of Interconnection ("POI" or "POIs").
- If Interconnection Customers proceed through the interconnection process, they will be required to construct and own any facilities required between the Point of Change of Ownership and the Project unless specifically identified by the Transmission Provider.
- Line reconductor or fiber underbuild required on existing poles were assumed to follow the most direct path on the Transmission Provider's system. If during detailed design the path must be modified it may result in additional cost and timing delays for the Interconnection Customer's Project.
- Generator tripping may be required for certain outages.
- All facilities will meet or exceed the minimum Western Electricity Coordinating Council ("WECC"), North American Electric Reliability Corporation ("NERC"), and the Transmission Provider's performance and design standards.
- Power flow analysis requires WECC base cases to reliably balance under peak load conditions the aggregate of generation in the local area, with the Generating Facility at full output, to the aggregate of the load in the Transmission Provider's Transmission System. As the ("PACE") balancing authority area ("BAA") has more existing and proposed generation than load, it is necessary to assume some portion of other resources are displaced by this Project's output in order to assess the impact of interconnecting this Project's generation to transmission system operations. For the purposes of this study, generation in the Transmission Provider's southern Utah area was assumed to be displaced.
- The following transmission improvements were assumed in-service:
  - Transmission Provider's planned projects:
    - Energy Gateway South (Aeolus-Clover) 500 kV transmission line project. (Q4 2024).
    - A Transmission Provider planned upgrade of the existing Jim Bridger 345/230 kV #2 transformer to 700 MVA (Q4 2021)
    - Transmission Provider planned Gateway West Segment D3 (Anticline/ Populus) 500 kV line and all associated upgrades required for the project. (Q4 2027)
  - Upgrades assigned to higher priority Interconnection Request Q0835:
    - A new 230 kV transmission line between Aeolus and Freezeout substations (Q4 2024)
- All existing and proposed RAS are assumed to be in service for this study.
- The Transmission Provider assumes it will be required to meter DC coupled solar and battery storage separately. This may result in a significant amount of Interconnection Facilities for Interconnection Customer's proposing this type of design. It may also result in significant, annual maintenance costs for Interconnection Customers. Please note that the Transmission Provider does not currently have an approved meter capable of this function therefore cost estimates and schedules are preliminary at this time. The Transmission Provider assumes it will not be able to support a Commercial Operation Date for any Interconnection Request with DC coupled battery storage prior to Q4 2024.
- This report is based on information available at the time of the study. It is the Interconnection Customer's responsibility to check the Transmission Provider's web site regularly for Transmission System updates at https://www.oasis.oati.com/ppw

3.0 GENERATING FACILITY REQUIREMENTS

The following requirements are applicable to all Interconnection Requests. The Transmission Provider will identify any site-specific generating facility requirements in addition to the following in this report and in facilities studies. Certain Interconnection Requests requesting service at a voltage level traditionally defined as distribution may be subject to the transmission interconnection request requirements listed below should the Transmission Provider make that determination.

3.1 Transmission Voltage Interconnection Requests

All interconnecting synchronous and non-synchronous generators are required to design their Generating Facilities with reactive power capabilities necessary to operate within the full power factor range of 0.95 leading to 0.95 lagging. This power factor range shall be dynamic and can be met using a combination of the inherent dynamic reactive power capability of the generator or inverter, dynamic reactive power devices and static reactive power devices to make up for losses.

For synchronous generators, the power factor requirement is to be measured at the POI. For non-synchronous generators, the power factor requirement is to be measured at the high-side of the generator substation.

The Generating Facility must provide dynamic reactive power to the system in support of both voltage scheduling and contingency events that require transient voltage support, and must be able to provide reactive capability over the full range of real power output.

If the Generating Facility is not capable of providing positive reactive support (i.e., supplying reactive power to the system) immediately following the removal of a fault or other transient low voltage perturbations, the facility must be required to add dynamic voltage support equipment. These additional dynamic reactive devices shall have correct protection settings such that the devices will remain on line and active during and immediately following a fault event.

Generators shall be equipped with automatic voltage-control equipment and normally operated with the voltage regulation control mode enabled unless written authorization (or directive) from the Transmission Provider is given to operate in another control mode (e.g. constant power factor control). The control mode of generating units shall be accurately represented in operating studies. The generators shall be capable of operating continuously at their maximum power output at its rated field current within +/- 5% of its rated terminal voltage.

All generators are required to ensure the primary frequency capability of their Facility by installing, maintaining, and operating a functioning governor or equivalent controls as indicated in FERC Order 842.

As required by NERC standard VAR-001-4.2, the Transmission Provider will provide a voltage schedule for the POI. In general, Generating Facilities should be operated so as to maintain the voltage at the POI, typically between 1.00 per unit to 1.04 per unit, or other designated point as deemed appropriated by Transmission Provider. The Transmission Provider may also specify a voltage and/or reactive power bandwidth as needed to coordinate with upstream voltage control devices such as on-load tap changers. At the Transmission Provider's discretion, these values might be adjusted depending on operating conditions.

Generating Facilities capable of operating with a voltage droop are required to do so. Voltage droop control enables proportionate reactive power sharing among Generation Facilities. Studies will be required to coordinate voltage droop settings if there are other facilities in the area. It will be the Interconnection Customer's responsibility to ensure that a voltage coordination study is performed, in coordination with Transmission Provider, and implemented with appropriate coordination settings prior to unit testing.

For areas with multiple generating facilities additional studies may be required to determine whether or not critical interactions, including but not limited to control systems, exist. These studies, to be coordinated with Transmission Provider, will be the responsibility of the Interconnection Customer. If the need for a master controller is identified, the cost and all related installation requirements will be the responsibility of the Interconnection Customer. Participation by the Generation Facility in subsequent interaction/coordination studies will be required pre- and post-commercial operation in order ensure system reliability.

Interconnection Requests that are 75 MVA or larger may be required to facilitate collection and validation of accurate modeling data to meet NERC modeling standards. The Transmission Provider, in its roles as the Planning Coordinator, requires Phasor Measurement Units (PMUs) at all new Generating Facilities with an individual or aggregate nameplate capacity of 75 MVA or greater. In addition to owning and maintaining the PMU, the Generating Facility will be responsible for collecting, storing (for a minimum of 90 days) and retrieving data as requested by the Planning Coordinator. Data must be stored for a minimum of 90 days. Data must be collected and be able to stream to Planning Coordinator for each of the Generating Facility's step-up transformers measured on the low side of the GSU at a sample rate of at least 60 samples per second and synchronized within +/- 2 milliseconds of the Coordinated Universal Time (UTC). Initially, the following data must be collected:

- Three phase voltage and voltage angle (analog)
- Three phase current (analog)

Data requirements are subject to change as deemed necessary to comply with local and federal regulations.

All generators must meet the Federal Energy Regulatory Commission (FERC), North American Electric Reliability Corporation (NERC) and WECC low voltage ride-through requirements as specified in the interconnection agreement. Inverters must be designed to stay connected to the grid in the case of severe faults and may not momentarily cease output within the no-trip area of the voltage curves. Figure 1 illustrates the voltage ride-through capability as per NERC PRC-024. Importantly, inverters should be designed such that a trip outside of the curves is a "may-trip" area (if needed to protect equipment) not a "must-trip" area. Inverters that momentarily cease active power output for these voltage excursions should be configured to restore output to pre-disturbance levels in no greater than five seconds, provided the inverter is capable of these changes. Generators must provide test results to the Transmission Provider verifying that the inverters for this Project have been programmed to meet all PRC-024 requirements rather than manufacturer IEEE distribution standards.

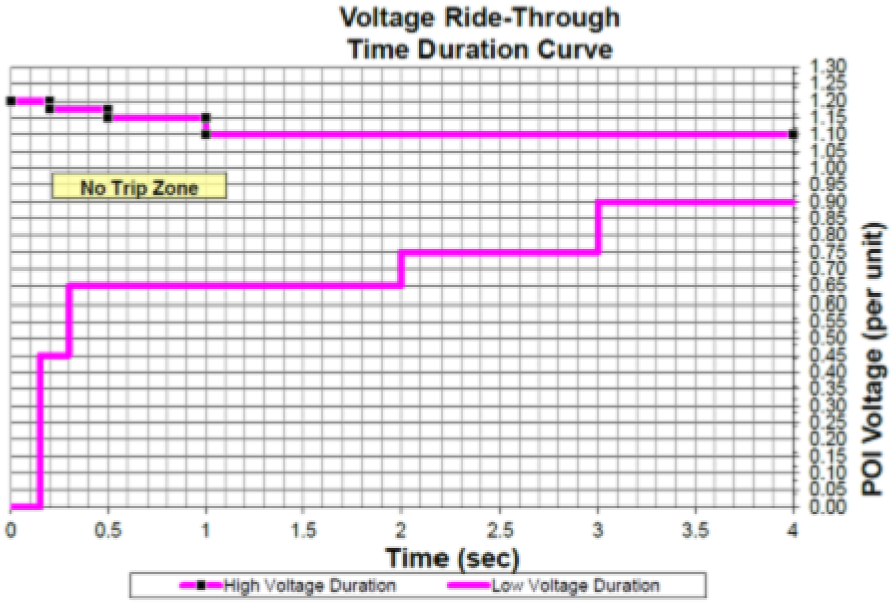


Figure 1 – Voltage Ride-Through Curve

As the Transmission Provider cannot submit a user written model to WECC for inclusion in base cases, a standard model from the WECC Approved Dynamic Model Library is required 180 days prior to trial operation. The list of approved generator models is continually updated and is available on the http://www.WECC.biz website.

Interconnection Customer with an Interconnection Request for a Generating Facility that is both 75 MVA or larger as well as being interconnected at a voltage higher than 100 kV shall register with NERC as the Generator Owner ("GO") and Generator Operator ("GOP") for the Large Generating Facility and provide the Transmission Provider documentation demonstrating registration in order to be approved for Commercial Operation. This registration must be maintained throughout the lifetime of the Interconnection Agreement.

Interconnection Customers are responsible for the protection of transmission lines between the Generating Facility and the POI substation. For Interconnection Requests that are smaller than 75 MVA or are interconnected at a voltage less than 100 kV which have a tie line that is longer than 1,000 feet the Interconnection Customer shall construct and own a tie-line substation to be located at the change of ownership (separate fenced facility adjacent to the Transmission Provider's POI substation). The tie line substation shall include an Interconnection Customer owned protective device and associated transmission line relaying/communications. The ground grids of the Transmission Provider's POI substation and the Interconnection Customer's tie-line substation will be connected to support the use of a bus differential protection scheme which will protect the overhead bus connection between the two facilities.

3.2 Distribution Voltage Interconnection Requests

The Generating Facility and interconnection equipment owned by the Interconnection Customers are required to operate under constant power factor mode with a unity power factor setting unless specifically requested otherwise by the Transmission Provider. The Generating Facilities are expressly forbidden from actively participating in voltage regulation of the Transmission Provider's system without written request or authorization from the Transmission Provider. The Generating Facilities shall have sufficient reactive capacity to enable the delivery of 100 percent of the plant output to the applicable POI at unity power factor measured at 1.0 per unit voltage under steady state conditions.

Generators capable of operating under voltage control with voltage droop are required to do so. Studies will be required to coordinate the voltage droop setting with other facilities in the area. In general, the Generating Facility and Interconnection Equipment should be operated so as to maintain the voltage at the POI between 1.01 pu to 1.04 pu. At the Transmission Provider's discretion, these values might be adjusted depending on the operating conditions. Within this voltage range, the Generating Facility should operate so as to minimize the reactive interchange between the Generating Facility and the Transmission Provider's system (delivery of power at the POI at approximately unity power factor). The voltage control settings of the Generating Facility must be coordinated with the Transmission Provider prior to energization (or interconnection). The reactive compensation must be designed such that the discreet switching of the reactive device (if required by the Interconnection Customer) does not cause step voltage changes greater than +/-3% on the Transmission Provider's system.

All generators must meet applicable WECC low voltage ride-through requirements as specified in the interconnection agreement.

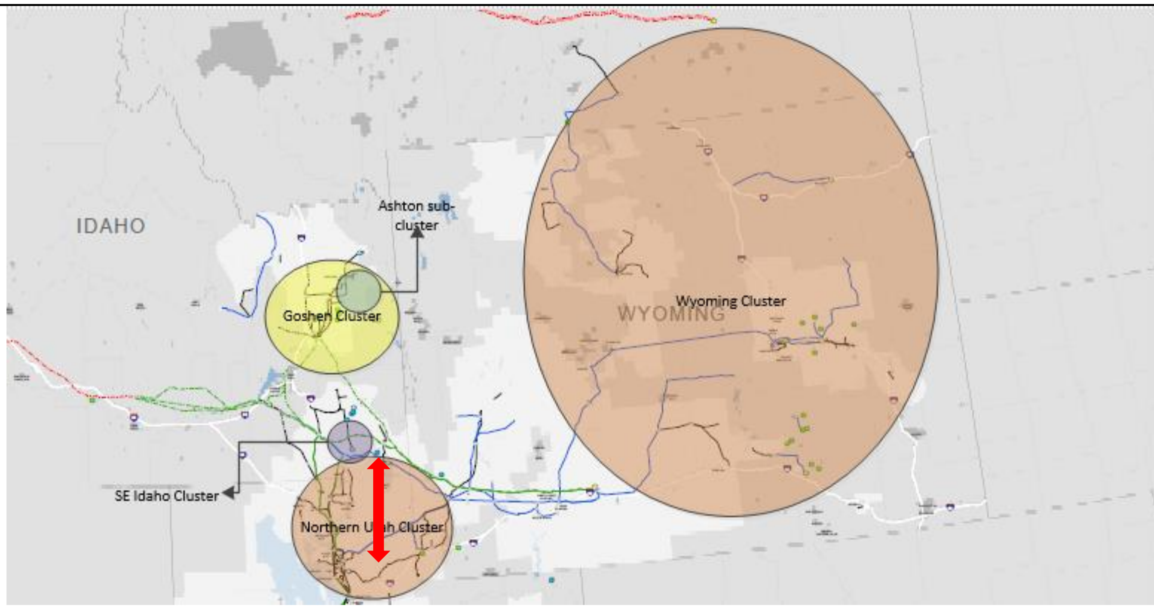
As per NERC standard VAR-001-1, the Transmission Provider is required to specify voltage or reactive power schedule at the POI. Under normal conditions, the Transmission Provider's system should not supply reactive power to the Generating Facility.

4.0 CLUSTER AREA DEFINITIONS

The Transmission Provider performed the Transition Cluster Study based on geographically and/or electrically relevant areas on the Transmission Provider's Transmission System known as Cluster Areas. The Transmission Provider has determined that the Interconnection Requests discussed in Section 5.0 are located in a geographically and/or electrically relevant area on Transmission Provider's Transmission System, and thus, were assigned Cluster Area 1 in the Transition Cluster Study process.

5.0 CLUSTER AREA 1

Cluster Area 1 (CA1) is generally described as Eastern Wyoming. The Cluster area includes all generation interconnection requests in the Wyoming area east of the Jim Bridger West Path and also east of the Rock Springs – Firehole West cutplane which is shown with the red arrow in the diagram below. The Jim Bridger West path provides a transmission path to the west into southeast Idaho and the Rock Springs – Firehole West cutplane traverses through southwest Wyoming providing a transmission path into northern Utah. The diagram below provides a high-level description of the Wyoming cluster area.



This Cluster Area consists of the following Interconnection Requests.

5.1 Description of Interconnection Request – C1-02

The Interconnection Customer has proposed to interconnect 20 megawatts ("MW") of new solar generation to PacifiCorp's ("Transmission Provider") 34.5 kV circuit 9H182 out of Frannie substation located in Park County, Wyoming. The Interconnection Request is proposed to consist of six (6) 3550 kVA FS3430HEMK Power Electronics solar inverters for a total output of 20 MW at the POI. The requested commercial operation date is December 31, 2025. Figure 2 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

Interconnection Customer will operate this generator as a Qualified Facility as defined by the Transmission Provider Regulatory Policies Act of 1978 (PURPA).

The Interconnection Request will be studied for Network Resource Interconnection Service ("NRIS").

The Transmission Provider has assigned the Project Cluster Number "C1-02"

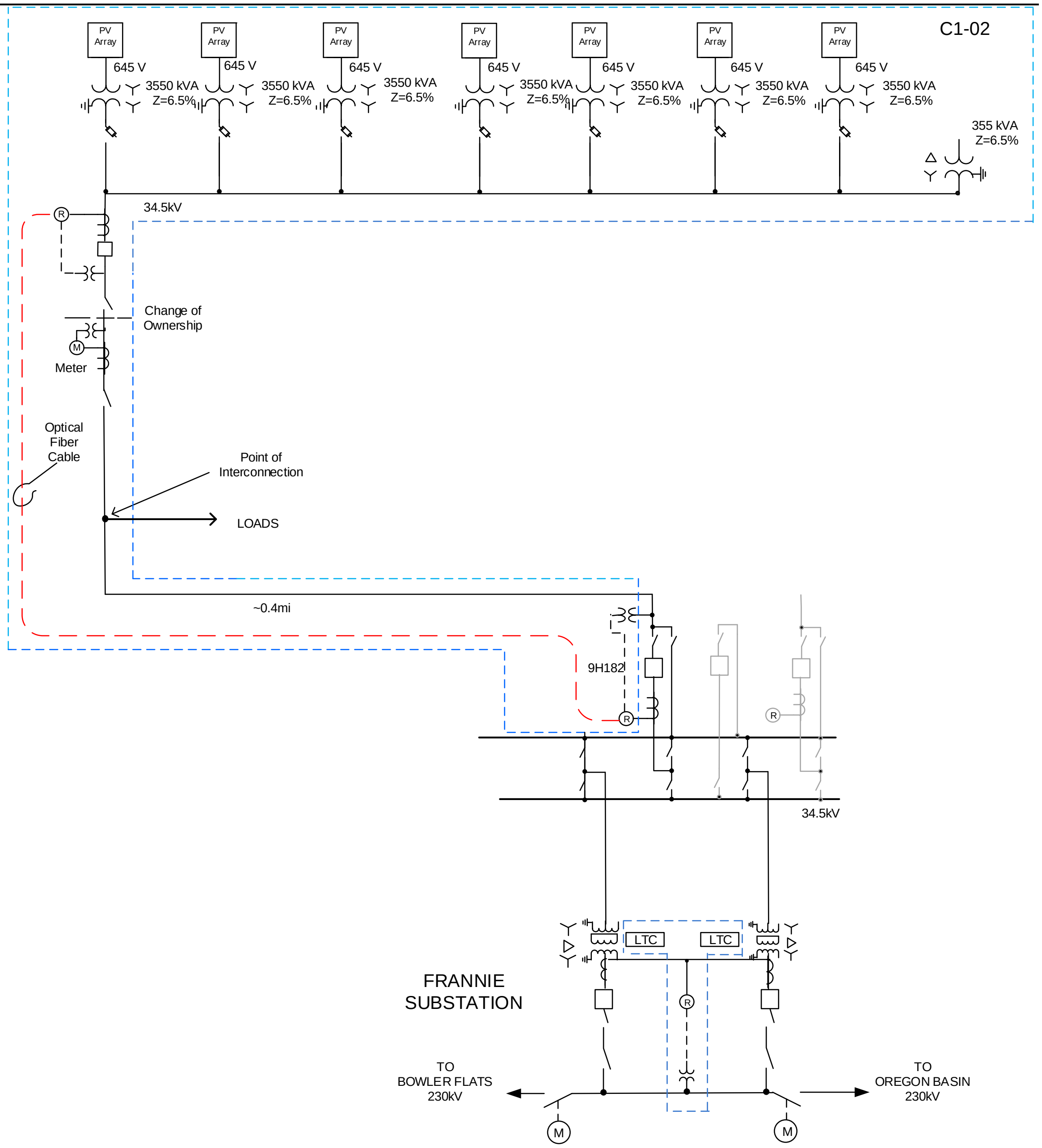


Figure 2: Simplified System One Line Diagram C1-02

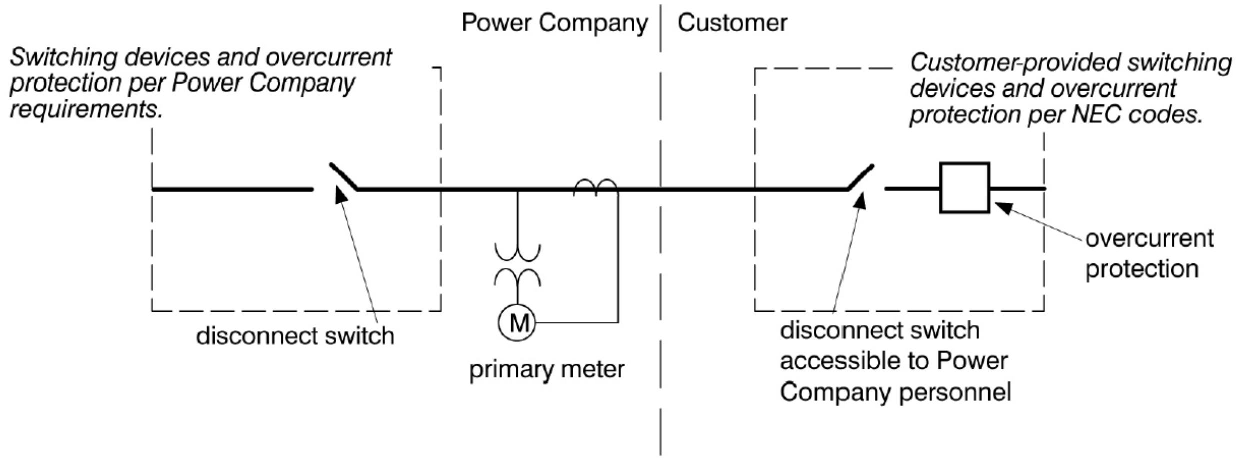


Figure 2a: Connection diagram C1-02

5.2 Description of Interconnection Request – C1-03

The Interconnection Customer has proposed to interconnect 9 megawatts ("MW") of new solar generation to PacifiCorp's ("Transmission Provider") 34.5 kV circuit 9H184 out of Frannie substation located in Park County, Wyoming. The Interconnection Request is proposed to consist of three (3) 3550 kVA FS3430HEMK Power Electronics solar inverters for a total output of 9 MW at the POI. The requested commercial operation date is December 31, 2025. Figure 3 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

Interconnection Customer will operate this generator as a Qualified Facility as defined by the Transmission Provider Regulatory Policies Act of 1978 (PURPA).

The Interconnection Request will be studied for Network Resource Interconnection Service ("NRIS").

The Transmission Provider has assigned the Project Cluster Number "C1-03"

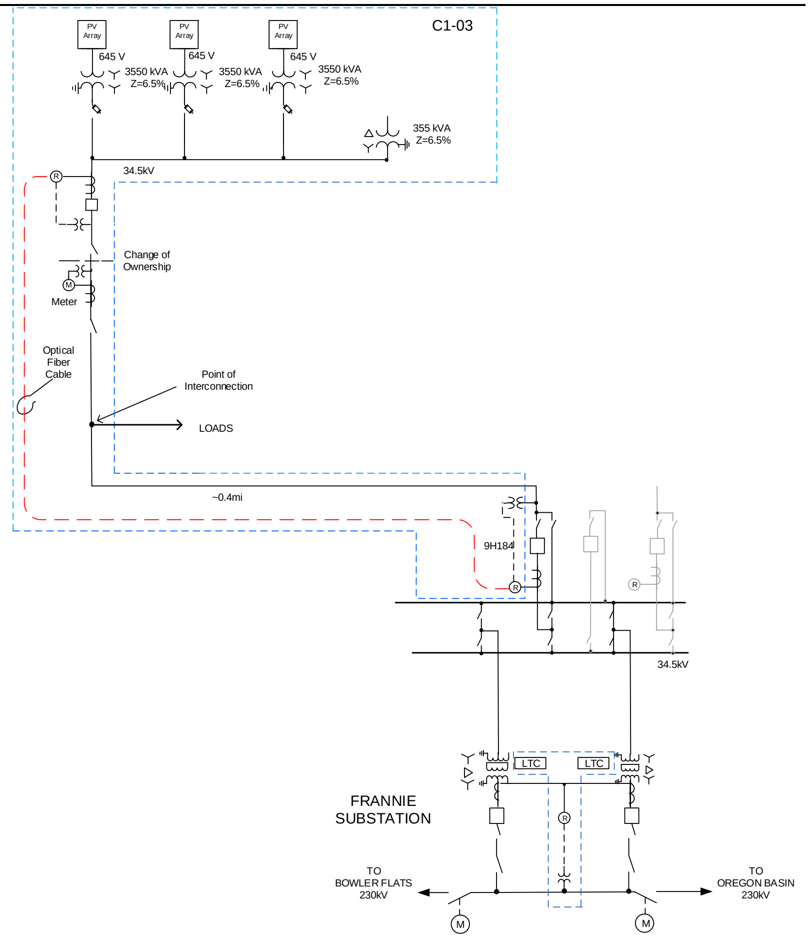


Figure 3: Simplified System One Line Diagram C1-03

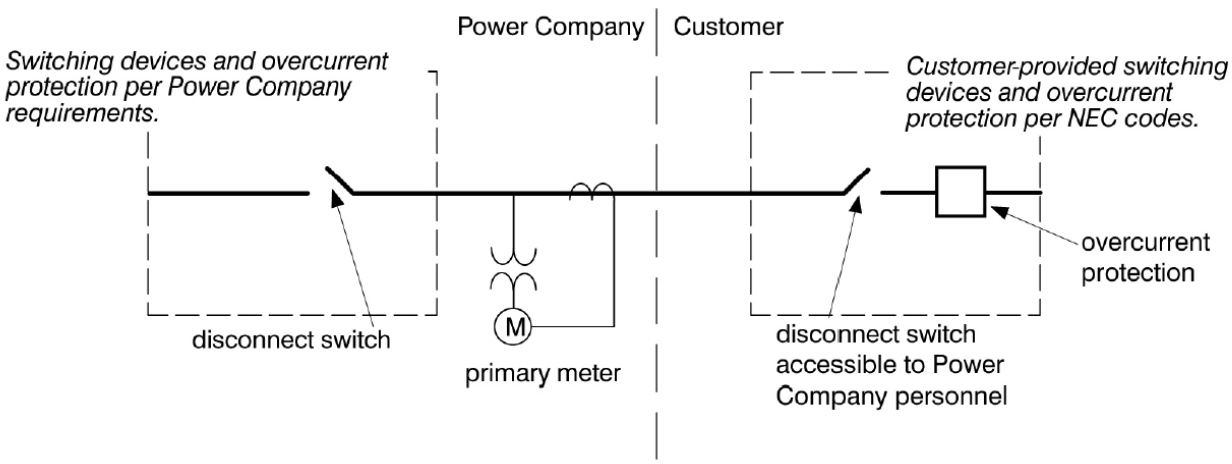


Figure 3a: Connection diagram C1-03

5.3 Description of Interconnection Request – C1-25

The Interconnection Customer has proposed to interconnect 900 megawatts ("MW") of new pump storage generation to PacifiCorp's ("Transmission Provider") 230 kV Aeolus substation located in Carbon County, Wyoming. The Interconnection Request is proposed to consist of three (3) 333.3 MVA hydro turbine generators for a total output of 900 MW at the POI. The requested commercial operation date is May 1, 2028. The Large Generating Facility is proposed to interconnect to Aeolus through two 28.9-mile long 230 kV lines in order to ensure that a single contingency does not result in loss of all 900 MW. Customer owned 230 kV substation is also designed as a breaker and half with eight breakers to alleviate the loss of all generators for a single contingency. Figure 4 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

Interconnection Customer will NOT operate this generator as a Qualified Facility as defined by the Transmission Provider Regulatory Policies Act of 1978 (PURPA).

The Interconnection Request will be studied for both Network Resource Interconnection Service ("NRIS") and Energy Resource Interconnection Service ("ERIS").

The Transmission Provider has assigned the Project Cluster Number "C1-25"

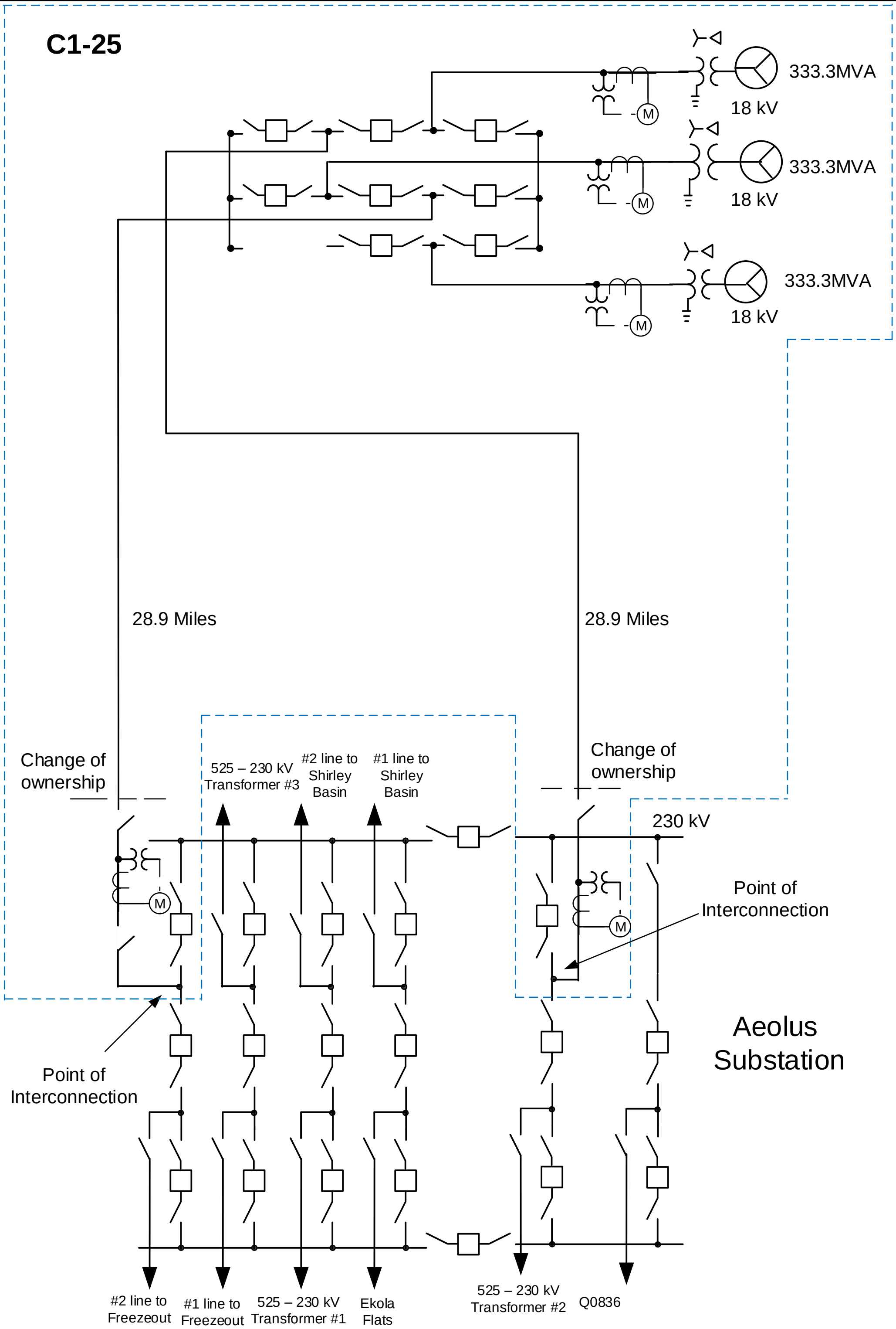


Figure 4: Simplified System One Line Diagram C1-25

5.4 Description of Interconnection Request – C1-35

The Interconnection Customer has proposed to interconnect 500 megawatts ("MW") of new wind generation to PacifiCorp's ("Transmission Provider") 230 kV Aeolus substation located in Carbon County, Wyoming.

The Interconnection Request is proposed to consist of one hundred (100) Siemens Gamesa SG5.0 wind turbine generators for a total output of 500 MW at the POI. The requested commercial operation date is December 31, 2024. The Large Generating Facility is proposed to interconnect to the Aeolus 230 kV substation through four 230/34.5 kV 160 MVA each auto transformers and a 25.5 mile long 230 kV transmission line. Figure 5 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

Interconnection Customer will NOT operate this generator as a Qualified Facility as defined by the Transmission Provider Regulatory Policies Act of 1978 (PURPA).

The Interconnection Request will be studied for Energy Resource Interconnection Service ("ERIS").

The Transmission Provider has assigned the Project Cluster Number "C1-35"

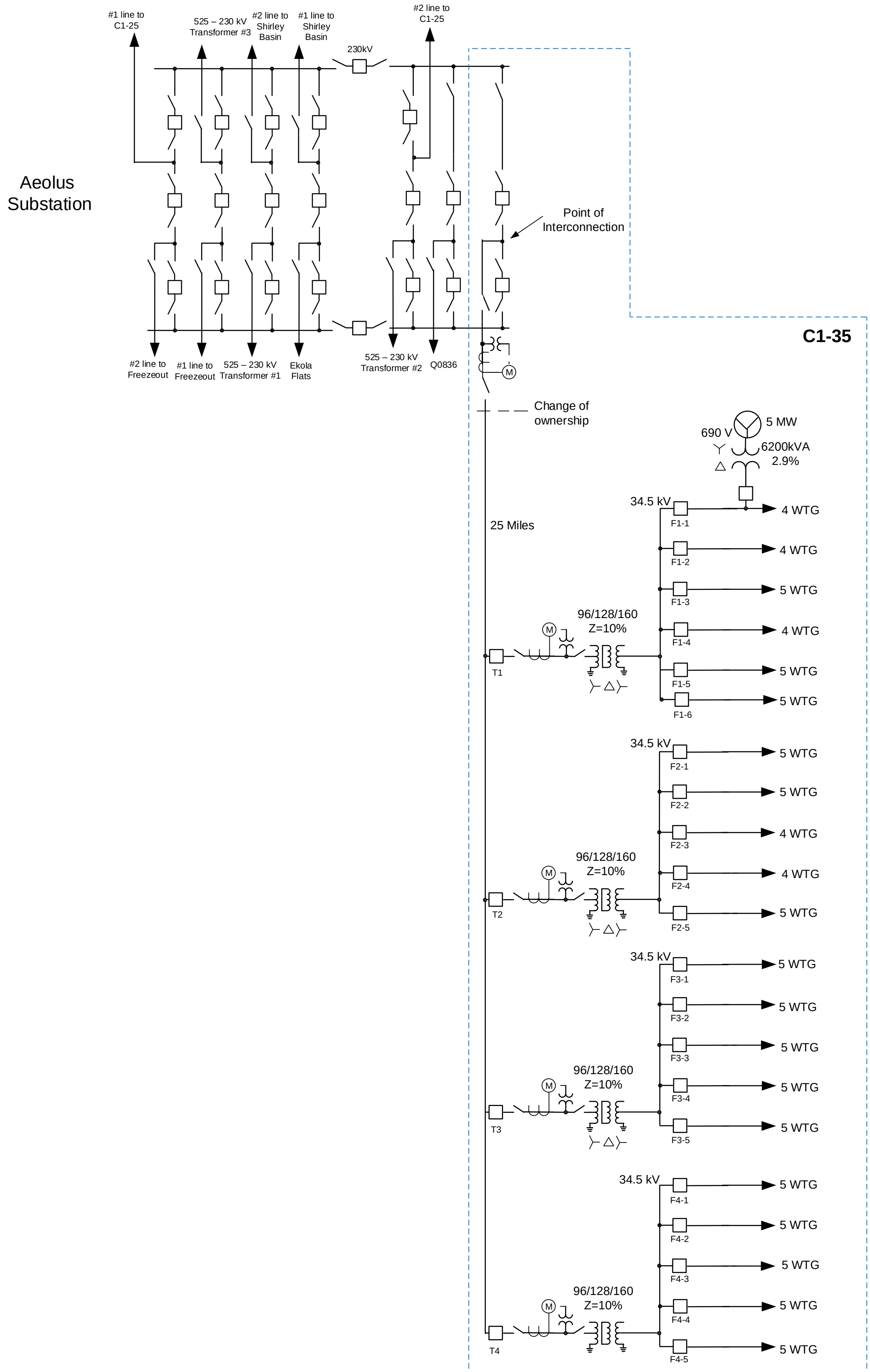


Figure 5: Simplified System One Line Diagram C1-35

5.5 Description of Interconnection Request – C1-48

The Interconnection Customer has proposed to interconnect 600 megawatts ("MW") of new wind generation to PacifiCorp's ("Transmission Provider") 230 kV Jim Bridger substation located in Sweetwater County, Wyoming. The Interconnection Request is proposed to consist of two hundred sixty-seven (267) 2.526 kVA GE wind turbine generators for a total output of 600 MW at the POI. The requested commercial operation date is December 1, 2025. The Large Generating Facility is proposed to interconnect to the Bridger 230 kV substation through four 230/34.5 kV 170 MVA each auto transformers and a 30 mile long 230 kV transmission line. Figure 6 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

Interconnection Customer will NOT operate this generator as a Qualified Facility as defined by the Transmission Provider Regulatory Policies Act of 1978 (PURPA).

The Interconnection Request will be studied for both Network Resource Interconnection Service ("NRIS") and Energy Resource Interconnection Service ("ERIS").

The Transmission Provider has assigned the Project Cluster Number "C1-48"

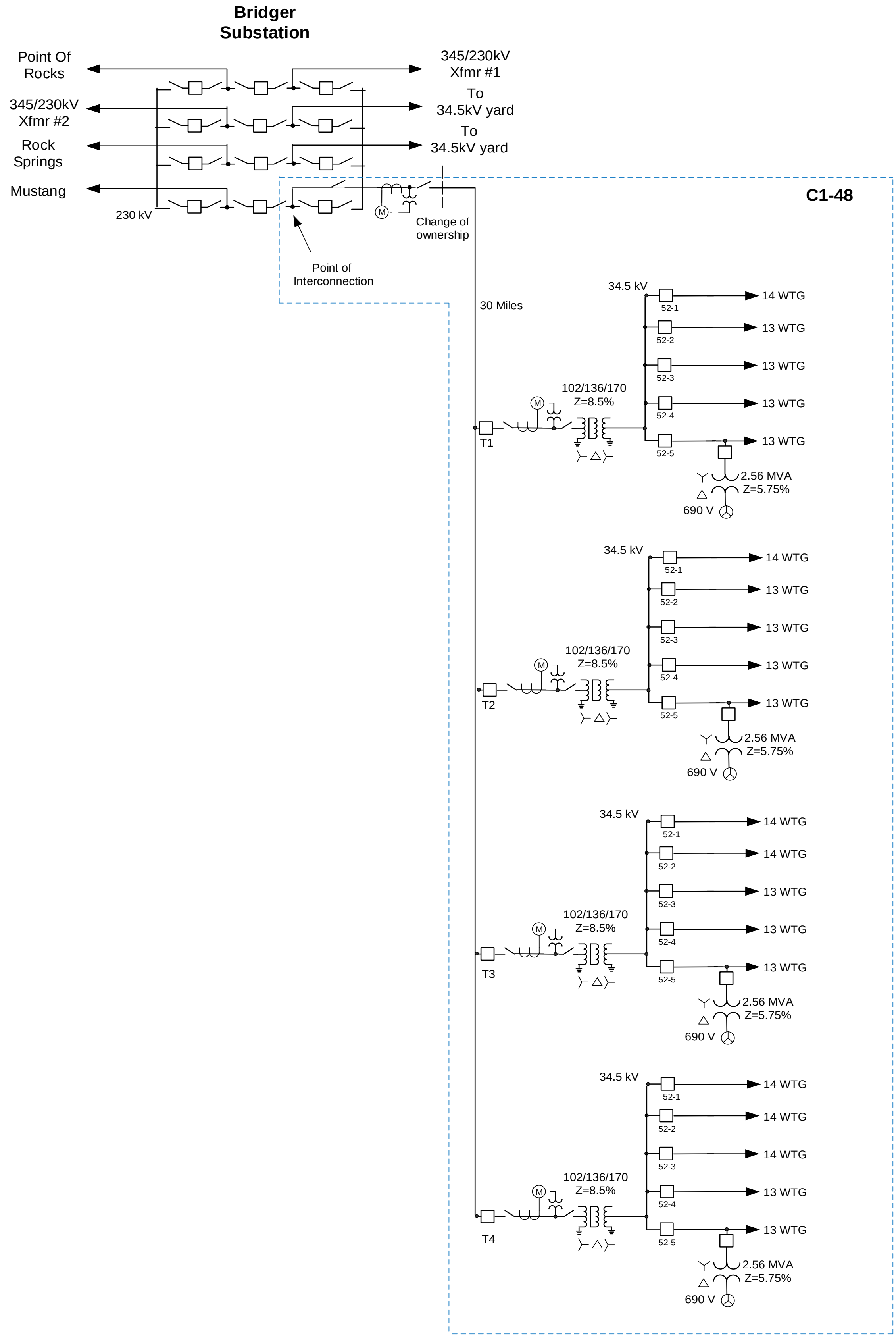


Figure 6: Simplified System One Line Diagram C1-48

5.6 Description of Interconnection Request – C1-53

The Interconnection Customer has proposed to interconnect 190 megawatts ("MW") of new wind generation to PacifiCorp's ("Transmission Provider") 230 kV Aeolus substation located in Carbon County, Wyoming. The Interconnection Request is proposed to consist of sixty-four (64) 3.367 kVA GE wind turbine generators for a total output of 190 MW at the POI. The requested commercial operation date is December 31, 2024. The Large Generating Facility is proposed to interconnect to the Aeolus 230 kV substation through two 230/34.5 kV 119 MVA each auto transformers and a 32 mile long 230 kV transmission line proposed to be constructed as part of higher priority Interconnection Request Q0836. Figure 7 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

Interconnection Customer will NOT operate this generator as a Qualified Facility as defined by the Transmission Provider Regulatory Policies Act of 1978 (PURPA).

The Interconnection Request will be studied for Energy Resource Interconnection Service ("ERIS").

The Transmission Provider has assigned the Project Cluster Number "C1-53"

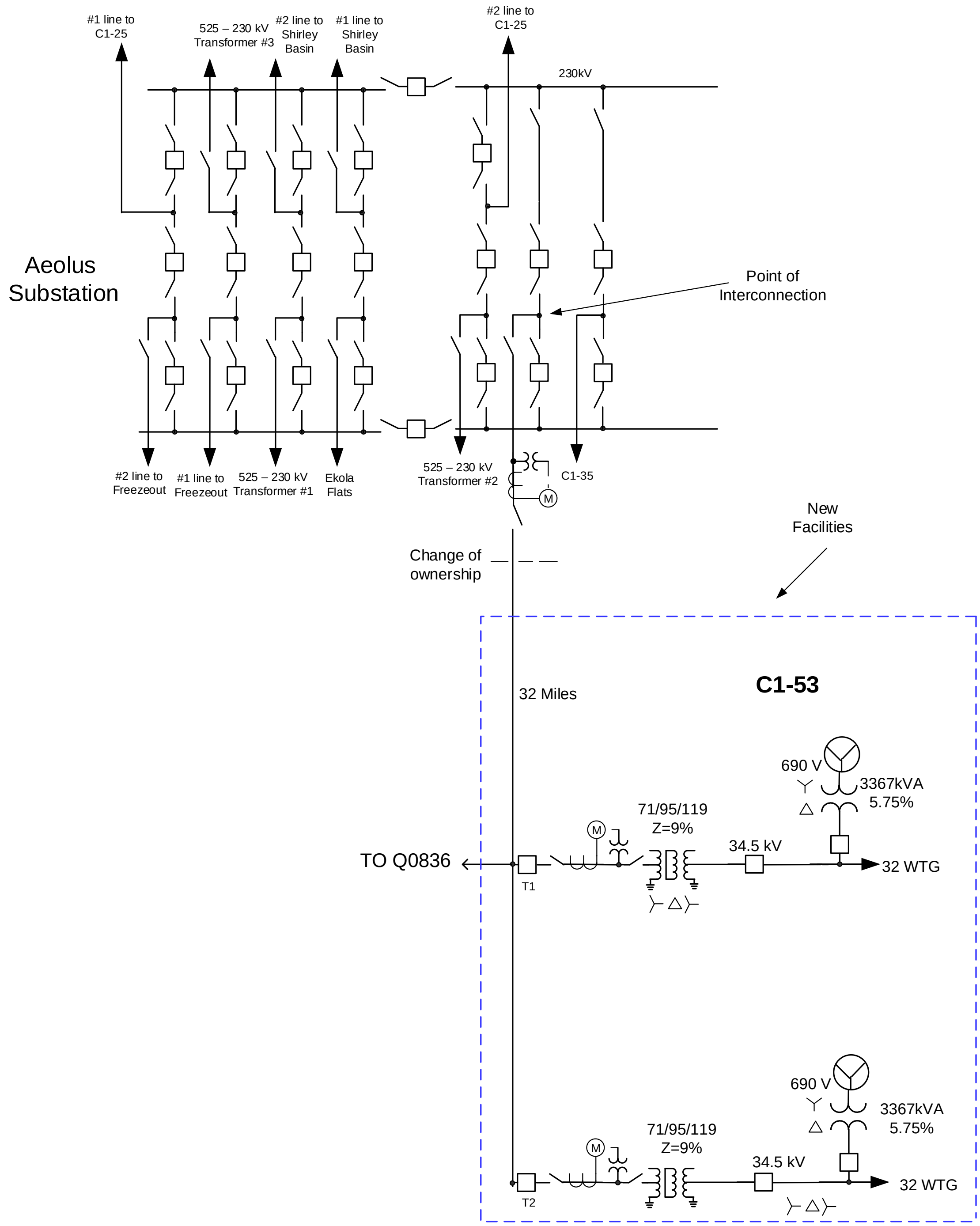


Figure 7: Simplified System One Line Diagram C1-53

5.7 Description of Interconnection Request – C1-55

The Interconnection Customer has proposed to interconnect 199 megawatts (“MW”) of new solar and battery storage generation to PacifiCorp’s (“Transmission Provider”) 230 kV Platte substation located in Carbon County, Wyoming. The Interconnection Request is proposed to consist of fifty-six (56) TMEIC PVU-L0840GR 4.20 MVA solar inverters for a total output of 199 MW at the POI. The Interconnection Request also consists of eighteen (18) TMEIC BSU-L0640GR 3.20 MVA BESS inverters. The requested commercial operation date is December 31, 2025. The Customer will be interconnecting to the Platte 230 kV substation through two 230/34.5 kV 125 MVA each auto transformers and one mile long 230 kV transmission line. Figure 8 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

Interconnection Customer will NOT operate this generator as a Qualified Facility as defined by the Transmission Provider Regulatory Policies Act of 1978 (PURPA).

The Interconnection Request will be studied for Energy Resource Interconnection Service ("ERIS").

The Transmission Provider has assigned the Project Cluster Number "C1-55"

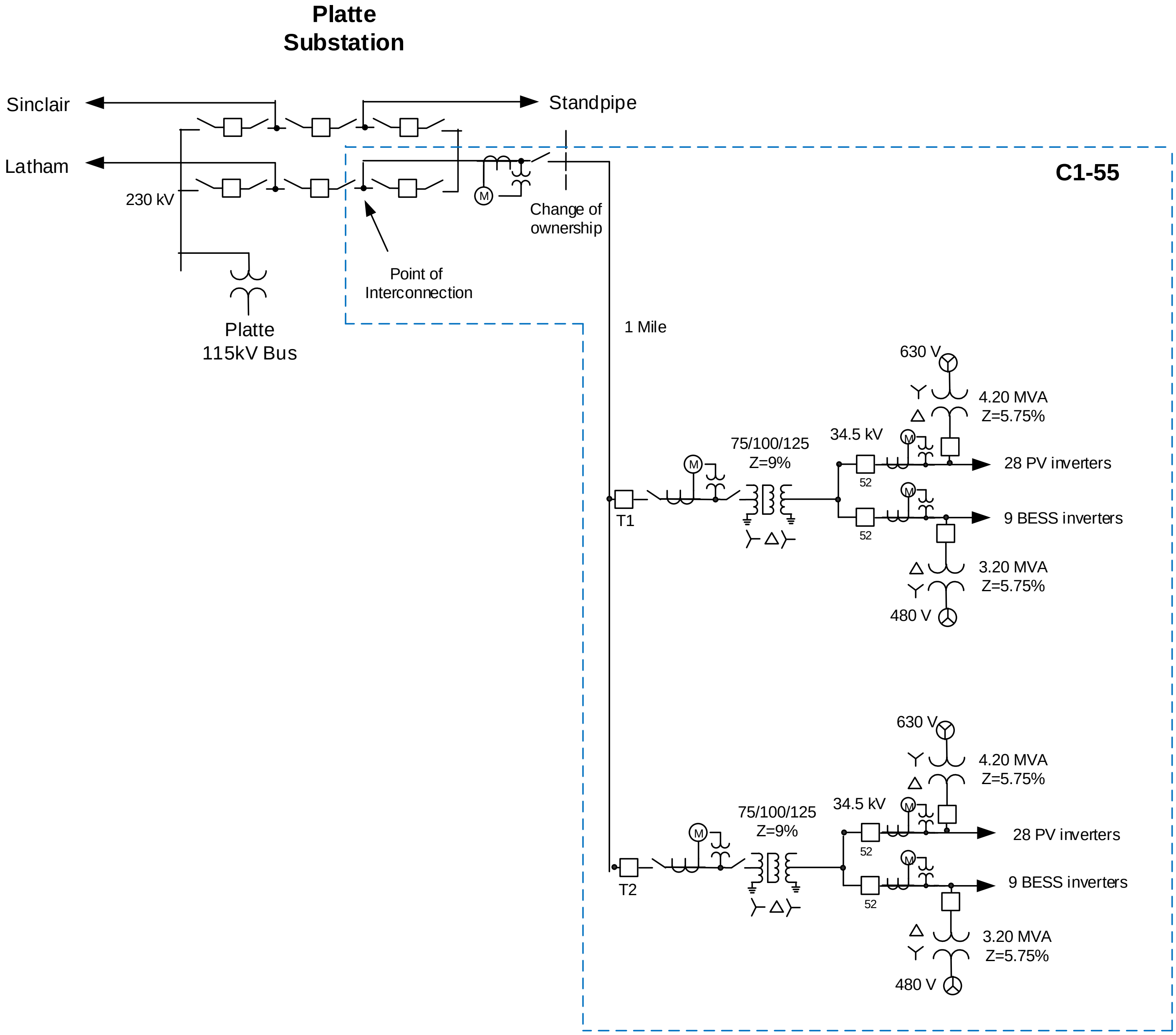


Figure 8: Simplified System One Line Diagram C1-55

5.8 Description of Interconnection Request – C1-57

The Interconnection Customer has proposed to interconnect 100 megawatts ("MW") of new generation to PacifiCorp's ("Transmission Provider") 230 kV Shirley Basin substation located in Carbon County, Wyoming. The Interconnection Request is proposed to consist of thirty-four (34) 3.367 kVA GE wind turbine generators for a total output of 100 MW at the POI. The requested commercial operation date is December 31, 2025. The Large Generating Facility is proposed to interconnect to the Shirley Basin 230 kV substation through one 230/34.5 kV 136 MVA auto transformers and a 4.5 mile long 230 kV transmission line. Figure 9 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

Interconnection Customer will NOT operate this generator as a Qualified Facility as defined by the Transmission Provider Regulatory Policies Act of 1978 (PURPA).

The Interconnection Request will be studied for Energy Resource Interconnection Service ("ERIS").

The Transmission Provider has assigned the Project Cluster Number "C1-57"

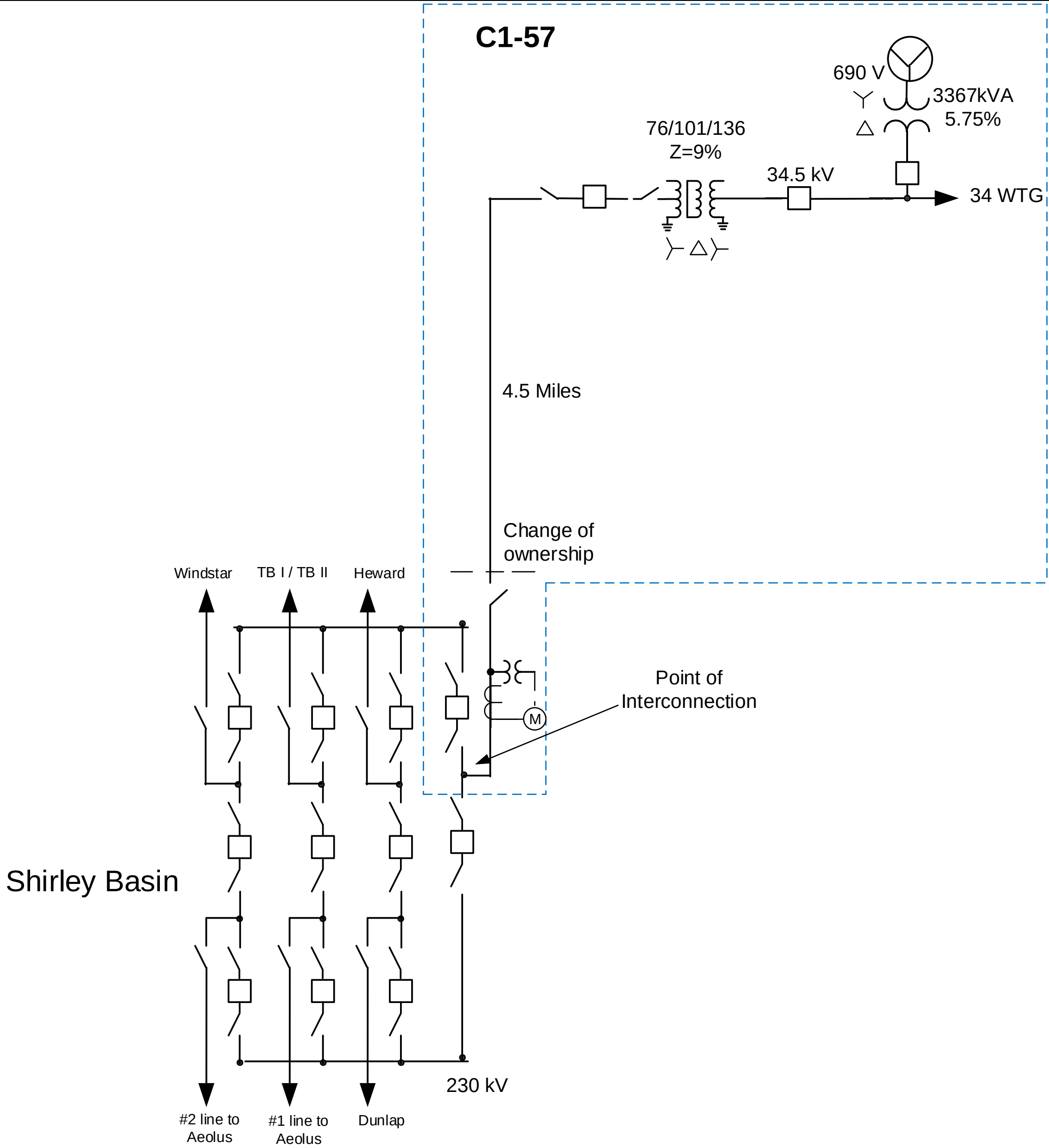


Figure 9: Simplified System One Line Diagram C1-57

5.9 Description of Interconnection Request – C1-59

The Interconnection Customer has proposed to interconnect 300 megawatts ("MW") of new solar and battery storage generation to PacifiCorp's ("Transmission Provider") 230 kV Windstar substation located in Converse County, Wyoming. The Interconnection Request is proposed to consist of one hundred thirty-eight (138) SMA Sunny Central 2750-EV-US 2.67 kVA solar inverters for a total output of 300 MW at the POI. The Interconnection Request will also consist of one hundred thirty-eight (138) SMA Sunny Central 2750-EV-US 2.67 kVA BESS inverters. The requested commercial operation date is June 1, 2024. The Large Generating Facility is proposed to interconnect to the Windstar 230 kV substation through one 230/34.5 kV 350 MVA auto transformers and a 4.5 mile long 230 kV transmission line. Figure 10 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

Interconnection Customer will NOT operate this generator as a Qualified Facility as defined by the Transmission Provider Regulatory Policies Act of 1978 (PURPA).

The Interconnection Request will be studied for both Network Resource Interconnection Service ("NRIS") and Energy Resource Interconnection Service ("ERIS").

The Transmission Provider has assigned the Project Cluster Number "C1-59"

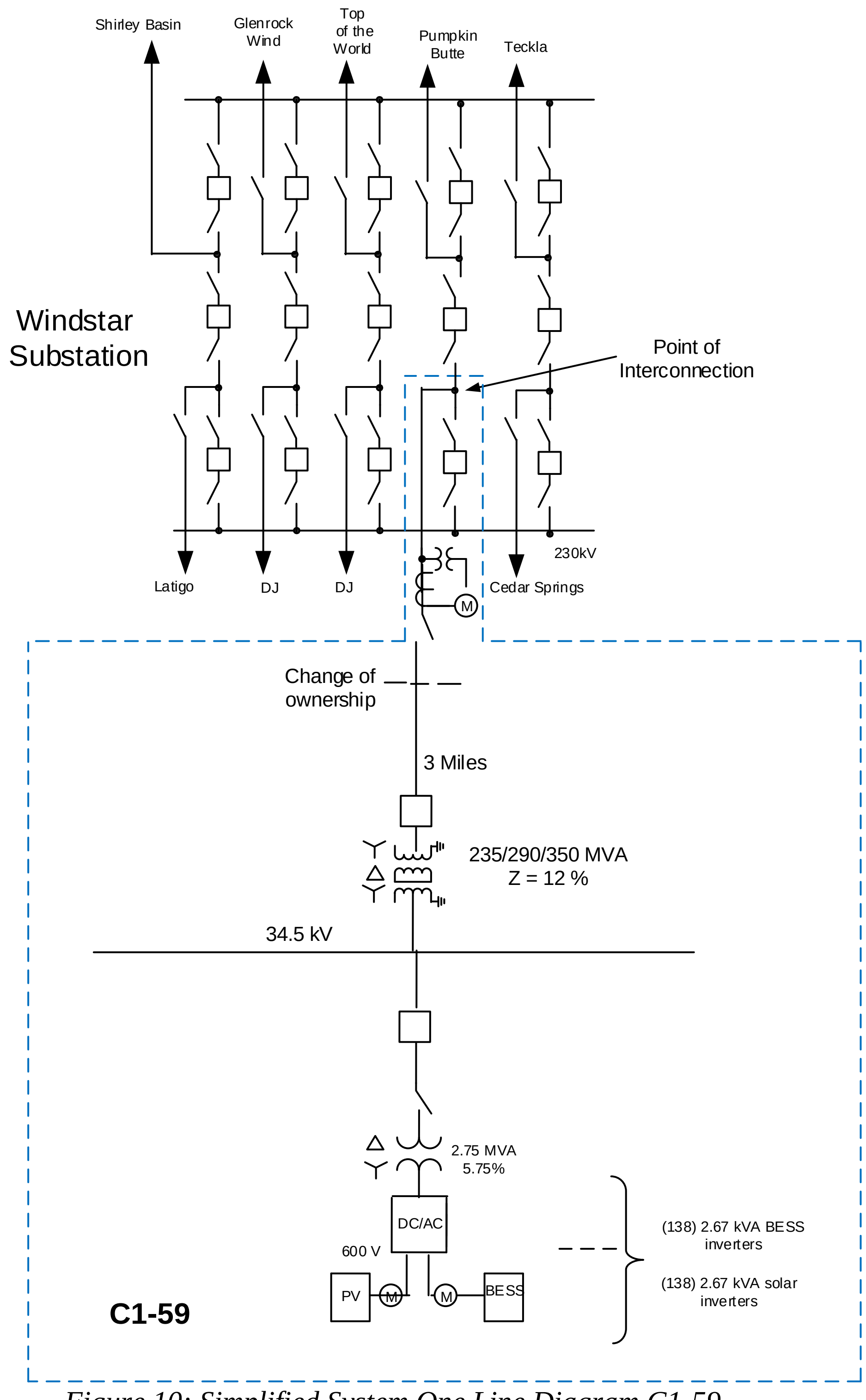


Figure 10: Simplified System One Line Diagram C1-59

6.0 SITE SPECIFIC GENERATING FACILITY REQUIREMENTS

In addition to the requirements described above the following Generating Facility are required for the specific Interconnection Requests listed below.

- All projects interconnecting to the Aeolus, Shirley Basin, and Windstar substation will need to participate in a voltage coordination study.
- Due to low short circuit ratio in Wyoming, the Cluster projects will be required to perform an SSCI study in order to ensure that their project is not susceptible to SSCI due to its close proximity to series compensated transmission lines.

C1-48

Based on the technical data provided by the Interconnection Customer, the proposed Large Generating Facility does not meet the capacitive power factor of 0.95. The additional shunt capacitors provided as part of the technical data were also considered in the model. The Interconnection Customer will have to ensure that it meets the +/- 0.95 power factor on the high side of the 230/34.5 step-up transformers.

C1-02

The Interconnection Customer will be required to install a transformer that will hold the phase to neutral voltages within limits when the Small Generating Facility is isolated with the Transmission Provider's local system until the generation disconnects. The circuit that the Project is connecting to is a four wire multi-grounded circuit with line to neutral connected load. Figure 2 shows the addition of a wye – delta grounding transformer of adequate power size and impedance that will meet the requirement.

C1-03

The Interconnection Customer will be required to install a transformer that will hold the phase to neutral voltages within limits when the Small Generating Facility is isolated with the Transmission Provider's local system until the generation disconnects. The circuit that the Project is connecting to is a four wire multi-grounded circuit with line to neutral connected load. Figure 3 shows the addition of a wye – delta grounding transformer of adequate power size and impedance that will meet the requirement.

7.0 TRANSMISSION PROVIDER SYSTEM REQUIREMENTS - ERIS

7.1 Transmission System Requirements

In addition to the interconnection requirements, the following transmission system improvements are required to accommodate the Interconnection Requests in this Cluster Area:

- Construct a new 50 percent series compensated 170-mile long 500 kV line between the Transmission Provider's Shirley Basin and Anticline substations. The following are required to support the new transmission line:
  - Install series compensation near Latham similar to the Aeolus–Anticline 500 kV line.
  - Install line shunt reactors of similar size as the Gateway Segment D.2 and neutral reactors to enable single pole trip and reclose.
  - The new transmission line will have one full transposition between Shirley Basin and Anticline.
  - Improvements required at Shirley Basin Substation:
    - Expand the 230 kV substation to add one new 230 kV bay
    - Three (3) new 230 kV breakers and associated switches to terminate the 500/230 kV auto transformer #1 and transformer #2
    - One (1) new 230 kV breaker for the 100 MVAR shunt capacitor bank

- Construct a new 500 kV breaker and half substation at Shirley Basin. Substation may be required to be expanded to the west
- Two new bays with five (5) new 500 kV breakers and associated switches
- One (1) 500 kV breaker for the shunt capacitor bank
- Install two (2) new 1600/1792 MVA (continuous/ emergency) 500/230 kV auto transformer at Shirley Basin
- Install one new 200 MVAR shunt capacitor bank at Shirley Basin 500 kV bus
- Install one new 100 MVAR shunt capacitor bank at Shirley Basin 230 kV bus

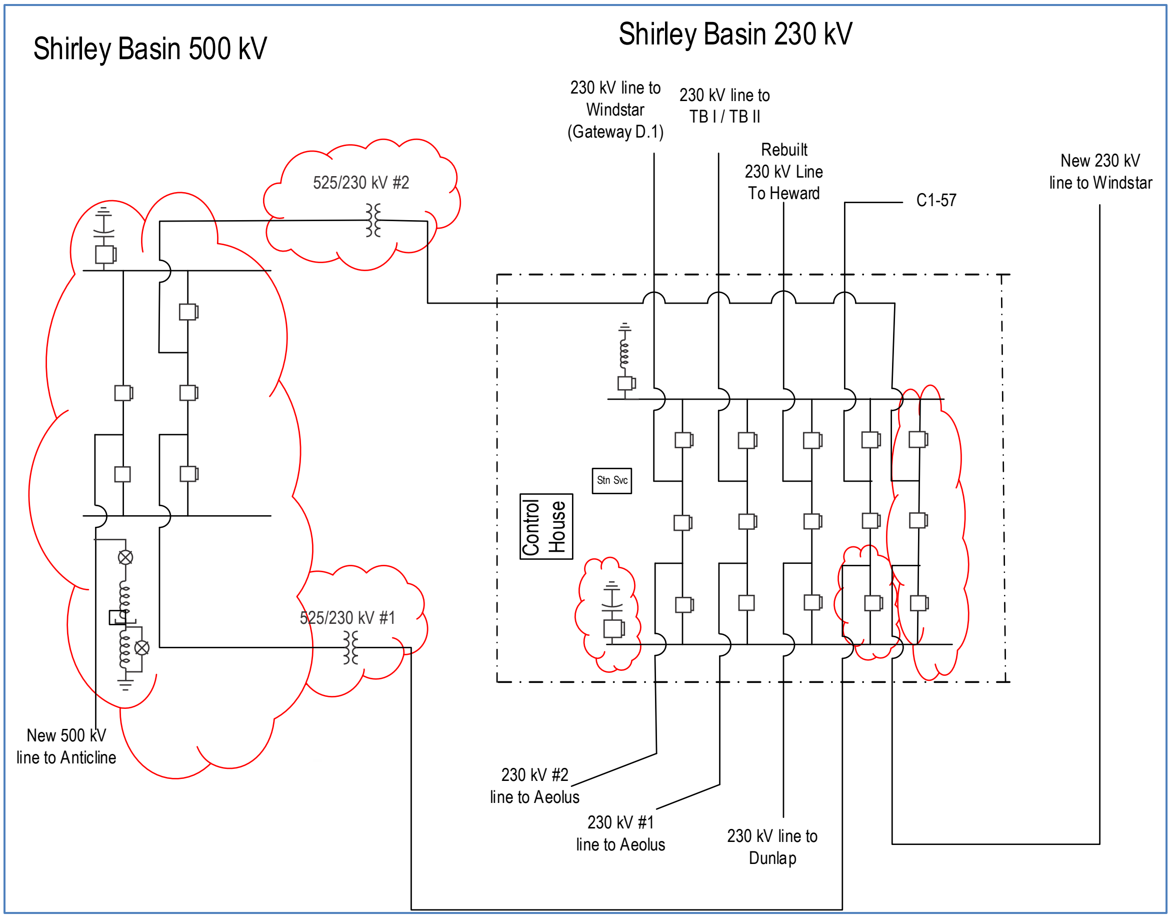


Figure 11: Improvements at Shirley Basin

- Improvements required at Anticline Substation:
  - Install a new breaker and associated switches for the 500 kV line to Shirley Basin

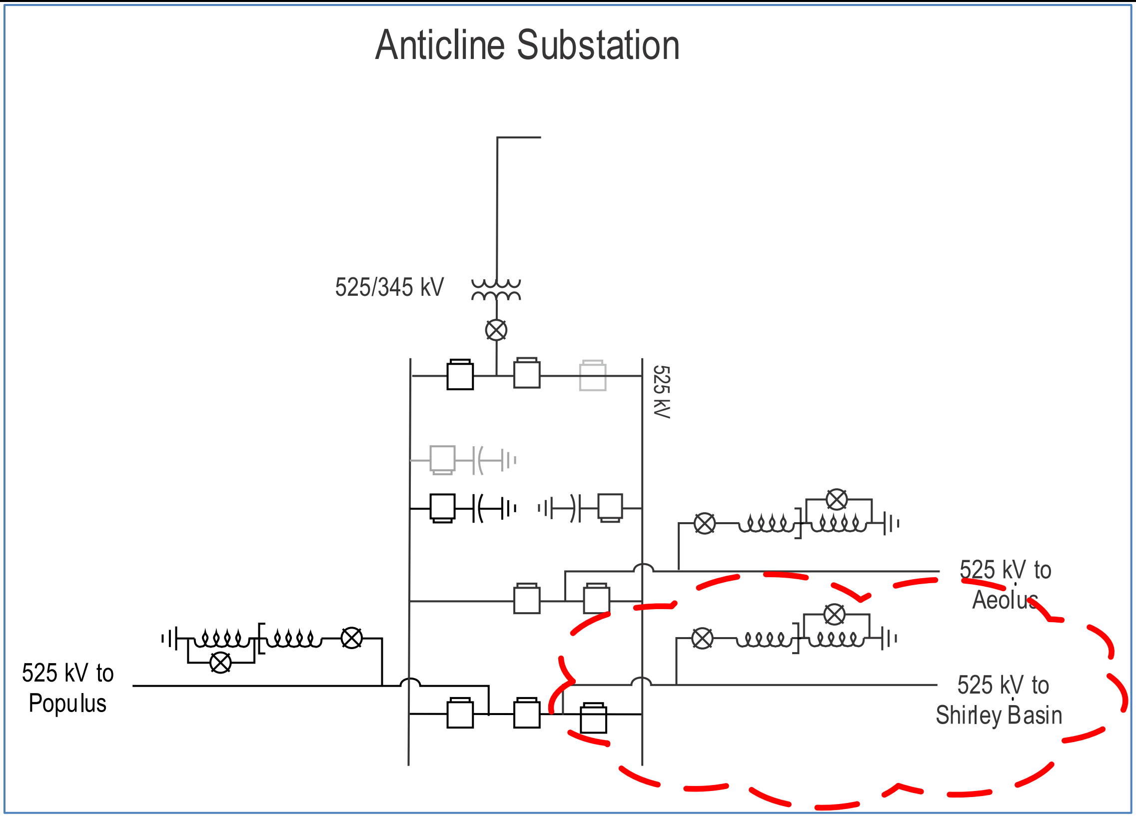


Figure 12: Improvements at Anticline

- Improvements required near Latham for series compensation**:**
  - Install two segments of series compensation with bypass breakers

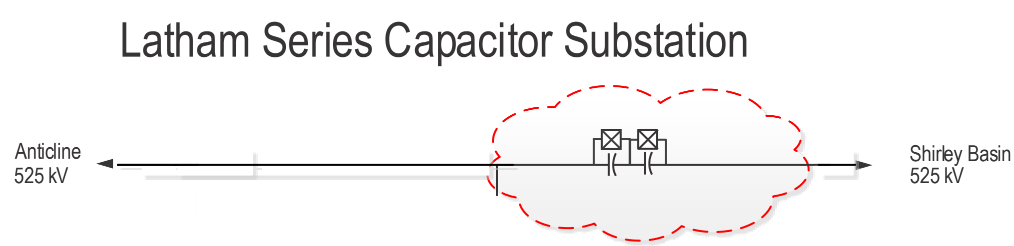


Figure 13: Improvements near Latham

- Construct a new 50 percent series compensated 416-mile long 500 kV line between Aeolus – Clover with same specifications as Transmission Provider planned Energy Gateway South 500 kV line.
  - Install series compensation at Little Snake and Coyote stations similar to the Gateway South Aeolus–Clover #1 500 kV line.
    - Install line shunt reactors of similar size as the Gateway South and neutral reactors to enable single pole trip and reclose.
    - The conductor for the line would be triple bundle 3x1272 ACSR Bittern

- The new transmission line will have a total of three (3) complete transpositions between Aeolus and Clover with one transposition between Aeolus and Little Snake, the second between Little Snake and Coyote and the third between Coyote and Clover.

- Improvements required at Aeolus Substation:
  - Use an existing 500 kV bay with one (1) new 500 kV breaker and associated switches to terminate the Aeolus – Clover # 2 500 kV line.

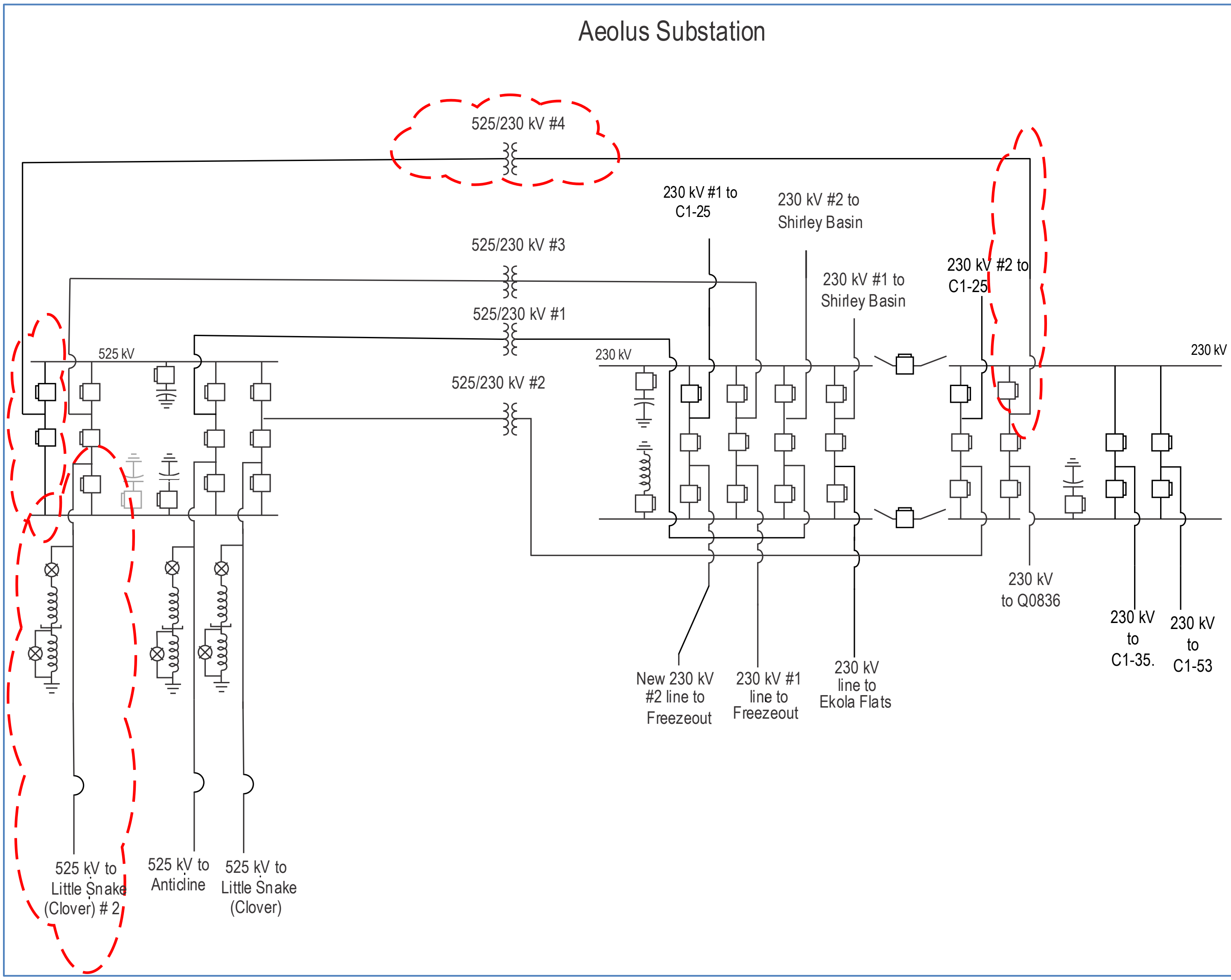


Figure 14: Improvements at Aeolus Substation

- Improvements required at Little Snake Substation:
  - Install two segments of series compensation with bypass breakers
  - Install line reactors with neutral reactors to enable single pole trip and reclose

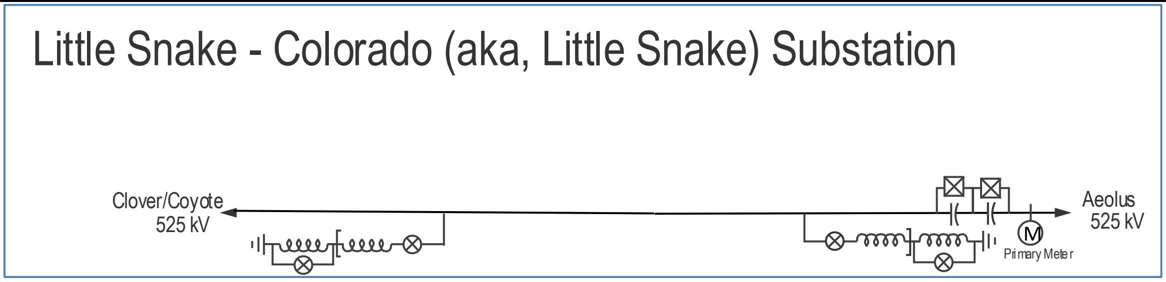


Figure 15: Improvements at Little Snake

- Improvements required at Coyote Substation:
  - Install two segments of series compensation with bypass breakers
  - Install line reactors with neutral reactors to enable single pole trip and reclose

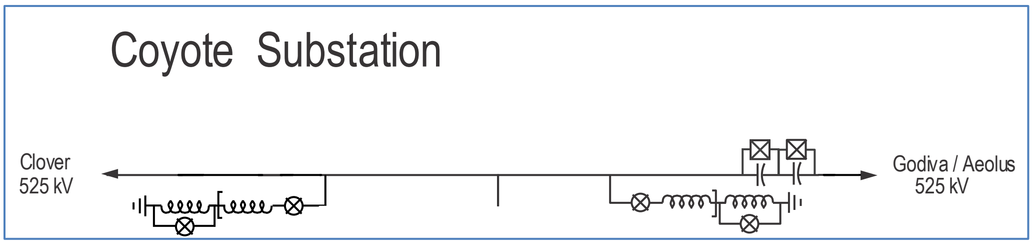


Figure 16: Improvements at Coyote Substation

- Improvements required at Clover Substation:
  - Use the existing 500 kV bay and install one (1) new 500 kV breaker to terminate the second Aeolus – Clover 500 kV # 2 lines.
  - Install the line reactors and neutral reactors required to enable the single pole trip and reclose.

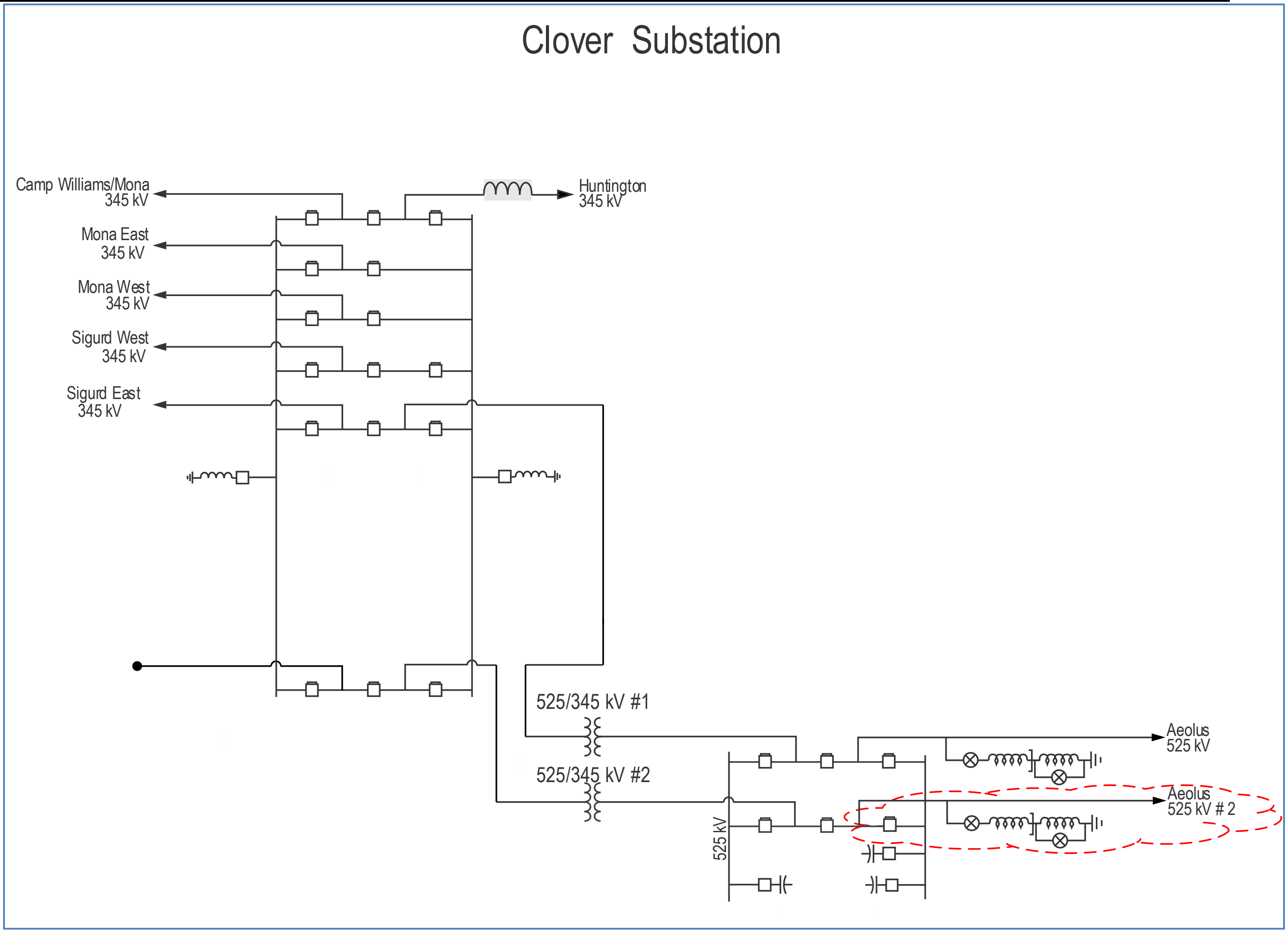


Figure 17: Improvements at Clover substation

- Install a fourth 500/230 kV auto transformer at Aeolus with 1600/1792 MVA (continuous/emergency) rating.
  - Use an existing 230 bay at Aeolus and install one (1) new 230 kV breaker and associated switches to terminate the fourth 500/230 kV auto transformer at Aeolus.
  - Construct a new 500 kV bay with two (2) new 500 kV breakers at Aeolus 500 kV to install and terminate the fourth 500/230 kV auto transformer.
  - Refer to Figure 14 above.

- Construct a new approximately 12 miles long 230 kV line between Freezeout and Standpipe substations with at bundled 2x1272 ACSR Bittern conductor.

  - Improvement at Freezeout Substation:
    - Expansion of the Freezeout substation will be required.
    - Install a new bay with two (2) new 230 kV breakers with associated switches to terminate the Freezeout – Standpipe 230 kV #2 line.

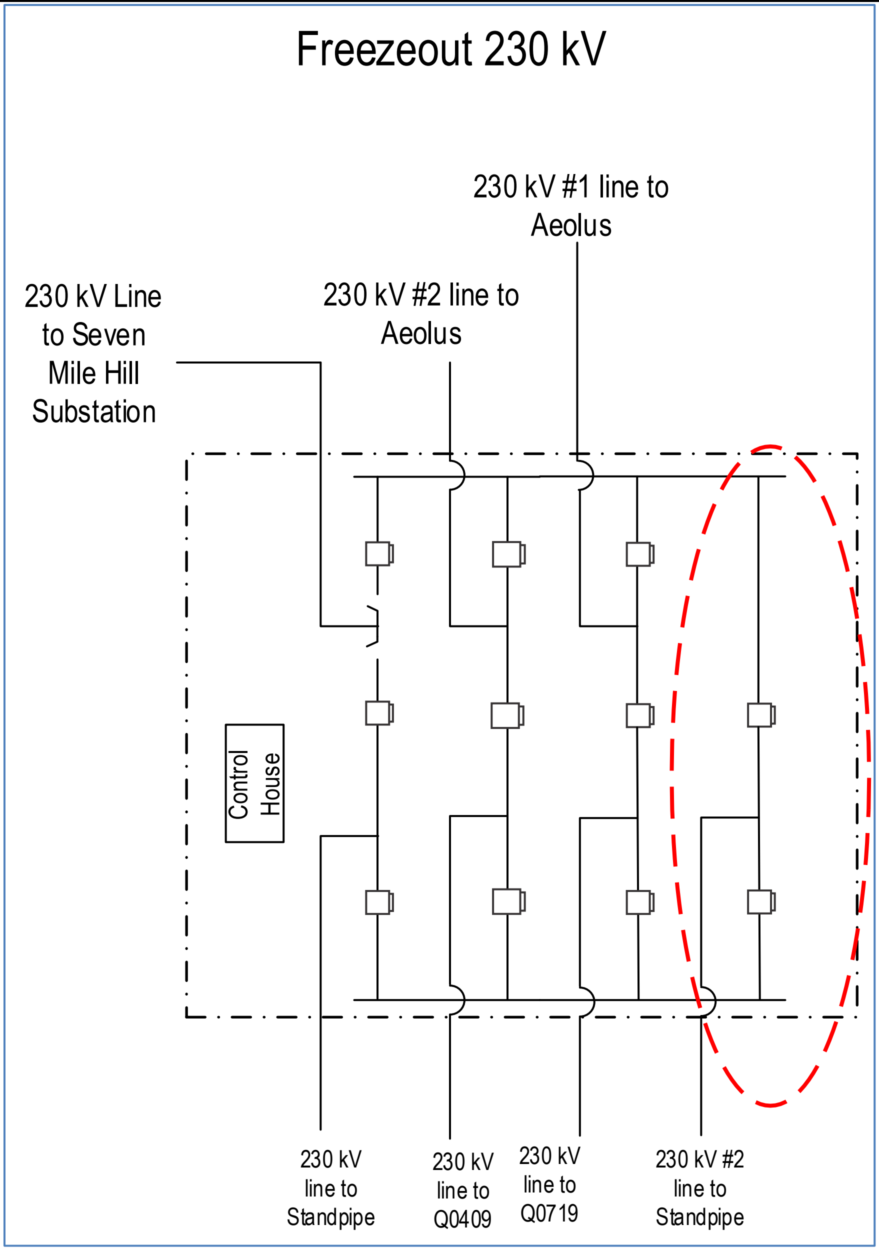


Figure 18: Improvements at Freezeout Substation

- Improvements at Standpipe substation
  - Use the existing 230 kV bay to install one (1) new 230 kV breaker and associated switches to terminate the Freezeout – Standpipe 230 kV # 2 transmission line.

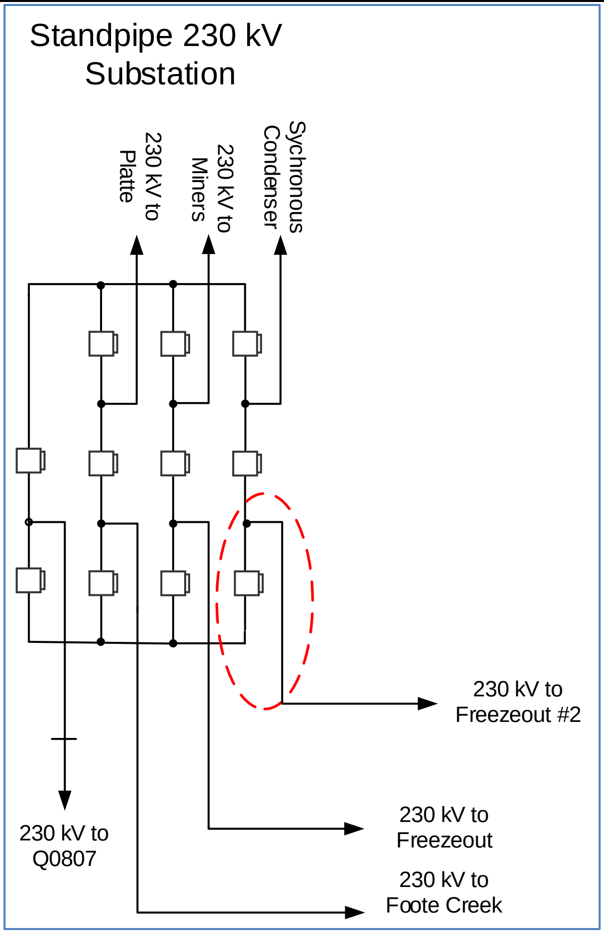


Figure 19: Improvements at Standpipe Substation

- Construct a second new approximately 59 mile Windstar–Shirley Basin 230 kV line with a bundled 2x1272 ACSR conductor.
    - The new transmission line will have one full transposition between Shirley Basin and Anticline.
    - Improvements at Shirley Basin 230 kV substation:
        - Using the new bay constructed for terminating the 500/230 kV auto transformer, install one (1) new 230 kV breaker and associated switches to terminate the Windstar – Shirley Basin # 2 230 kV line.
        - See figure 11 above.
    - Improvements at Windstar 230 kV Substation:
        - Construct a new 230 kV bay with two (2) new 230 kV breakers and associated switches to terminate the Windstar – Shirley Basin #2 230 kV line.

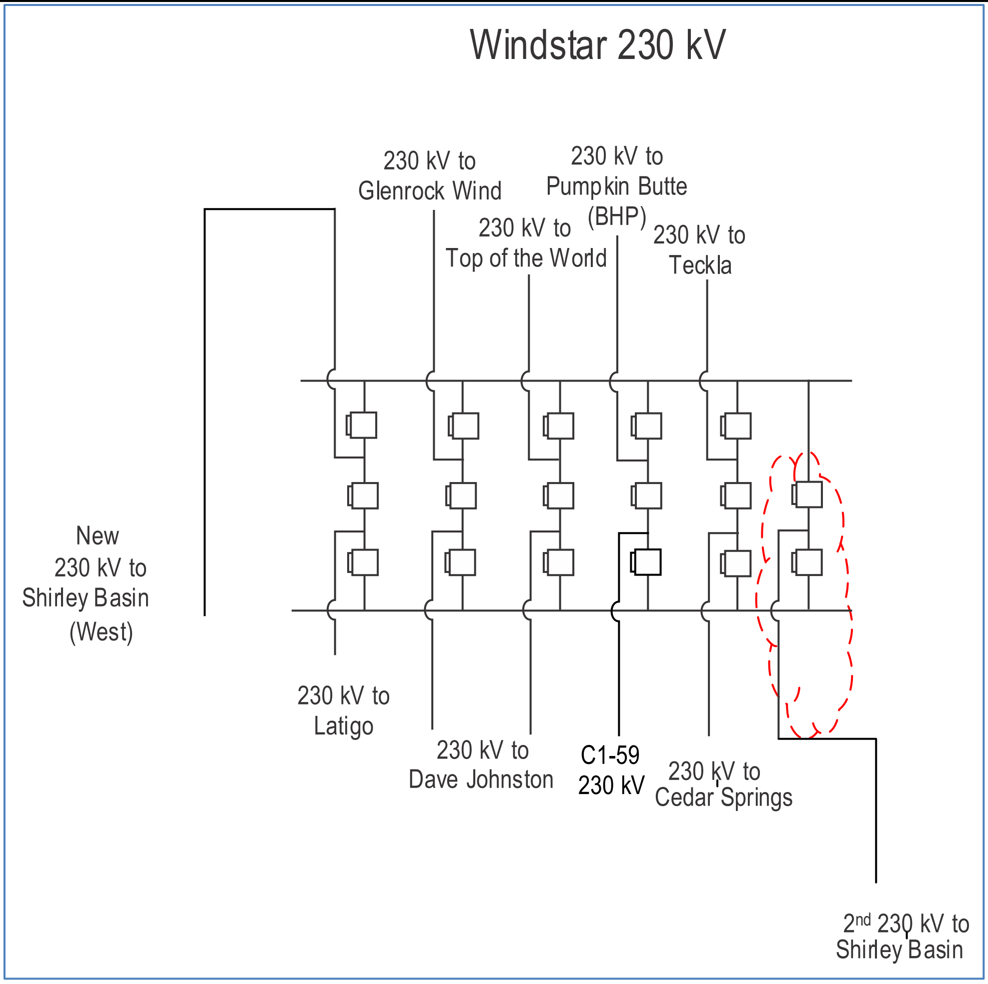


Figure 20: Improvements at Windstar Substation

- Rebuild approximately 5.5 miles of Clover Tap – Nebo 138 kV line with a 1272 ACSR Bittern conductor.
- Install a third 230/230 kV, 300/325 MVA (continuous/emergency) phase shifting transformer at Monument
  - Install one (1) new 230 kV breakers and associated switches in series with the phase shifter.

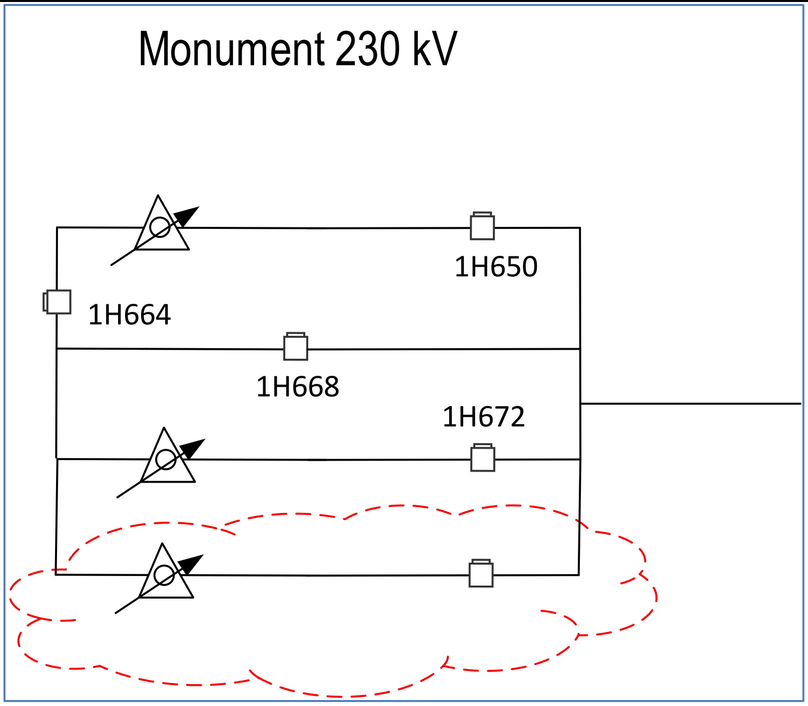
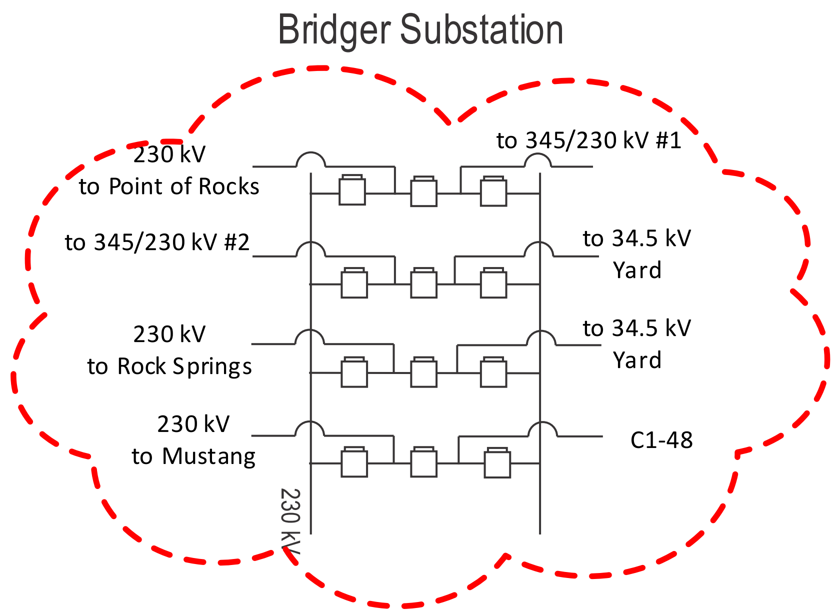


Figure 21: Improvements at Monument 230 kV

- Upgrade the Jim Bridger #1 and #3 345/230 kV auto transformers with a single 700/784 MVA (continuous/ emergency) auto transformer and upgrade the Jim Bridger 230 kV bus to breaker and half scheme due to the bus limitation
  - Construct a completely new 230 kV substation yard southeast to the existing 230 kV substation with four (4) new bays in a breaker and half configuration
  - Install eleven (11) new breakers and associated switches to terminate the existing 230 kV lines, 230/34.5 kV transformers and 345/230 kV auto transformers.
  - Add one (1) new 345 kV breaker on the bus for the new 700 MVA transformer that will replace the existing #1 and #3 transformer.



Convert the Jim Bridger 230 kV substation from a six breaker ring bus to a 11 breaker, breaker and half scheme. The 230 kV bus at Jim Bridger is limiting and cannot support the two 700 MVA transformer banks.

Figure 22: Improvements at Bridger 230 kV Substation

- Install automatic protection scheme at Riverton to control the shunt capacitor banks under high voltage
- Install automatic protection scheme at Mustang to control the shunt capacitor banks under high voltage scenarios

Refer to Appendix 1 for more details regarding the necessity for these required upgrades.

The following are station upgrades required for each of the Interconnection Requests within this Cluster Area.

C1-25

In order to interconnect the Interconnection Customer's proposed Large Generating Facility two planned 230 kV bays at Aeolus will be required as shown in Figure 4 above. The Project will interconnect to the same bay as the planned Aeolus–Freezeout #2 line and the planned Aeolus 500/230 kV #2 auto transformer. The Interconnection Request will also require the following:

- Two line terminations along with the required switches
- Two (2) 230 kV breakers and associated switches
- Add C1-25 to Aeolus RAS if it is in generation mode for the 500 kV line outages

C1-35

- Expand the Aeolus substation as necessary
- One new bay with two 230 kV breakers and associated switches

- Add C1-35 to the Aeolus RAS for the 500 kV line outages that require generation tripping

C1-48
In addition to the Jim Bridger 230 kV substation being upgraded to a breaker and half layout as required for the replacement of Jim Bridger transformer #1 & #3, the following are required at Jim Bridger substation for the C1-48 Interconnection Request:

- One new line termination with its associated switches
- One new 230 kV breaker

C1-53
- Expand the Aeolus substation as necessary
- One new bay with two 230 kV breakers and associated switches
- Add C1-53 to the Aeolus RAS for the 500 kV line outages that require generation tripping

C1-55
The Interconnection Request will utilize an existing bay at Platte with the following additions:
- One new line termination with its associated switches
- One new 230 kV breaker and its associated switches

C1-57
- One new bay in Shirley Bay substation with two 230 kV breakers and associated switches
- Add C1-57 to the Aeolus RAS for the 500 kV line outages that require generation tripping

C1-59
The proposed Interconnection Request will use an existing 230 kV bay at Windstar substation as shown in Figure 10 above. The Large Generating Facility will interconnect to the same bay as the existing Windstar–Pumpkin Butte 230 kV line. The Interconnection Requests will also require

- One line termination along with the required switches
- One (1) new 230 kV breakers and associated switches

7.2 Distribution System Requirements

C1-02
The Transmission Provider will install a line extension from its nearest existing structure to the Interconnection Customer's proposed Point of Interconnection. The line extension will contain a minimum of two poles with the first pole containing a disconnect switch and the second pole containing the required metering equipment.

C1-03
The Transmission Provider will install a line extension from its nearest existing structure to the Interconnection Customer's proposed Point of Interconnection. The line extension will contain a minimum of two poles with the first pole containing a disconnect switch and the second pole containing the required metering equipment.

7.3 Transmission Line Requirements

The following new transmission lines are required to be constructed for the Interconnection Requests in this Cluster Area. The Transmission Provider assumes new rights-of-way will be required and that portions of each line will cross federal land requiring environmental permitting.

- Construct a new ~170-mile long 500 kV line between the Transmission Provider's Shirley Basin and Anticline substations.
- Construct a new ~416-mile long 500 kV line between the Transmission Provider's Aeolus and Clover substation.
- Construct a new ~12 mile long 230 kV line between the Transmission Provider's Freezeout and Standpipe substations
- Construct a new ~59-mile line between the Transmission Provider's Windstar–Shirley Basin substations.

The following existing transmission line is required to be rebuilt for the Interconnection Requests in this Cluster Area.

- 5.5 miles of Clover Tap – Nebo 138 kV line.

Each of the Interconnection Requests in this Cluster Area shall construct its last structure and span/bus connection into the POI substation to Transmission Provider standards. The Transmission Provider will review the design of the Interconnection Customer line for the last span into the POI substations. The Interconnection Customers shall coil enough fiber and conductor on the last deadend structure to make the span into the POI substations. The Transmission Provider shall construct the final terminations into the POI substations.

If the Interconnection Customer's tie line is required to cross a Transmission Provider line, the Interconnection Customer shall make application with the Transmission Provider to do so. The Customer's line shall cross below the Transmission Provider's line in all cases unless the Customer's line is of a greater voltage.

7.4 Existing Circuit Breaker Upgrades – Short Circuit

C1-02

The increase in the fault duty on the system as the result of the addition of the Generating Facility with photovoltaic arrays, inverters and transformers as specified in the Interconnection Customer's application as shown in Figure 2, assuming transformers with 6.5% impedance will not push the fault duty above the interrupting rating of any of the existing fault interrupting equipment.

C1-03

The increase in the fault duty on the system as the result of the addition of the Generating Facility with photovoltaic arrays, inverters and transformers as specified in the Interconnection Customer's application as shown in Figure 3, assuming transformers with 6.5% impedance will not push the fault duty above the interrupting rating of any of the existing fault interrupting equipment.

C1-25

The increase in the fault duty on the system as the result of the addition of the generation facility fed through 3 – 333.3 MVA wind turbine generators connected to 3 – 220/275/366 MVA 230 kV – 18 kV transformers with 6.5 % impedance will not exceed the interrupting rating of any of the existing equipment.

C1-35
The increase in the fault duty on the system as the result of addition of the generation facility fed through 100 – 5 MW wind turbine generators connected to 100 – 6200 kVA 34.5 kV – 690V transformers with 2.9 % impedance then through four autotransformers 96/128/160 MVA with 10% impedance will not exceed the interrupting rating of any of the existing equipment.

C1-48
The increase in the fault duty on the system as the result of addition of the generation facility fed through 267 2.56 MVA wind turbine generators connected to 267 – 2.56 MVA 34.5 kV – 690V transformers with 5.75 % impedance then through four autotransformers 102/136/170 MVA with 8.5% impedance will not exceed the interrupting rating of any of the existing equipment.

C1-53
The increase in the fault duty on the system as the result of addition of the generation facility fed through 64 3.03 wind turbine generators connected to 64 – 3.367 MVA 34.5 kV – 690V transformers with 5.75 % impedance then through two autotransformers 71/95/119 MVA with 9% impedance will not exceed the interrupting rating of any of the existing equipment.

C1-55
The increase in the fault duty on the system as the result of the addition of the generation facility with photovoltaic arrays fed through 56 – 4.2 MVA inverters connected to 56 – 4.2 MVA 34.5 kV – 630 V transformers with 5.75% impedance and batteries fed through 18 – 3.20 MVA inverters connected to 39 – 3.20 MVA 34.5 kV – 480 V transformers with 5.75 % impedance then through two 230 – 34.5 kV 75/100/125 MVA transformers with 9% impedance will not exceed the interrupting rating of any of the existing equipment.

C1-57
The increase in the fault duty on the system as the result of addition of the generation facility fed through 34 3.367 MVA wind turbine generators connected to 34 – 3.367 MVA 34.5 kV – 690V transformers with 5.75 % impedance then through an autotransformer 76/101/136 MVA with 9% impedance will not exceed the interrupting rating of any of the existing equipment.

C1-59
The increase in the fault duty on the system as the result of addition of the generation facility fed through 138-2.67 MVA solar and Bess inverters connected to 138 – 2.75 MVA 34.5 kV – 600V transformers with 5.75 % impedance then through an autotransformer 235/290/350 MVA with 12% impedance will not exceed the interrupting rating of any of the existing equipment.

7.5 Protection Requirements

Shirley Basin Substation

- Install 411L relaying with current differential protection for the new 500kV Shirley Basin to Anticline line. The settings must consider the effect of series cap bank at Latham. The 500kV line will operate

with single phase tripping and reclosing. Communication channels will be required between the line terminals for the line relays to function. Due to the voltage that these lines operate at redundant diversely routed communication systems will be required to carry the signals for the dual line relays.
- Standard protection for line reactors with dual 387E relaying and variable percentage differential relay.
- Install standard EHV transformer differential protection to the two new 500/230kV autotransformers.
- Install 411L relaying with current differential protection to the 230kV line to Windstar.
- Install EHV shunt capacitor bank protection with dual 487V relaying to the shunt capacitor installed on the 500kV bus
- Fuseless capacitor bank protection with one 487V and 751 relaying to the shunt capacitor bank installed on 230kV bus
- Install EHV redundant bus differential protection to the two 500kV buses
- Modify the 230kV bus differential protection logic to add the new installed 230kV breakers

Anticline Substation
- Install 411L relaying with current differential protection for the new 500kV Anticline to Shirley Basin line. The settings must consider the effect of series cap bank at Latham. The 500kV line will operate with single phase tripping and reclosing. Communication channels will be required between the line terminals for the line relays to function. Due to the voltage that these lines operate at redundant diversely routed communication systems will be required to carry the signals for the dual line relays.
- Standard protection for line reactors with dual 387E relaying and variable percentage differential relay.

Aeolus Substation
- Install standard EHV transformer differential protection to the new 500/230kV autotransformer.
- Install standard EHV 411L relaying with POTT scheme to the line #2 to Clover.
- Standard protection for line reactors with dual 387E relaying and variable percentage differential relay.

Little Snake Substation
- Standard protection for line reactors with dual 387E relaying and variable percentage differential relay.

Coyote Substation
- Standard protection for line reactors with dual 387E relaying and variable percentage differential relay.

Clover Substation
- Install 411L relaying with current differential protection for the new 500kV Clover to Aeolus line. The settings must consider the effect of series cap bank at Little Snake. The 500kV line will operate with single phase tripping and reclosing. Communication channels will be required between the line terminals for the line relays to function. Due to the voltage that these lines operate at redundant diversely routed communication systems will be required to carry the signals for the dual line relays.
- Standard protection for line reactors with dual 387E relaying and variable percentage differential relay.

Freezeout Substation
- Install standard 411L relaying with current differential protection for the new 230kV line to Standpipe.

Standpipe Substation
- Install standard 411L relaying with current differential protection for the new 230kV line to Freezeout.

Windstar Substation

- Install standard 411L relaying with current differential protection for the new 230kV Shirley Basin line.

Monument Substation

- Install standard phase shifting transformer differential protection for the new phase angle transformer

Jim Bridger Substation

- Install standard transformer differential protection to the new 700MVA transformer. Add bus differential protection to the two 230kV buses.

Riverton Substation

- Install programmable logic control (SEL-2411) for automatic protection scheme to control the shunt capacitor banks

Mustang Substation

- Install programmable logic control (SEL-2411) for automatic protection scheme to control the shunt capacitor banks

C1-02

Protective relaying systems will need to be installed that will detect faults and cause the disconnection of the Generating Facility for: a) 34.5kV line faults on circuit 9H182 out of Frannie substation, faults in the 230 – 34.5 kV transformers at Frannie substation, and faults on the 230kV line out of Frannie to Yellowtail and Oregon Basin (Figure 2). To accomplish this minimum system stated below are required.

Faults in the 34.5kV distribution circuit will be cleared by timely operation of circuit breaker 9H182. The faults will be detected by overcurrent relay elements at Frannie. The existing relays do not have the specifications required in this case. It is recommended to replace the existing relay panel with a standard panel holding a SEL-751 relay and associated equipment. This relay will set to be directional; this explains the need for a set of three 34.5kV line potential transformers at the substation. The relay will also be set to produce successive automatic reclosing operations of the line breaker (9H182) to automatically recover the service for temporary faults.

The reclosing should not take place when the Generating Facility is connected to the distribution feeder; therefore, the relay will not execute the reclosing order unless the line is de-energized ("dead-line checking"). This requires the installation of 34.5kV line potential transformers.

As the generation capacity of the new Generating Facility will surpass the feeder's load during certain daylight periods, the deadline checking scheme may lead to a condition with 9H182 circuit breaker open for long periods of time. This will be avoided by sending direct transfer trip to the facility's main recloser (or circuit breaker) from the 9H182 SEL-751 relays through an optical fiber cable anytime 9H182 is open.
At the Interconnection Customer's substation, a protective relay will be installed to perform the following functions:

- Receive transfer trip from Frannie substation
- Detect faults on the 34.5kV at the Generating Facility
- Detect faults on the 34.5kV line to Frannie substation
- Monitor the voltage and react to under or over frequency, and / or magnitude of the voltage

All these relaying functions are part of one protective relay.

All the protective relaying that has been noted in this report is for the protection and safe, reliable operation of the distribution and transmission facilities. Additional relaying is needed for detecting problems in the Generating Facility. The relaying for the plant is the responsibility of the Interconnection Customer.

C1-03

Protective relaying systems will need to be installed that will detect faults and cause the disconnection of the Generating Facility for: a) 34.5kV line faults on circuit 9H184 out of Frannie substation, faults in the 230 – 34.5 kV transformers at Frannie substation, and faults on the 230kV line out of Frannie to Yellowtail and Oregon Basin (Figure 3). To accomplish this minimum system stated below are required.

Faults in the 34.5kV distribution circuit will be cleared by timely operation of circuit breaker 9H184. The faults will be detected by overcurrent relay elements at Frannie. The existing relays do not have the specifications required in this case. It is recommended to replace the existing relay panel with a standard panel holding a SEL-751 relay and associated equipment. This relay will set to be directional; this explains the need for a set of three 34.5kV line potential transformers at the substation. The relay will also be set to produce successive automatic reclosing operations of the line breaker (9H184) to automatically recover the service for temporary faults.

The reclosing should not take place when the Generating Facility is connected to the distribution feeder; therefore, the relay will not execute the reclosing order unless the line is de-energized ("dead-line checking"). This requires the installation of 34.5kV line potential transformers.

As the generation capacity of the new Generating Facility will surpass the feeder's load during certain daylight periods, the deadline checking scheme may lead to a condition with 9H184 circuit breaker open for long periods of time. This will be avoided by sending direct transfer trip to the facility's main recloser (or circuit breaker) from the 9H184 SEL-751 relays through an optical fiber cable anytime 9H184 is open.
At the Interconnection Customer's substation, a protective relay will be installed to perform the following functions:

- Receive transfer trip from Frannie substation
- Detect faults on the 34.5kV at the Generating Facility
- Detect faults on the 34.5kV line to Frannie substation
- Monitor the voltage and react to under or over frequency, and / or magnitude of the voltage

All these relaying functions are part of one protective relay.

All the protective relaying that has been noted in this report is for the protection and safe, reliable operation of the distribution and transmission facilities. Additional relaying is needed for detecting problems in the Generating Facility. The relaying for the plant is the responsibility of the Interconnection Customer.

C1-02 & C1-03 combined

For 230/34.5 kV transformer faults the existing relaying at Frannie substation will key transfer trip. In addition to that, faults in the 230kV line, which are currently cleared by the existing line protection scheme, will have a contribution from the generation plant. To detect those faults in the 230kV lines, two multifunction relays (SEL-411Ls) will be installed using the existing 230kV current transformers as indicated in Figure 2&3. Three new 230kV voltage transformers are needed in this scheme. When a fault is detected in the direction from 34.5kV to 230kV, the relays will send transfer trip to the plant recloser (or breaker) through the feeder 9H182 & 9H184 SEL-751 and optical fiber channel.

Beckwith controls on both the transformers will need to be replaced with M-2001C to be able to detect reverse power flow.

C1-25

The tie-lines between Aeolus and the Interconnection Customer substation will be protected with current differential scheme. Transmission line relays will need to be installed at Aeolus and a panel with compatible line relays will be installed at the Interconnection Customer substation.

Relay elements for under/over voltage and over/under frequency protection of the system will be enabled in the line relays for the tie line to the customer substation installed at Aeolus. If the voltage, magnitude or frequency, is outside of the normal operation range these relay elements will cause the tripping of the 230 kV breakers at Aeolus and breakers at customer substation.

C1-35

The tie-line between Aeolus and the Interconnection Customer substation will be protected with current differential scheme. Transmission line relays will need to be installed at Aeolus and a panel with compatible line relays will be installed at the Interconnection Customer substation.

Relay elements for under/over voltage and over/under frequency protection of the system will be enabled in the line relays for the tie line to the customer substation installed at Aeolus. If the voltage, magnitude or frequency, is outside of the normal operation range these relay elements will cause the tripping of the 230 kV breakers at Aeolus and breakers at customer substation.

C1-48

The tie-line between Bridger and the Interconnection Customer substation will be protected with current differential scheme. Transmission line relays will need to be installed at Bridger and a panel with compatible line relays will be installed at the Interconnection Customer substation.

Relay elements for under/over voltage and over/under frequency protection of the system will be enabled in the line relays for the tie line to the customer substation installed at Bridger. If the voltage, magnitude or frequency, is outside of the normal operation range these relay elements will cause the tripping of the 230 kV breakers at Bridger and breakers at customer substation.

C1-53

The tie-line between Aeolus and the Interconnection Customer substation will be protected with current differential scheme. Transmission line relays will need to be installed at Aeolus and a panel with compatible line relays will be installed at the Interconnection Customer substation.

Relay elements for under/over voltage and over/under frequency protection of the system will be enabled in the line relays for the tie line to the customer substation installed at Aeolus. If the voltage, magnitude or frequency, is outside of the normal operation range these relay elements will cause the tripping of the 230 kV breakers at Aeolus and breakers at customer substation.

C1-55

The tie-line between Platte and the Interconnection Customer substation will be protected with current differential scheme. Transmission line relays will need to be installed at Platte and a panel with compatible line relays will be installed at the Interconnection Customer substation.

Relay elements for under/over voltage and over/under frequency protection of the system will be enabled in the line relays for the tie line to the customer substation installed at Platte. If the voltage, magnitude or frequency, is outside of the normal operation range these relay elements will cause the tripping of the 230 kV breakers at Platte and breakers at customer substation.

C1-57

The tie-lines between Shirley Basin and the Interconnection Customer substation will be protected with current differential scheme. Transmission line relays will need to be installed at Shirley Basin and a panel with compatible line relays will be installed at the Interconnection Customer substation.

Relay elements for under/over voltage and over/under frequency protection of the system will be enabled in the line relays for the tie line to the customer substation installed at Shirley Basin. If the voltage, magnitude or frequency, is outside of the normal operation range these relay elements will cause the tripping of the 230 kV breakers at Shirley Basin and breakers at customer substation.

C1-59

The tie-line between Windstar and the Interconnection Customer substation will be protected with current differential scheme. Transmission line relays will need to be installed at Windstar and a panel with compatible line relays will be installed at the Interconnection Customer substation.

Relay elements for under/over voltage and over/under frequency protection of the system will be enabled in the line relays for the tie line to the customer substation installed at Windstar. If the voltage, magnitude or frequency, is outside of the normal operation range these relay elements will cause the tripping of the 230 kV breakers at Windstar and breakers at customer substation.

7.6 Data (RTU) Requirements

C1-02

Hard-wired signals to the Primary RTU at the collector substation:

Analogs:

- 34.5 kV Real power PV Breaker 1
- 34.5 kV Reactive power PV Breaker 1
- Global Horizontal Irradiance (GHI)
- Average Plant Atmospheric Pressure (Bar)
- Average Plant Temperature (Celsius)
- Max Gen Limit MW Set Point Feed Back
- Potential Power MW

Analog Written to the RTU:

- Max Gen Limit MW Set Point

<u>Status:</u>

- 34.5 kV PV breaker 1

Primary RTU acquiring serial data from one primary meter at the collector substation:
<u>Analogs:</u>

- Generation MW
- Generator MVAr
- Energy Register kWh

Backup RTU acquiring serial data from one backup meters at the collector substation:
<u>Analogs:</u>

- Generation MW
- Generator MVAr
- Energy Register kWh

From Frannie Substation:
Provide a controls interface for new LTC at existing 230 – 34.5 kV transformer.

C1-03
Hard-wired signals to the Primary RTU at the collector substation:
<u>Analogs:</u>

- 34.5 kV Real power PV Breaker 1
- 34.5 kV Reactive power PV Breaker 1
- Global Horizontal Irradiance (GHI)
- Average Plant Atmospheric Pressure (Bar)
- Average Plant Temperature (Celsius)
- Max Gen Limit MW Set Point Feed Back
- Potential Power MW

<u>Analog Written to the RTU:</u>

- Max Gen Limit MW Set Point

<u>Status:</u>

- 34.5 kV PV breaker 1

Primary RTU acquiring serial data from one primary meter at the collector substation:
<u>Analogs:</u>

- Generation MW
- Generator MVAr
- Energy Register kWh

Backup RTU acquiring serial data from one backup meters at the collector substation:
<u>Analogs:</u>

- Generation MW
- Generator MVAr
- Energy Register kWh

From Frannie Substation:
Provide a controls interface for new LTC at existing 230 – 34.5 kV transformer.

C1-25
Hard-wired signals to the Primary RTU at the collector substation:
Analogs:

- Real power flowing through the #1 230 – 18 kV transformer
- Reactive power flowing through the #1 230 – 18 kV transformer
- Real power flowing through the #2 230 – 18 kV transformer
- Reactive power flowing through the #2 230 – 18 kV transformer
- Real power flowing through the #3 230 – 18 kV transformer
- Reactive power flowing through the #3 230 – 18 kV transformer
- Average Plant Temperature (Celsius)
- Max Gen Limit MW Set Point Feed Back
- Potential Power MW
- 230 kV A phase voltage Line 1
- 230 kV B phase voltage Line 1
- 230 kV C phase voltage Line 1
- 230 kV A phase voltage Line 2
- 230 kV B phase voltage Line 2
- 230 kV C phase voltage Line 2

Analog Written to the RTU:
- Max Gen Limit MW Set Point

Status:
- 230 kV GEN breaker 1
- 230 kV GEN breaker 2
- 230 kV GEN breaker 3
- 230 kV GEN breaker 4
- 230 kV GEN breaker 5
- 230 kV GEN breaker 6
- 230 kV GEN breaker 7
- 230 kV GEN breaker 8

From Aeolus Substation:

Primary RTU acquiring serial data from the two primary meters at the substation:
Analogs:
- Generation MW

- Generator MVAr
- Energy Register kWh

Backup RTU acquiring serial data from the two backup meters at the substation:
<u>Analogs:</u>

- Generation MW
- Generator MVAr
- Energy Register kWh

Provide a controls interface for two new 230 kV breakers.

C1-35
Hard-wired signals to the Primary RTU at the collector substation:
<u>Analogs:</u>

- Real power flowing through the T1 230 – 34.5 kV transformer
- Reactive power flowing through the T1 230 – 34.5 kV transformer
- 34.5 kV Real power WTG Breaker F1-1
- 34.5 kV Reactive power WTG Breaker F1-1
- 34.5 kV Real power WTG Breaker F1-2
- 34.5 kV Reactive power WTG Breaker F1-2
- 34.5 kV Real power WTG Breaker F1-3
- 34.5 kV Reactive power WTG Breaker F1-3
- 34.5 kV Real power WTG Breaker F1-4
- 34.5 kV Reactive power WTG Breaker F1-4
- 34.5 kV Real power WTG Breaker F1-5
- 34.5 kV Reactive power WTG Breaker F1-5
- 34.5 kV Real power WTG Breaker F1-6
- 34.5 kV Reactive power WTG Breaker F1-6
- Real power flowing through the T2 230 – 34.5 kV transformer
- Reactive power flowing through the T2 230 – 34.5 kV transformer
- 34.5 kV Real power WTG Breaker F2-1
- 34.5 kV Reactive power WTG Breaker F2-1
- 34.5 kV Real power WTG Breaker F2-2
- 34.5 kV Reactive power WTG Breaker F2-2
- 34.5 kV Real power WTG Breaker F2-3
- 34.5 kV Reactive power WTG Breaker F2-3
- 34.5 kV Real power WTG Breaker F2-4
- 34.5 kV Reactive power WTG Breaker F2-4
- 34.5 kV Real power WTG Breaker F2-5
- 34.5 kV Reactive power WTG Breaker F2-5
- Real power flowing through the T3 230 – 34.5 kV transformer
- Reactive power flowing through the T3 230 – 34.5 kV transformer
- 34.5 kV Real power WTG Breaker F3-1
- 34.5 kV Reactive power WTG Breaker F3-1

- 34.5 kV Real power WTG Breaker F3-2
- 34.5 kV Reactive power WTG Breaker F3-2
- 34.5 kV Real power WTG Breaker F3-3
- 34.5 kV Reactive power WTG Breaker F3-3
- 34.5 kV Real power WTG Breaker F3-4
- 34.5 kV Reactive power WTG Breaker F3-4
- 34.5 kV Real power WTG Breaker F3-5
- 34.5 kV Reactive power WTG Breaker F3-5
- Real power flowing through the T4 230 – 34.5 kV transformer
- Reactive power flowing through the T4 230 – 34.5 kV transformer
- 34.5 kV Real power WTG Breaker F4-1
- 34.5 kV Reactive power WTG Breaker F4-1
- 34.5 kV Real power WTG Breaker F4-2
- 34.5 kV Reactive power WTG Breaker F4-2
- 34.5 kV Real power WTG Breaker F4-3
- 34.5 kV Reactive power WTG Breaker F4-3
- 34.5 kV Real power WTG Breaker F4-4
- 34.5 kV Reactive power WTG Breaker F4-4
- 34.5 kV Real power WTG Breaker F4-5
- 34.5 kV Reactive power WTG Breaker F4-5
- Average Plant Wind Speed (MPH)
- Average Plant Atmospheric Pressure (Bar)
- Average Plant Temperature (Celsius)
- Max Gen Limit MW Set Point Feed Back
- Potential Power MW
- 230 kV A phase voltage
- 230 kV B phase voltage
- 230 kV C phase voltage

Analog Written to the RTU:

- Max Gen Limit MW Set Point

Status:

- 230 kV transformer T1 high side breaker
- 34.5 kV WTG breaker F1-1
- 34.5 kV WTG breaker F1-2
- 34.5 kV WTG breaker F1-3
- 34.5 kV WTG breaker F1-4
- 34.5 kV WTG breaker F1-5
- 34.5 kV WTG breaker F1-6
- 230 kV transformer T2 high side breaker
- 34.5 kV WTG breaker F2-1
- 34.5 kV WTG breaker F2-2
- 34.5 kV WTG breaker F2-3

- 34.5 kV WTG breaker F2-4
- 34.5 kV WTG breaker F2-5
- 230 kV transformer T3 high side breaker
- 34.5 kV WTG breaker F3-1
- 34.5 kV WTG breaker F3-2
- 34.5 kV WTG breaker F3-3
- 34.5 kV WTG breaker F3-4
- 34.5 kV WTG breaker F3-5
- 230 kV transformer T4 high side breaker
- 34.5 kV WTG breaker F4-1
- 34.5 kV WTG breaker F4-2
- 34.5 kV WTG breaker F4-3
- 34.5 kV WTG breaker F4-4
- 34.5 kV WTG breaker F4-5

Primary RTU acquiring serial data from the four primary meters at the collector substation:
Analogs:
- Generation MW
- Generator MVAr
- Energy Register kWh

Backup RTU acquiring serial data from the four backup meters at the collector substation:
Analogs:
- Generation MW
- Generator MVAr
- Energy Register kWh

From Aeolus Substation:
Net Metering Analogs:
- Net Generation MW
- Net Generator MVAr
- Energy Register kWh

Provide a controls interface for two new 230 kV breakers.

C1-48
Hard-wired signals to the Primary RTU at the collector substation:
Analogs:
- Real power flowing through the T1 230 – 34.5 kV transformer
- Reactive power flowing through the T1 230 – 34.5 kV transformer
- 34.5 kV Real power WTG Breaker 1 52-1
- 34.5 kV Reactive power WTG Breaker 1 52-1
- 34.5 kV Real power WTG Breaker 1 52-2
- 34.5 kV Reactive power WTG Breaker 1 52-2

- 34.5 kV Real power WTG Breaker 1 52-3
- 34.5 kV Reactive power WTG Breaker 1 52-3
- 34.5 kV Real power WTG Breaker 1 52-4
- 34.5 kV Reactive power WTG Breaker 1 52-4
- 34.5 kV Real power WTG Breaker 1 52-5
- 34.5 kV Reactive power WTG Breaker 1 52-5
- Real power flowing through the T2 230 – 34.5 kV transformer
- Reactive power flowing through the T2 230 – 34.5 kV transformer
- 34.5 kV Real power WTG Breaker 2 52-1
- 34.5 kV Reactive power WTG Breaker 2 52-1
- 34.5 kV Real power WTG Breaker 2 52-2
- 34.5 kV Reactive power WTG Breaker 2 52-2
- 34.5 kV Real power WTG Breaker 2 52-3
- 34.5 kV Reactive power WTG Breaker 2 52-3
- 34.5 kV Real power WTG Breaker 2 52-4
- 34.5 kV Reactive power WTG Breaker 2 52-4
- 34.5 kV Real power WTG Breaker 2 52-5
- 34.5 kV Reactive power WTG Breaker 2 52-5
- Real power flowing through the T3 230 – 34.5 kV transformer
- Reactive power flowing through the T3 230 – 34.5 kV transformer
- 34.5 kV Real power WTG Breaker 3 52-1
- 34.5 kV Reactive power WTG Breaker 3 52-1
- 34.5 kV Real power WTG Breaker 3 52-2
- 34.5 kV Reactive power WTG Breaker 3 52-2
- 34.5 kV Real power WTG Breaker 3 52-3
- 34.5 kV Reactive power WTG Breaker 3 52-3
- 34.5 kV Real power WTG Breaker 3 52-4
- 34.5 kV Reactive power WTG Breaker 3 52-4
- 34.5 kV Real power WTG Breaker 3 52-5
- 34.5 kV Reactive power WTG Breaker 3 52-5
- Real power flowing through the T4 230 – 34.5 kV transformer
- Reactive power flowing through the T4 230 – 34.5 kV transformer
- 34.5 kV Real power WTG Breaker 4 52-1
- 34.5 kV Reactive power WTG Breaker 4 52-1
- 34.5 kV Real power WTG Breaker 4 52-2
- 34.5 kV Reactive power WTG Breaker 4 52-2
- 34.5 kV Real power WTG Breaker 4 52-3
- 34.5 kV Reactive power WTG Breaker 4 52-3
- 34.5 kV Real power WTG Breaker 4 52-4
- 34.5 kV Reactive power WTG Breaker 4 52-4
- 34.5 kV Real power WTG Breaker 4 52-5
- 34.5 kV Reactive power WTG Breaker 4 52-5
- Average Plant Wind Speed (MPH)
- Average Plant Atmospheric Pressure (Bar)

- Average Plant Temperature (Celsius)
- Max Gen Limit MW Set Point Feed Back
- Potential Power MW
- 230 kV A phase voltage
- 230 kV B phase voltage
- 230 kV C phase voltage

Analog Written to the RTU:

- Max Gen Limit MW Set Point

Status:

- 230 kV transformer T1 high side breaker
- 34.5 kV WTG breaker 1 52-1
- 34.5 kV WTG breaker 1 52-2
- 34.5 kV WTG breaker 1 52-3
- 34.5 kV WTG breaker 1 52-4
- 34.5 kV WTG breaker 1 52-5
- 230 kV transformer T2 high side breaker
- 34.5 kV WTG breaker 2 52-1
- 34.5 kV WTG breaker 2 52-2
- 34.5 kV WTG breaker 2 52-3
- 34.5 kV WTG breaker 2 52-4
- 34.5 kV WTG breaker 2 52-5
- 230 kV transformer T3 high side breaker
- 34.5 kV WTG breaker 3 52-1
- 34.5 kV WTG breaker 3 52-2
- 34.5 kV WTG breaker 3 52-3
- 34.5 kV WTG breaker 3 52-4
- 34.5 kV WTG breaker 3 52-5
- 230 kV transformer T4 high side breaker
- 34.5 kV WTG breaker 4 52-1
- 34.5 kV WTG breaker 4 52-2
- 34.5 kV WTG breaker 4 52-3
- 34.5 kV WTG breaker 4 52-4
- 34.5 kV WTG breaker 4 52-5

Primary RTU acquiring serial data from the four primary meters at the collector substation:
Analogs:

- Generation MW
- Generator MVAr
- Energy Register kWh

Backup RTU acquiring serial data from the four backup meters at the collector substation:
Analogs:

- Generation MW
- Generator MVAr
- Energy Register kWh

From Bridger Substation:
Net Metering Analogs:

- Net Generation MW
- Net Generator MVAr
- Energy Register kWh

Provide a controls interface for one new 230 kV breaker.

C1-53
Hard-wired signals to the Primary RTU at the collector substation:
Analogs:

- Real power flowing through the T1 230 – 34.5 kV transformer
- Reactive power flowing through the T1 230 – 34.5 kV transformer
- 34.5 kV Real power WTG Breaker 1
- 34.5 kV Reactive power WTG Breaker 1
- Real power flowing through the T2 230 – 34.5 kV transformer
- Reactive power flowing through the T2 230 – 34.5 kV transformer
- 34.5 kV Real power WTG Breaker 2
- 34.5 kV Reactive power WTG Breaker 2
- Average Plant Wind Speed (MPH)
- Average Plant Atmospheric Pressure (Bar)
- Average Plant Temperature (Celsius)
- Max Gen Limit MW Set Point Feed Back
- Potential Power MW
- 230 kV A phase voltage
- 230 kV B phase voltage
- 230 kV C phase voltage

Analog Written to the RTU:

- Max Gen Limit MW Set Point

Status:

- 230 kV transformer T1 high side breaker
- 34.5 kV WTG breaker 1
- 230 kV transformer T2 high side breaker
- 34.5 kV WTG breaker 2

Primary RTU acquiring serial data from the two primary meters at the collector substation:
Analogs:

- Generation MW
- Generator MVAr

- Energy Register kWh

Backup RTU acquiring serial data from the two backup meters at the collector substation:
Analogs:
- Generation MW
- Generator MVAr
- Energy Register kWh

From Aeolus Substation:
Net Metering Analogs:
- Net Generation MW
- Net Generator MVAr
- Energy Register kWh

Provide a controls interface for two new 230 kV breaker

C1-55
Hard-wired signals to the Primary RTU at the collector substation:
Analogs:
- Real power flowing through the T1 230 – 34.5 kV transformer
- Reactive power flowing through the T1 230 – 34.5 kV transformer
- 34.5 kV Real power PV Breaker 1
- 34.5 kV Reactive power PV Breaker 1
- 34.5 kV Real power BSS Breaker 1
- 34.5 kV Reactive power BSS Breaker 1
- Real power flowing through the T2 230 – 34.5 kV transformer
- Reactive power flowing through the T2 230 – 34.5 kV transformer
- 34.5 kV Real power PV Breaker 2
- 34.5 kV Reactive power PV Breaker 2
- 34.5 kV Real power BSS Breaker 2
- 34.5 kV Reactive power BSS Breaker 2
- Global Horizontal Irradiance (GHI)
- Average Plant Atmospheric Pressure (Bar)
- Average Plant Temperature (Celsius)
- BESS current energy capacity (MWh)
- BESS current energy capacity (%)
- BESS cycles or health (cycle count or % health)
- Max Gen Limit MW Set Point Feed Back
- Potential Power MW
- 230 kV A phase voltage
- 230 kV B phase voltage
- 230 kV C phase voltage

Analog Written to the RTU:

- Max Gen Limit MW Set Point

Status:

- 230 kV transformer T1 high side breaker
- 34.5 kV PV breaker 1
- 34.5 kV BSS breaker 1
- 230 kV transformer T2 high side breaker
- 34.5 kV PV breaker 2
- 34.5 kV BSS breaker 2

Primary RTU acquiring serial data from the six primary meters at the collector substation:
Analogs:

- Generation MW
- Generator MVAr
- Energy Register kWh

Backup RTU acquiring serial data from the six backup meters at the collector substation:
Analogs:

- Generation MW
- Generator MVAr
- Energy Register kWh

From Platte Substation:
Net Metering Analogs:

- Net Generation MW
- Net Generator MVAr
- Energy Register kWh

Provide a controls interface for one new 230 kV breaker.

C1-57
Hard-wired signals to the Primary RTU at the collector substation:
Analogs:

- 34.5 kV Real power WTG Breaker 1
- 34.5 kV Reactive power WTG Breaker 1
- Average Plant Wind Speed (MPH)
- Average Plant Atmospheric Pressure (Bar)
- Average Plant Temperature (Celsius)
- Max Gen Limit MW Set Point Feed Back
- Potential Power MW
- 230 kV A phase voltage
- 230 kV B phase voltage
- 230 kV C phase voltage

Analog Written to the RTU:

- Max Gen Limit MW Set Point

Status:
- 230 kV transformer T1 high side breaker
- 34.5 kV WTG breaker 1

Primary RTU acquiring serial data from the one primary meters at the collector substation:
Analogs:
- Generation MW
- Generator MVAr
- Energy Register kWh

Backup RTU acquiring serial data from the one backup meters at the collector substation:
Analogs:
- Generation MW
- Generator MVAr
- Energy Register kWh

From Shirley Basin Substation:
Net Metering Analogs:
- Net Generation MW
- Net Generator MVAr
- Energy Register kWh

Provide a controls interface for one new 230 kV breaker

C1-59
Hard-wired signals to the Primary RTU at the collector substation:
Analogs:
- Real power flowing through the #1 230 – 34.5 kV transformer
- Reactive power flowing through the #1 230 – 34.5 kV transformer
- 34.5 kV Real power PV Breaker 1
- 34.5 kV Reactive power PV Breaker 1
- 34.5 kV Real power BSS Breaker 1
- 34.5 kV Reactive power BSS Breaker 1
- Global Horizontal Irradiance (GHI)
- Average Plant Atmospheric Pressure (Bar)
- Average Plant Temperature (Celsius)
- BESS current energy capacity (MWh)
- BESS current energy capacity (%)
- BESS cycles or health (cycle count or % health)
- Max Gen Limit MW Set Point Feed Back
- Potential Power MW
- 230 kV A phase voltage
- 230 kV B phase voltage

- 230 kV C phase voltage

Analog Written to the RTU:
- Max Gen Limit MW Set Point

Status:
- 230 kV transformer #1 high side breaker
- 34.5 kV transformer #1 high side breaker
- 34.5 kV PV Breaker 1
- 34.5 kV BSS Breaker 1

Primary RTU acquiring serial data from the two primary meters at the collector substation:
Analogs:
- Generation MW
- Generator MVAr
- Energy Register kWh

Backup RTU acquiring serial data from the two backup meters at the collector substation:
Analogs:
- Generation MW
- Generator MVAr
- Energy Register kWh

From Windstar Substation:
Net Metering Analogs:
- Net Generation MW
- Net Generator MVAr
- Energy Register kWh

Provide a controls interface for one new 230 kV breaker

7.7 Substation Requirements

The following major equipment has been preliminarily identified for the substations listed below and may change during actual design. Each substation listed is assumed to required expansion to provide sufficient space for the new equipment.

Aeolus Substation:
- 1 – 525kV/230kV transformer
- 3 – 550KV Breakers
- 7 – 525KV Horizontal Mount, Group Operated Switches
- 1 – 525KV Horizontal Mount, Group Operated Switches, w/ Ground Switch, w/Motor Operator
- 2 – 525KV Horizontal Mount, Group Operated Switches, w/Motor Operator
- 1 – 525kV Line Reactor
- 6 – 525kV Arresters
- 1 – 242 KV Breaker

- 2 – 230KV Horizontal Mount, group Operated Switches
- 1 – 230KV Vertical Mount, group Operated Switches
- 3 – 230kV VTs

Anticline Substation:

- 2 – 550KV Breakers
- 4 – 525KV Horizontal Mount, Group Operated Switches
- 1 – 525KV Horizontal Mount, Group Operated Switches, w/ Ground Switch, w/Motor Operator
- 2 – 525KV Horizontal Mount, Group Operated Switches, w/Motor Operator
- 1 – 525kV Line Reactor
- 6 – 525kV Arresters

Clover Substation:

- 1 – 550KV Breakers
- 2 – 525KV Horizontal Mount, Group Operated Switches
- 1 – 525KV Horizontal Mount, Group Operated Switches, w/ Ground Switch, w/Motor Operator
- 2 – 525KV Horizontal Mount, Group Operated Switches, w/Motor Operator
- 1 – 525kV Line Reactor
- 6 – 525kV Arresters

Coyote Substation:

- 2 – 550KV Breakers
- 1 – 525KV Horizontal Mount, Group Operated Switches
- 2 – 525KV Horizontal Mount, Group Operated Switches, w/ Ground Switch
- 4 – 525KV Horizontal Mount, Group Operated Switches, w/Motor Operator
- 2 – 525kV Line Reactor
- 1 – 525kV station service transformer
- 1 – 12’x12’ control house
- 6 – 525kV Arresters

Freezeout Substation:

- 2 – 242KV Breakers
- 4 – 230KV Horizontal Mount, Group Operated Switches
- 1 – 230KV Horizontal Mount, Group Operated Switches, w/ Ground Switch

Jim Bridger Substation:

- 5 – 242 KV, Breakers
- 10 – 230KV, Horizontal Mount, Group Operated Switches
- 3 – 230KV, Vertical Mount, Group Operated Switches, w/ Ground Switch
- 2 – 230kV CCVTs

Little Snake Substation:

- 2 – 550KV Breakers
- 2 – 525KV Horizontal Mount, Group Operated Switches

- 2 – 525KV Horizontal Mount, Group Operated Switches, w/ Ground Switch
- 4 – 525KV Horizontal Mount, Group Operated Switches, w/Motor Operator
- 2 – 525kV Line Reactor
- 1 – 525kV station service transformer
- 1 – 12'x12' control house
- 3 – 525kV CT/VT metering units

Monument Substation:
- 1 – 230/230kV phase shifting transformer
- 1 – 242 KV, Breakers
- 1 – 230KV, Horizontal Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches, w/Motor Operator

Shirley Basin Substation:
- 2 – 525/230kV Transformers
- 6 – 550KV Breakers
- 14- 525KV Horizontal Mount Group Operated Switches
- 2 – 525KV Horizontal Mount Group Operated Switches, W/ Motor Operator
- 1 – 525kV Line Reactor
- 1 – 525kV Cap Bank
- 1 – 27'x50' Control House
- 6 – 242 KV Breakers
- 11 – 230KV Horizontal Mount Group Operated Switches
- 3 – 230KV Vertical Mount Group Operated Switches
- 1 – 230kV CAP Bank

Standpipe Substation:
- 1 – 242 KV, Breakers
- 2 – 230KV, Horizontal Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches, w/Motor Operator

Windstar Substation:
- 2 – 242 KV Breakers
- 4 – 230KV Horizontal Mount Group Operated Switches
- 1 – 230KV Vertical Mount Group Operated Switch, w/Ground Switch

C1-02

The Interconnection Customer will provide a separate graded, grounded, and fenced area along the perimeter of the Interconnection Customer's collector substation for the Transmission Provider to install a control building for metering and communication equipment. This area will share a fence and ground grid with the Interconnection Customer collector substation and have separate, unencumbered access for the Transmission Provider. The Interconnection Customer shall perform and provide a CDEGS grounding analysis. AC service and DC power for the control building will be supplied by the Transmission Provider

Collector Site:

- 1 – 12'x12' Control Building
- 1 – Battery system
- 1 – 34.5kV station service transformer
- 3 – 46kV CT/VT combination metering units

Frannie Substation:

- 3 – 230kV CCVTs
- 3 – 46kV CCVTs

C1-03

The Interconnection Customer will provide a separate graded, grounded, and fenced area along the perimeter of the Interconnection Customer's collector substation for the Transmission Provider to install a control building for metering and communication equipment. This area will share a fence and ground grid with the Interconnection Customer collector substation and have separate, unencumbered access for the Transmission Provider. The Interconnection Customer shall perform and provide a CDEGS grounding analysis. AC service and DC power for the control building will be supplied by the Transmission Provider

Collector Site:

- 1 – 12'x12' Control Building
- 1 – Battery system
- 1 – 34.5kV station service transformer
- 3 – 46kV CT/VT combination metering units

Frannie Substation:

- 3 – 46kV CCVTs

C1-25

The Interconnection Customer will provide a separate graded, grounded, and fenced area along the perimeter of the Interconnection Customer's collector substation for the Transmission Provider to install a control building for control, metering and communication equipment. This area will share a fence and ground grid with the Interconnection Customer collector substation and have separate, unencumbered access for the Transmission Provider. The Interconnection Customer shall perform and provide a CDEGS grounding analysis. AC service and DC power for the control building will be supplied by the Transmission Provider

Collector Site:

- 1 – 12'x12' Control Building
- 1 – Battery system
- 1 – station service transformer
- 3 – 230kV CT/VT combination metering units

Aeolus Substation:

- 2 – 242 KV, Breakers
- 4 – 230KV, Horizontal Mount, Group Operated Switches
- 2 – 230KV, Vertical Mount, Group Operated Switches
- 2 – 230KV, Vertical Mount, Group Operated Switches, with motor operator

- 6 – 230kV CT/VT combination metering units

C1-35

The Interconnection Customer will provide a separate graded, grounded, and fenced area along the perimeter of the Interconnection Customer's collector substation for the Transmission Provider to install a control building for control, metering and communication equipment. This area will share a fence and ground grid with the Interconnection Customer collector substation and have separate, unencumbered access for the Transmission Provider. The Interconnection Customer shall perform and provide a CDEGS grounding analysis. AC service and DC power for the control building will be supplied by the Transmission Provider

Collector Site:

- 1 – 12'x12' Control Building
- 1 – Battery system
- 1 – station service transformer
- 12 – 230kV CT/VT combination metering units

Aeolus Substation:

- 2 – 242 KV, Breakers
- 4 – 230KV, Horizontal Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches, with motor operator
- 3 - 230kV CT/VT combination metering units

C1-48

The Interconnection Customer will provide a separate graded, grounded, and fenced area along the perimeter of the Interconnection Customer's collector substation for the Transmission Provider to install a control building for control, metering and communication equipment. This area will share a fence and ground grid with the Interconnection Customer collector substation and have separate, unencumbered access for the Transmission Provider. The Interconnection Customer shall perform and provide a CDEGS grounding analysis. AC service and DC power for the control building will be supplied by the Transmission Provider

Collector Site:

- 1 – 12'x12' Control Building
- 1 – Battery system
- 1 – station service transformer
- 12 – 230kV CT/VT combination metering units

Jim Bridger Substation:

- 1 – 242 KV, Breakers
- 2 – 230KV, Horizontal Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches
- 3 – 230KV, Vertical Mount, Group Operated Switches, with motor operator
- 3 - 230kV CT/VT combination metering units

C1-53

The Interconnection Customer will provide a separate graded, grounded, and fenced area along the perimeter of the Interconnection Customer's collector substation for the Transmission Provider to install a control building for control, metering and communication equipment. This area will share a fence and ground grid with the Interconnection Customer collector substation and have separate, unencumbered access for the Transmission Provider. The Interconnection Customer shall perform and provide a CDEGS grounding analysis. AC service and DC power for the control building will be supplied by the Transmission Provider

Collector Site:
- 1 – 12'x12' Control Building
- 1 – Battery system
- 1 – station service transformer
- 6 – 230kV CT/VT combination metering units

C1-55

The Interconnection Customer will provide a separate graded, grounded, and fenced area along the perimeter of the Interconnection Customer's collector substation for the Transmission Provider to install a control building for control, metering and communication equipment. This area will share a fence and ground grid with the Interconnection Customer collector substation and have separate, unencumbered access for the Transmission Provider. The Interconnection Customer shall perform and provide a CDEGS grounding analysis. AC service and DC power for the control building will be supplied by the Transmission Provider

Collector Site:
- 1 – 15'x30' Control Building
- 1 – Battery system
- 1 – station service transformer
- 18 – 230kV CT/VT combination metering units

Platte Substation:
- 1 – 242 KV, Breakers
- 2 – 230KV, Horizontal Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches, with motor operator
- 3 - 230kV CT/VT combination metering units

C1-57

The Interconnection Customer will provide a separate graded, grounded, and fenced area along the perimeter of the Interconnection Customer's collector substation for the Transmission Provider to install a control building for control, metering and communication equipment. This area will share a fence and ground grid with the Interconnection Customer collector substation and have separate, unencumbered access for the Transmission Provider. The Interconnection Customer shall perform and provide a CDEGS grounding analysis. AC service and DC power for the control building will be supplied by the Transmission Provider

Collector Site:
- 1 – 12'x12' Control Building
- 1 – Battery system

- 1 – station service transformer

Shirley Basin Substation:
- 1 – 242 KV, Breakers
- 2 – 230KV, Horizontal Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches, with motor operator
- 3 - 230kV CT/VT combination metering units

C1-59

The Interconnection Customer will provide a separate graded, grounded, and fenced area along the perimeter of the Interconnection Customer's collector substation for the Transmission Provider to install a control building for control, metering and communication equipment. This area will share a fence and ground grid with the Interconnection Customer collector substation and have separate, unencumbered access for the Transmission Provider. The Interconnection Customer shall perform and provide a CDEGS grounding analysis. AC service and DC power for the control building will be supplied by the Transmission Provider

Collector Site:
- 1 – 12'x12' Control Building
- 1 – Battery system
- 1 – station service transformer

Windstar Substation:
- 1 – 242 KV, Breakers
- 1 – 230KV, Horizontal Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches
- 1 – 230KV, Vertical Mount, Group Operated Switches, with motor operator
- 3 - 230kV CT/VT combination metering units

7.8 Communication Requirements

Aeolus –Clover 500 kV Transmission Line

OPGW will need to be run between Clover, Coyote, Little Snake, and Aeolus substations. Each location will require optical transport equipment to be installed at each location for signal regeneration.

Anticline-Shirley Basin 500 kV Transmission Line

OPGW will need to be run between Shirley Basin, Aeolus and Anticline substations. Each location will require optical transport equipment to be installed at each location for signal regeneration.

Freezeout-Standpipe 500 kV Transmission Line

OPGW will need to be run between Freezeout and Standpipe substations. Each location will require optical transport equipment to be installed at each location for signal regeneration.

Shirley Basin-Windstar 500 kV Transmission Line

OPGW will need to be run between Shirley Basin and Windstar substations. Each location will require optical transport equipment to be installed at each location for signal regeneration.

C1-02

The Transmission Provider will install fiber optic cable between the Point of Interconnection to the Frannie substation. Communications equipment will be installed at both locations. The Interconnection Customer will install Transmission Provider provided fiber to its recloser.

C1-03

The Transmission Provider will install fiber optic cable between the Point of Interconnection to the Frannie substation. Communications equipment will be installed at both locations. The Interconnection Customer will install Transmission Provider provided fiber to its recloser.

C1-25

The Interconnection Customer shall install Transmission Provider approved fiber optic cable on each of its tie lines between its collector substation and Aeolus substation to provide redundant protective relaying paths as well as to meet SCADA and metering data requirements. The paths must maintain Transmission Provider clearance standards. The Transmission Provider shall own and maintain the fiber therefore the Interconnection Customer shall provide the Transmission Provider the necessary easements for the fiber installation. The fiber shall be terminated in the Transmission Provider control buildings at both sites. The Interconnection Customer will hardwire its source devices to a Transmission Provider RTU in the collector substation control building.

C1-35

The Interconnection Customer shall install two runs of Transmission Provider approved fiber optic cable on its tie line between its collector substation and Aeolus substation to provide redundant protective relaying paths as well as to meet SCADA and metering data requirements. The Transmission Provider assumes the Interconnection Customer will install structures capable of meeting the clearance standards between the two fibers. The Transmission Provider shall own and maintain the fiber therefore the Interconnection Customer shall provide the Transmission Provider the necessary easements for the fiber installation. The fiber shall be terminated in the Transmission Provider control buildings at both sites. The Interconnection Customer will hardwire its source devices to a Transmission Provider RTU in the collector substation control building.

Should the Interconnection Customer be unable to install two runs of fiber between the collector and POI substation the Transmission Provider assumes it will install a microwave system at both sites to develop the second path.

C1-48

The Interconnection Customer shall install two runs of Transmission Provider approved fiber optic cable on its tie line between its collector substation and Bridger substation to provide redundant protective relaying paths as well as to meet SCADA and metering data requirements. The Transmission Provider assumes the Interconnection Customer will install structures capable of meeting the clearance standards between the two fibers. The Transmission Provider shall own and maintain the fiber therefore the Interconnection Customer shall provide the Transmission Provider the necessary easements for the fiber installation. The fiber shall be terminated in the Transmission Provider control buildings at both sites. The Interconnection Customer will hardwire its source devices to a Transmission Provider RTU in the collector substation control building.

Should the Interconnection Customer be unable to install two runs of fiber between the collector and POI substation the Transmission Provider assumes it will install a microwave system at both sites to develop the second path.

C1-53

The Transmission Provider assumes the Interconnection Customer will utilize the communications equipment proposed to be installed as part of higher priority Interconnection Request Q0836. The Interconnection Customer will hardwire its source devices to a Transmission Provider RTU in the collector substation control building. The new infrastructure shall be tied into the Q0836 communications network back to Aeolus substation.

C1-55

The Interconnection Customer shall install two runs of Transmission Provider approved fiber optic cable on its tie line between its collector substation and Platte substation to provide redundant protective relaying paths as well as to meet SCADA and metering data requirements. The Transmission Provider assumes the Interconnection Customer will install structures capable of meeting the clearance standards between the two fibers. The Transmission Provider shall own and maintain the fiber therefore the Interconnection Customer shall provide the Transmission Provider the necessary easements for the fiber installation. The fiber shall be terminated in the Transmission Provider control buildings at both sites. The Interconnection Customer will hardwire its source devices to a Transmission Provider RTU in the collector substation control building.

Should the Interconnection Customer be unable to install two runs of fiber between the collector and POI substation the Transmission Provider assumes it will install a microwave system at both sites to develop the second path.

C1-57

The Interconnection Customer shall install two runs of Transmission Provider approved fiber optic cable on its tie line between its collector substation and Shirley Basin substation to provide redundant protective relaying paths as well as to meet SCADA and metering data requirements. The Transmission Provider assumes the Interconnection Customer will install structures capable of meeting the clearance standards between the two fibers. The Transmission Provider shall own and maintain the fiber therefore the Interconnection Customer shall provide the Transmission Provider the necessary easements for the fiber installation. The fiber shall be terminated in the Transmission Provider control buildings at both sites. The Interconnection Customer will hardwire its source devices to a Transmission Provider RTU in the collector substation control building.

Should the Interconnection Customer be unable to install two runs of fiber between the collector and POI substation the Transmission Provider assumes it will install a microwave system at both sites to develop the second path.

C1-59

The Interconnection Customer shall install two runs of Transmission Provider approved fiber optic cable on its tie line between its collector substation and Windstar substation to provide redundant protective relaying paths as well as to meet SCADA and metering data requirements. The Transmission Provider assumes the Interconnection Customer will install structures capable of meeting the clearance standards between the two fibers. The Transmission Provider shall own and maintain the fiber therefore the Interconnection Customer shall provide the Transmission Provider the necessary easements for the fiber installation. The fiber shall be terminated in the Transmission Provider control buildings at both sites. The Interconnection Customer will hardwire its source devices to a Transmission Provider RTU in the collector substation control building.

Should the Interconnection Customer be unable to install two runs of fiber between the collector and POI substation the Transmission Provider assumes it will install a microwave system at both sites to develop the second path.

7.9 Metering Requirements

Upgrade the Jim Bridger 230 kV bus to breaker and half scheme

This upgrade will require the metering on the Point of Rocks and Rock Springs line to be reworked as needed to support the changes. Existing equipment should largely remain adequate.

New 500 kV line between Aeolus – Clover

This upgrade will require a new metering point at Little Snake to act as revenue and state line metering. This will require one metering point. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panel, junction box, and secondary metering wire. The primary metering transformers will be combination 525kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters with DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

A direct serial connection is required for retail sales and generation accounting via the MV-90 translation system.

C1-02

<u>Interchange Metering</u>

The overall project metering will be located at the Point of Interconnection at the Interconnection Customer's facility and rated for the total net generation of the Project. This will require one metering point. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panel, junction box, and secondary metering wire. The primary metering transformers will be combination 34.5kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters with DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

An Ethernet connection is required for retail sales and generation accounting via the MV-90 translation system.

Station Service/Construction Power
The Project is within the Transmission Provider's service territory. Please note that prior to back feed, Interconnection Customer must arrange transmission retail meter service for electricity consumed by the Project that will be drawn from the transmission system when the Project is not generating. Interconnection Customer must call the Help Desk at 1-800-625-6078 to arrange this service. Approval for back feed is contingent upon obtaining station service.

C1-03

Interchange Metering
The overall project metering will be located at the Point of Interconnection at the Interconnection Customer's facility and rated for the total net generation of the Project. This will require one metering point. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panel, junction box, and secondary metering wire. The primary metering transformers will be combination 34.5kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters with DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

An Ethernet connection is required for retail sales and generation accounting via the MV-90 translation system.

Station Service/Construction Power
The Project is within the Transmission Provider's service territory. Please note that prior to back feed, Interconnection Customer must arrange transmission retail meter service for electricity consumed by the Project that will be drawn from the transmission system when the Project is not generating. Interconnection Customer must call the Help Desk at 1-800-625-6078 to arrange this service. Approval for back feed is contingent upon obtaining station service.

C1-25

Interchange Metering
The overall project metering will be located at the Point of Interconnection at Aeolus substation and rated for the total net generation of the Project. This will require two metering points. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panels, junction boxes, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters with DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

A direct serial connection is required for retail sales and generation accounting via the MV-90 translation system.

GSU Metering
The GSU metering will be located at the Interconnection Customer's collector substation and rated for the size of each individual transformer. This will require three metering points. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panels, junction boxes, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters for each metering point. The meters will output DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

An Ethernet connection is required for retail sales and generation accounting via the MV-90 translation system.

Station Service/Construction Power
Prior to construction, Interconnection Customer must arrange construction power with the Transmission Provider holding the certificated service territory rights for the area in which the load is physically located.

Please note, prior to back feed, Interconnection Customer must arrange retail meter service for electricity consumed by the Project when not generating.

C1-35
Interchange Metering
The overall project metering will be located at the Point of Interconnection at Aeolus substation and rated for the total net generation of the Project. This will require one metering point. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panel, junction box, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters with DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

A direct serial connection is required for retail sales and generation accounting via the MV-90 translation system.

GSU Metering

The GSU metering will be located at the Interconnection Customer's collector substation and rated for the size of each individual transformer. This will require four metering points. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panels, junction boxes, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters for each metering point. The meters will output DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

An Ethernet connection is required for retail sales and generation accounting via the MV-90 translation system.

Station Service/Construction Power

Prior to construction, Interconnection Customer must arrange construction power with the Transmission Provider holding the certificated service territory rights for the area in which the load is physically located.

Please note, prior to back feed, Interconnection Customer must arrange retail meter service for electricity consumed by the Project when not generating.

C1-48

Interchange Metering

The overall project metering will be located at the Point of Interconnection at Jim Bridger substation and rated for the total net generation of the Project. This will require one metering point. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panel, junction box, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters with DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

A direct serial connection is required for retail sales and generation accounting via the MV-90 translation system.

GSU Metering

The GSU metering will be located at the Interconnection Customer's collector substation and rated for the size of each individual transformer. This will require four metering points. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panels, junction boxes, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters for each metering point. The meters will output DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

An Ethernet connection is required for retail sales and generation accounting via the MV-90 translation system.

Station Service/Construction Power

The Project is within the Transmission Provider's service territory. Please note that prior to back feed, Interconnection Customer must arrange transmission retail meter service for electricity consumed by the Project that will be drawn from the transmission system when the Project is not generating. Interconnection Customer must call the Help Desk at 1-800-625-6078 to arrange this service. Approval for back feed is contingent upon obtaining station service.

C1-53

Interchange Metering

The overall project metering will be located at the Point of Interconnection at Aeolus substation and rated for the total net generation of the Project. This will require one metering point. This metering point is expected to be shared with the Q0836 project. Therefore, the existing meters and meter panel should remain adequate. The primary metering transformers should also remain adequate, provided they were specified with a large enough CT ratio. However, this will be reevaluated if C1-53 goes forward.

GSU Metering

The GSU metering will be located at the Interconnection Customer's collector substation and rated for the size of each individual transformer. This will require two metering points. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panels, junction boxes, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters for each metering point. The meters will output DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

An Ethernet connection is required for retail sales and generation accounting via the MV-90 translation system.

Station Service/Construction Power

Prior to construction, Interconnection Customer must arrange construction power with the Transmission Provider holding the certificated service territory rights for the area in which the load is physically located.

Please note, prior to back feed, Interconnection Customer must arrange retail meter service for electricity consumed by the Project when not generating.

C1-55

Interchange Metering

The overall project metering will be located at the Point of Interconnection at Platte substation and rated for the total net generation of the Project. This will require one metering point. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panel, junction box, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters with DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

An Ethernet connection is required for retail sales and generation accounting via the MV-90 translation system.

GSU Metering

The GSU metering will be located at the Interconnection Customer's collector substation and rated for the size of each individual transformer. This will require two metering points. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panels, junction boxes, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters for each metering point. The meters will output DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

An Ethernet connection is required for retail sales and generation accounting via the MV-90 translation system.

Generation Metering

The metering to separate solar and battery activity will be located at the Interconnection Customer's collector substation and rated for the capacity of each string. This will require four metering points. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panels, junction boxes, and secondary metering wire. The primary metering transformers will be combination 34.5kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters for each metering point. The meters will output DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

An Ethernet connection is required for retail sales and generation accounting via the MV-90 translation system.

Station Service/Construction Power
The Project is within the Transmission Provider's service territory. Please note that prior to back feed, Interconnection Customer must arrange transmission retail meter service for electricity consumed by the Project that will be drawn from the transmission system when the Project is not generating. Interconnection Customer must call the Help Desk at 1-800-625-6078 to arrange this service. Approval for back feed is contingent upon obtaining station service.

C1-57

Interchange Metering
The overall project metering will be located at the Point of Interconnection at Shirley Basin substation and rated for the total net generation of the Project. This will require one metering point. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panel, junction box, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters with DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

A direct serial connection is required for retail sales and generation accounting via the MV-90 translation system.

Station Service/Construction Power
Prior to construction, Interconnection Customer must arrange construction power with the Transmission Provider holding the certificated service territory rights for the area in which the load is physically located. This appears to be High Plains Power.

Please note, prior to back feed, Interconnection Customer must arrange retail meter service for electricity consumed by the Project when not generating.

C1-59

Interchange Metering
The overall project metering will be located at the Point of Interconnect at Windstar substation and rated for the total net generation of the Project. This will require one metering point. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, meters, meter panel, junction box, and secondary metering wire. The primary metering transformers will be combination 230kV CT/VT units with extended range CTs for high-accuracy metering.

The metering design package will include two revenue quality meters with DNP real time digital data terminated at a metering interposition block. One meter will be designated as primary SCADA meter with DNP data delivered to the primary control center. A second meter will be designated as backup SCADA meter with DNP data delivered to the alternate control center. The metering data will include bidirectional KWH and KVARH revenue quantities. The meter data will also include instantaneous PF, MW, MVAR, MVA, per-phase voltage, and per-phase amps data.

A direct serial connection is required for retail sales and generation accounting via the MV-90 translation system.

Generation Metering

The solar and battery activity is required to be metered separately. Metering for this purpose will be located at the Interconnection Customer's collector substation on the DC side of each inverter. Separate metering will be required for each individual battery resource and each individual solar resource. The metering will be rated for the capacity of each source. The Transmission Provider will specify and order all interconnection revenue metering, including the current and voltage sensors/converters, meters, meter enclosures, and secondary metering wire.

The project calls for 138 inverters, with battery and solar attached at the DC side of each inverter. This will require 276 metering points to measure battery and solar separately. For meters measuring generation, the Transmission Provider requires primary and backup meters at each point. Therefore, this project is expected to require 552 DC meters.

The metering design package will include two revenue quality meters at each metering point with real time digital data to the Transmission providers SCADA system. One meter will be designated as primary SCADA meter with data delivered to the primary control center. A second meter will be designated as backup SCADA meter with data delivered to the alternate control center. The metering data will include bidirectional KWH revenue quantities. The meter data will also include instantaneous MW, voltage, and amps data.

A communication connection is required for retail sales and generation accounting via the MV-90 translation system.

Station Service/Construction Power

The Project is within the Transmission Provider's service territory. Please note that prior to back feed, Interconnection Customer must arrange transmission retail meter service for electricity consumed by the Project that will be drawn from the transmission system when the Project is not generating. Interconnection Customer must call the Help Desk at 1-800-625-6078 to arrange this service. Approval for back feed is contingent upon obtaining station service.

8.0 Contingent Facilities (ERIS)

Contingent Facilities Table							
Potential Contingent Facility Description	Outage(s)	Pre-Cluster Overload/ Violation Level	Post-Cluster Overload / Violation Level	% Change	Contingent Facility (Yes/No)	Responsible Entity	Planned ISD
Gateway South and the ancillary improvements	Aeolus – Anticline 500 kV line with the Aeolus RAS dropping 627 MW	Non-conver-gence	Non-conver-gence	N/A	Yes	PAC	*Estimated* December 2024
An upgrade of the existing Jim Bridger 345/230 kV #2 transformer to 700 MVA	Loss of Jim Bridger #1 and # 3 345/230 kV auto transformer.	141%	191%	35%	Yes	PAC	*Estimated* September 2021
A new 230 kV transmission line between Aeolus and Freezeout substations	Aeolus – Freezeout 230 kV line with the RAS to drop generation at Freezeout	100%	126%	26%	Yes	Q835	*Estimated December 2024*
Gateway West Segment D3 and its ancillary improvements	Aeolus – Clover 500 kV line with the Aeolus RAS dropping 627 MW	101%	Doesn't Solve	N/A	Yes	PAC	TBD

9.0 Cost Estimate (ERIS)

The following estimate represents only scopes of work that will be performed by the Transmission Provider. Costs for any work being performed by the Interconnection Customer and/or Affected Systems are not included.

9.1 Interconnection Facilities

The following facilities are directly assigned to Interconnection Customer(s) using such facilities. If multiple Interconnection Requests are utilizing the same Transmission Provider Interconnection Facilities, the costs shall be shared pursuant to Section 39.2.3 of Transmission Provider's OATT.

C1-02

C1-02 Collector Substation $520,000

Control house, communications, and metering equipment

C1-03

C1-03 Collector Substation *Control house, communications, and metering equipment*	$520,000
<u>C1-25</u>	
C1-25 Collector Substation *Control house, relaying, communications, and metering equipment*	$1,270,000
Aeolus Substation *Line termination and metering*	$1,910,000
<u>C1-35</u>	
C1-35 Collector Substation *Control house, relaying, communications, and metering equipment*	$1,210,000
Aeolus Substation *Line termination and metering*	$750,000
<u>C1-48</u>	
C1-48 Collector Substation *Control house, relaying, communications, and metering equipment*	$1,200,000
Bridger Substation *Line termination and metering*	$960,000
<u>C1-53</u>	
C1-53 Collector Substation *Control house, relaying, communications, and metering equipment*	$930,000
Aeolus Substation *Relay settings*	$50,000
<u>C1-55</u>	
C1-55 Collector Substation *Control house, relaying, communications, and metering equipment*	$1,450,000
Platte Substation *Line termination and metering*	$960,000
<u>C1-57</u>	
C1-57 Collector Substation *Control house, relaying, communications, and metering equipment*	$660,000
Shirley Basin Substation *Line termination and metering*	$960,000
<u>C1-59</u>	

C1-59 Collector Substation $5,130,000
Control house, relaying, communications, and metering equipment

Windstar Substation $960,000
Line termination and metering

9.2 Station Equipment

The following are Network Upgrades which are allocated based on the number of Generating Facilities interconnecting at an individual station on a per Interconnection Request basis. Interconnection Requests utilizing the same Interconnection Facilities shall be consider one request for this allocation.

C1-02
Frannie Substation $730,000
230 kV and 46 kV CCVTs and panels, communications equipment

C1-03
Frannie Substation $730,000
46 kV CCVTs and panel, communications equipment

C1-25
Aeolus Substation $1,677,000
New bay, two line positions, relaying equipment

C1-35
Aeolus Substation $1,677,000
New bay, two line positions, relaying equipment

C1-48
Bridger Substation $860,000
Line position

C1-53
Aeolus Substation $1,677,000
New bay, two line positions, relaying equipment

C1-55
Platte Substation $860,000
Line position

C1-57
Shirley Basin Substation $910,000
Line position

C1-59
Windstar Substation $650,000
Line position

9.3 Network Upgrades

The funding responsibility for Network Upgrades other than those identified in the previous section shall be allocated based on the proportional capacity of each individual Generating Facility.

Shirley Basin Substation $72,600,000
New 500kV substation with 230kV breaker bay

Anticline Substation $10,400,000
500kV line position, breaker and line shunt reactor

Latham Area Substation $54,520,000
500kV series capacitor substation

Aeolus Substation $55,870,000
500kV breaker bay, transformer, reactor, 230kV line position and breaker

Little Snake Substation $69,100,000
500kV series capacitor substation and reactors

Coyote Substation $68,690,000
500kV series capacitor substation and reactors

Clover Substation $10,740,000
500kV line position, breaker and reactor

Freezout Substation $3,690,000
Expand substation and new 230kV breaker bay

Standpipe Substation $1,380,000
Line position and 230kV breaker

Windstar Substation $3,730,000
Expand substation and new 230kV breaker bay

Monument Substation $15,740,000
Expand substation and install 230kV phase shifting transformer

Jim Bridger Substation $34,650,000
New yard with 230kV bays and breakers, 700MVA transformer

Riverton Substation $210,000
Line loss panel

Mustang Substation $210,000

Line loss panel

Shirley Basin-Anticline 500kV line $347,310,000
170-mile 500kV transmission line

Aeolus-Clover 500kV line $939,760,000
416-mile 500kV transmission line

Freezeout-Standpipe 230kV line $14,700,000
12-mile 230kV transmission line

Windstar-Shirley Basin 230kV line $62,400,000
59-mile 230kV transmission line

Clover-Nebo 138kV line $4,560,000
Rebuild 5.5-miles of 138kV transmission line

Network Upgrade Total: $1,770,260,000

9.4 Total Estimated Project Costs

C1-02

Interconnection Facilities	$520,000
Station Equipment	$730,000
Total:	**$1,250,000**

C1-03

Interconnection Facilities	$520,000
Station Equipment	$730,000
Total:	**$1,250,000**

C1-25

Interconnection Facilities	$3,180,000
Station Equipment	$1,677,000
Network Upgrades	$571,256,000
Total:	**$576,113,000**

C1-35

Interconnection Facilities	$1,960,000
Station Equipment	$1,677,000
Network Upgrades	$317,365,000
Total:	**$321,001,000**

C1-48

Interconnection Facilities	$2,160,000

Station Equipment	$860,000
Network Upgrades	$380,838,000
	Total: $383,858,000

C1-53

Interconnection Facilities	$980,000
Station Equipment	$1,677,000
Network Upgrades	$120,599,000
	Total: $123,255,000

C1-55

Interconnection Facilities	$2,410,000
Station Equipment	$860,000
Network Upgrades	$126,311,000
	Total: $129,581,000

C1-57

Interconnection Facilities	$1,620,000
Station Equipment	$910,000
Network Upgrades	$63,473,000
	Total: $66,003,000

C1-59

Interconnection Facilities	$6,090,000
Station Equipment	$650,000
Network Upgrades	$190,419,000
	Total: $197,159,000

10.0 Schedule (ERIS)

The Transmission Provider estimates it will require approximately 72 months to design, procure and construct the facilities described in this report following the execution of Interconnection Agreements. The schedule will be further developed and optimized during the Facilities Studies.

11.0 Transmission Provider System Requirements - NRIS

11.1 Transmission System Requirements

No additional requirements in addition to those identified for ERIS.

12.0 Affected Systems

Transmission Provider has identified the following affected systems: Big Horn REA, Flathead REA, WAPA, Tri State, Idaho Power Company, Basin Electric and Black Hills.

A copy of this report will be shared with each Affected System.

13.0 APPENDICES

Appendix 1: Cluster Area Power Flow and Stability Study Results
Appendix 2: Higher Priority Requests
Appendix 3: Property Requirements

13.1 Appendix 1: Cluster Area Power Flow and Stability Study Results

The Western Electricity Coordinating Council (WECC) approved 2020 Heavy Summer case was used to perform the power flow studies using PSS/E version 34.8. The 2020 Heavy Summer case was modified for the study year, 2025. The local 500 kV, 345 kV, 230 kV and 115 kV transmission system outages were considered during the study.

The case was studied considering prior generator interconnection queue projects with signed interconnection agreements and prior queued and granted transmission service requests. Major system improvements identified in the assumptions section of this report were modeled, regardless of in-service date, as well as any improvements related to prior generation queue projects.

The following planned capital projects were assumed in-service:

(1) The Energy Gateway South and ancillary improvements associated with the project (in-service date 12/2024).
(2) Upgrade the Jim Bridger #2 345 230 kV auto transformer (in-service date 09/2021)
(3) Gateway West Segment D.1 and Segment D.3

For the cluster study, TPL category P1, P2 and P7 contingencies were simulated. A significant number of outages within the cluster area along with outages on the neighboring clusters were considered and the system performance was monitored before and after each contingency.

The generation interconnection projects in CA1 need to ensure that they meet the power factor range of 0.95 leading to 0.95 lagging. It is the responsibility of the Interconnection Customer to ensure that the power factor requirement is met.

The power flow study demonstrated that interconnecting 2818 MW of generation in the East Wyoming bubble without any additional transmission results in an unsolved case. Several mitigations were tried to determine the solution that would result in a solved case with 2818 MW of new generation interconnected in CA-1. Two different mitigation were tried independently. These mitigations were:

(a) A new 170 mile long series compensated 500 kV line from Shirley Basin – Anticline 500 kV line and ancillary improvements; or
(b) A new 416 mile long series compensated 500 kV line from Aeolus – Clover 500 kV line

Both mitigations (a) and (b) independently did not completely resolved all the issues for N-0 and N-1 and hence both mitigations (a) and (b) were applied together and further analysis was run to determine any local transmission issues that needs to be mitigated. The following local issues were observed in addition to the mitigations described above

(1) The study demonstrated that with significant amounts of power being transferred to Clover, a system normal overload is being observed in the Clover area which will need mitigation in order for the generators to interconnect. The Clover Tap – Nebo 138 kV line, which is approximately 5.5 miles in length, will need to be rebuilt with 1272 ACSR conductor.
(2) The loss of the existing Standpipe – Freezeout 230 kV line result in the overload of the entire 230 kV system from Platte – Latham – Echo Springs - Bar X– Bitter Creek – Point of Rocks. This will require building of a new 230 kV line approximately 12 miles between Freezeout – Standpipe with a bundled 2x1272 ACSR Bittern conductor.

(3) The study showed that the loss of Amasa – Heward – Shirley Basin 230 kV line resulted in the thermal overload of the Windstar – Shirley Basin #1 230 kV line (D.1) due to resources from the Dave Johnston/ Windstar area being transmitted towards Aeolus. This will require building a new approximately 59-mile 230 kV line between Windstar and Shirley Basin with a bundled 2x1272 ACSR Bittern conductor.

(4) The loss of the Aeolus – Anticline 500 kV line with the Aeolus RAS results in the thermal overload of the single 500/230 kV auto transformer at Shirley Basin and hence a second 500/230 kV auto transformer 1600/1792 MVA (continuous/emergency) will be required at Shirley Basin.

(5) The study showed that the loss of a single Monument phase shifter results in thermal overload of the parallel phase shifter with heavy flows pushing on the 230 kV transmission system, requiring a third phase shifter at Monument 300/325 MVA (continuous/ emergency).

(6) There were several outages that resulted in the thermal overload of the Jim Bridger #1 and #3 345/230 kV auto transformers. These transformers will need to be replaced with a single 700/784 MVA (continuous/ emergency) transformer along with rebuilding of the 230 kV bus at Jim Bridger to an eleven (11) breaker, breaker and a half scheme.

(7) The study also demonstrated some high voltage issues for certain outages that will require automatic protection for the shunt capacitor banks at Mustang and Riverton.

The table below shows the results of the analysis:

Outage Category	Outage	Overloaded Element/ Voltage Issue Bus	Overload above Rate C (%)/ Voltage magnitude (PU)	Mitigation
With No Additional Mitigation				
P0	N/A	The case doesn't solve 2800 MW of new resources in Wyoming	N/A	(1) A new Shirley Basin - Anticline 500 kV line with triple bundle 3x1272 ACSR Bittern conductor (Approximately 170 miles) * Same specification as the Aeolus - Anticline 500 kV line. (2)A new 500/230 kV auto trasformer at Shirley Basin 1600/1792 MVA (Continuous/Emergency) (3) A 200 MVAR shunt capacitor banks at Shirley Basin 500 kV substation (4) A new 500/230 kV auto transformer at Aeolus 1600/1792 MVA (Continuous/ Emergency)
With new Shirley Basin - Anticline 500 kV line				
P0	N/A	Bonanza - Mona 345 kV line	106%	Build a second Aeolus - Clover 500 kV line with triple bundle 3x1272 ACSR Bittern conductor
P0	N/A	Blacksfork - West Vaco - Raven 230 kV line	102%	
P0	N/A	Bridger - Threemile Knoll 345 kV line	104%	
P0	N/A	Carbon - Spanish Fork # 1 138 kV line	102%	
P0	N/A	Populus 500 kV series capacitor bank (Anticline - Populus 500 kV line)	102%	
P0	N/A	Little Snake series capacitor bank (Gateway South line north series compensation station)	114%	
P0	N/A	Coyote series capacitor bank (Gateway South line south series compensation station)	111%	
With new Aeolus - Clover # 2 500 kV line				
P1	Aeolus - Anticline 500 kV line with Aeolus RAS	The case doesn't solve	N/A	A new Shirley Basin - Anticlien 500 kV line with triple bundle 3x1272 ACSR Bittern conductor (Approximately 170 miles)

Results continued on next page

Outage Category	Outage	Overloaded Element/ Voltage Issue Bus	Overload above Rate C (%)/ Voltage magnitude (PU)	Mitigation
With both Shirley Basin - Anticline 500 kV line and new Aeolus - Clover # 2 500 kV line				
P0	N/A	Clover T1 - Nebo 138 kV line	105	Rebuild approximately 5.5 miles of 138 kV line with a 1272 ACSR conductor.
P1	Freezeout - Standpipe 230 kV line	Bar-X - Bitter Creek 230 kV line	109.00	Construct a second Freezeout - Standpipe 230 kV line with a bundled 2x1272 ACSR Bittern conductor (12 miles)
		Bar-X - Echo Springs 230 kV line	111.00	
		Platte - Latham 230 kV line	113.00	
		Point of Rocks - Bitter Creek 230 kV line	105.00	
		Bridger 345/230 kV #1 &#3 auto transformers	131.00	
		Latham - Echo Springs 230 kV line	118.00	
P2-3	Loss of the Aeolus - Freezeout # 2 230 kV line and Freezeout - Standpipe 230 kV line due to breaker failure at Freezeout	Bar-X - Bitter Creek 230 kV line	110.00	
		Bar-X - Echo Springs 230 kV line	111.00	
		Platte - Latham 230 kV line	113.00	
		Point of Rocks - Bitter Creek 230 kV line	106.00	
		Latham - Echo Springs 230 kV line	118.00	
P1	Amasa - Heward - Shirley Basin 230 kV line	Windstar - Shirley Basin #1 230 kV line	103.00	Construct a second Windstar - Shirley Basin 230 kV line with a bundled 2x1272 ACSR Bittern conductor (59 miles)
P2-3	Loss of the Shirley Basin - Aeolus # 1 230 kV line and Shirley Basin - Heward - Amasa 230 kV line due to breaker fault (CB1421) at Shirley Basin	Windstar - Shirley Basin #1 230 kV line	101.00	
P1	Aeolus - Anticline 500 kV line with Aeolus RAS	Shirley Basin 500/230 kV #1 auto transformer	102.00	Install a new second 500/230 kV auto trasformer at Shirley Basin 1600/1792 MVA (Continuous/Emergency)
P1	Monument 230/230 kV #1 phase shifting transformer	Monument 230/230 #2 phase shifting transformer	122.00	Install a thrid Monument PST
P1	Monument 230/230 kV #2 phase shifting transformer	Monument 230/230 #1 phase shifting transformer	122.00	
P1	Aeolus - Anticline 500 kV line with Aeolus RAS	Bridger 345/230 kV #1 &#3 auto transformers	104.0000	Replace the existing 345/230 kV #1 and # 3 auto transformer with a single 700 MVA 345/230 kV auto transformer and convert the Jim Bridger 230 kV bus to a breaker and half bus due to its ampacity constraints.
	Shirley Basin - Anticline 500 kV line with Aeolus RAS		101.0000	
	Raven - West Vaco - Blacksfork - Monument 230 kV		102.0000	
	Bridger 345/230 kV # 2 auto transformer		120.0000	
P2-2	Loss of both Monument 230/230 kV phase shifters	Bridger 345/230 kV #1 &#3 auto transformers	129.0000	
P2-3	Loss of both Rock Springs - Firehole 230 kV Line and Rock Springs - Raven 230 kV line due to internal breaker fault (1H132) at Rock Springs	Bridger 345/230 kV #1 &#3 auto transformers	151.0000	
P2-3	Loss of both Rock Spring - Raven 230 kV line and Rock Springs - Point of Rocks 230 kV line due to internal breaker fault (1H128) at Rock Springs	Bridger 345/230 kV #1 &#3 auto transformers	105.0000	
P7	Simultaneous loss of both Populus - Ben Lomond 345 kV line + Populus - Bridgerland 345 kV line	Bridger 345/230 kV #1 &#3 auto transformers	109.0000	

Results continued on next page

Outage Category	Outage	Overloaded Element/ Voltage Issue Bus	Overload above Rate C (%)/ Voltage magnitude (PU)	Mitigation
P1	Atlantic - Rock Springs 230 kV line	ATLANTIC 230 kV	1.1475	Install automatic protection at Riverton to trip the appropriate amount of shunt capacitors for voltages above 1.1 PU
		RIVERTON 230 kV	1.1200	
		WYOPO 230 kV	1.1300	
		HS_GEN08 230 kV	1.1117	
		COL GEN 230 kV	1.1475	
		PILOT BU 115 kV	1.1056	
		RIVERTON 115 kV	1.1252	
		WINDRIVR 115 kV	1.1213	
		WINDRIVT 115 kV	1.1213	
P2-3	Atlantic - Rock Springs 230 kV line + Rock Springs - Bridger 230 kV line due to breaker (1H144) fault at Rock Springs	ATLANTIC 230 kV	1.1480	Install automatic protection at Riverton to trip the appropriate amount of shunt capacitors for voltages above 1.1 PU
		RIVERTON 230 kV	1.1194	
		WYOPO 230 kV	1.1314	
		HS_GEN08 230 kV	1.1122	
		COL GEN 230 kV	1.1480	
		PILOT BU 115 kV	1.1060	
		RIVERTON 115 kV	1.1256	
		WINDRIVR 115 kV	1.1218	
		WINDRIVT 115 kV	1.1218	
P1	TC-06 POI - Mustang 230 kV Line	Bairoil 115 kV	1.1358	Install automatic protection at Mustang to trip the appropriate amount of shunt capacitors for voltages above 1.1 PU
		GREAT Divide 115 kV	1.1420	
		Mustang 230 kV	1.1405	
		Mustang 115 kV	1.1424	
		Whiskey Peak 115 kV	1.1343	

13.2 Appendix 2: Higher Priority Requests

All active higher priority Transmission Provider projects, and transmission service and/or generator interconnection requests will be considered in this cluster area study and are identified below. If any of these requests are withdrawn, the Transmission Provider reserves the right to restudy this request, as the results and conclusions contained within this study could significantly change.

Transmission/Generation Interconnection Queue Requests considered:

Q0409 (320 MW)
Q0713 (350 MW)
Q0719 (280 MW)
Q0783 (30 MW)
Q0784 (80 MW)
Q0785 (100 MW)
Q0789 (74.9 MW)
Q0801 (80 MW)
Q0802 (50 MW)
Q0807 (75.9 MW)
Q0835 (190 MW)
Q0836 (400 MW)
TSR Q2594 (500 MW)
TCS-06 (80 MW)

13.3 Appendix 3: Property Requirements

Property Requirements for Point of Interconnection Substation

Requirements for rights of way easements

Rights of way easements will be acquired by the Interconnection Customer in the Transmission Provider's name for the construction, reconstruction, operation, maintenance, repair, replacement and removal of Transmission Provider's Interconnection Facilities that will be owned and operated by Transmission Provider. Interconnection Customer will acquire all necessary permits for the Project and will obtain rights of way easements for the Project on Transmission Provider's easement form.

Real Property Requirements for Point of Interconnection Substation

Real property for a POI substation will be acquired by an Interconnection Customer to accommodate the Interconnection Customer's Project. The real property must be acceptable to Transmission Provider. Interconnection Customer will acquire fee ownership for interconnection substation unless Transmission Provider determines that other than fee ownership is acceptable; however, the form and instrument of such rights will be at Transmission Provider's sole discretion. Any land rights that Interconnection Customer is planning to retain as part of a fee property conveyance will be identified in advance to Transmission Provider and are subject to the Transmission Provider's approval.

The Interconnection Customer must obtain all permits required by all relevant jurisdictions for the planned use including but not limited to conditional use permits, Certificates of Public Convenience and Necessity, California Environmental Quality Act, as well as all construction permits for the Project.

If eligible, Interconnection Customer will not be reimbursed through network upgrades for more than the market value of the property.

As a minimum, real property must be environmentally, physically, and operationally acceptable to Transmission Provider. The real property shall be a permitted or able to be permitted use in all zoning districts. The Interconnection Customer shall provide Transmission Provider with a title report and shall transfer property without any material defects of title or other encumbrances that are not acceptable to Transmission Provider. Property lines shall be surveyed and show all encumbrances, encroachments, and roads.

Examples of potentially unacceptable environmental, physical, or operational conditions could include but are not limited to:

1. Environmental: known contamination of site; evidence of environmental contamination by any dangerous, hazardous or toxic materials as defined by any governmental agency; violation of building, health, safety, environmental, fire, land use, zoning or other such regulation; violation of ordinances or statutes of any governmental entities having jurisdiction over the property; underground or above ground storage tanks in area; known remediation sites on property; ongoing mitigation activities or monitoring activities; asbestos; lead-based paint, etc. A phase I environmental study is required for land being acquired in fee by the Transmission Provider unless waived by Transmission Provider.

2. Physical: inadequate site drainage; proximity to flood zone; erosion issues; wetland overlays; threatened and endangered species; archeological or culturally sensitive areas; inadequate sub-surface elements, etc.

Transmission Provider may require Interconnection Customer to procure various studies and surveys as determined necessary by Transmission Provider.

Operational: inadequate access for Transmission Provider’s equipment and vehicles; existing structures on land that require removal prior to building of substation; ongoing maintenance for landscaping or extensive landscape requirements; ongoing homeowner's or other requirements or restrictions (e.g., Covenants, Codes and Restrictions, deed restrictions, etc.) on property which are not acceptable to the Transmission Provider.