Facilities Study For Southwest Power Pool (SPP)

DISIS 2022-001
Group 5
GEN-2022-147

Xcel Energy Services, Inc.

Southwestern Public Service Co.
Transmission Planning South
Updated 11/11/2025

Executive Summary

The Southwest Power Pool (SPP or Transmission Provider [TP]) evaluated the generation facilities requesting to interconnect to the SPS transmission system in the Definitive Interconnection System Impact Study (DISIS-2022-001), which was completed in October, 2025. The requests for interconnection were placed with SPP in accordance with the Scope of Interconnection Facilities Study GIP Section 8.10 and the Interconnection Facilities Study Procedures in accordance with GIP Section 8.11.

GEN-2022-147 requested the interconnection of a 203 MW thermal energy generation facility, located in Hale County, Texas, to the Southwestern Public Service Company (SPS or Transmission Owner [TO]) transmission network. SPS will expand the TUCO 345 kV substation to provide a Point-Of-Interconnection (POI) for GEN-2022-147. After substation construction is complete, the Interconnection Customer (IC) will connect to the TUCO 345 kV bus. The IC will be required to maintain a Power Factor between 0.95 lagging and 0.95 leading at the POI.

The customer will refer to other requirements that may be needed at the following link: Salesforce **(Xcel Energy Interconnection Guidelines For Transmission Interconnected Producer-Owned Generation Greater Than 20 MW).**

Coordination with Xcel Energy is required during the under-frequency relay-setting phase for the generation. The IC is required to report their generation off-nominal frequency tripping relay settings to SPP and SPS. SPS specifies that generators shall not trip at frequencies above 58.5 Hz unless exceptions in the Transmission Provider Criteria are met. The IC agrees that the energy generating units installed at this interconnection will not be tripped for under-frequency conditions above 58.5 Hz in compliance with Transmission Provider criteria. This means that the generation subject to this Interconnection Agreement may not trip for under-frequency conditions on the transmission system until all under-frequency load shedding relays have operated. SPS will also require that the IC follow all applicable criteria, guidelines, standards, requirements, regulations, and procedures issued by the North American Electric Reliability Corporation (NERC), SPP, and the Federal Energy Regulatory Commission (FERC) or their successor organizations.

The IC is responsible for all the cost of the Interconnection Facilities, installation of the direct assigned Transmission Owner Interconnection Facilities (TOIF) which are facilities paid for by the IC but are owned, operated, and maintained by SPS; inclusive of all construction required for the IC to interconnect at SPS' TUCO Substation.

The shared network upgrades were determined by SPP and will impact the total overall costs for interconnection of the IC.

It is anticipated that the entire process of constructing the TUCO Substation for the acceptance of the IC facility output and the network upgrades allocated to this project will require approximately 30 months to complete after an Interconnection Agreement is signed and an authorization to proceed is received. The IC's cost for the interconnection of this generation facility is shown below in Table 1.

Table 1: Cost Summary[1]

Shared Network Upgrades Total [See SPP Report(s) UID 170713]:	**$ 19,200,000**
Non-shared Network Upgrades:	**$ 4,128,699**
Transmission Owner Interconnection Facilities:	**$ 2,252,015**
Total:	**$ 25,580,714**

[1] The cost estimates are 2025 dollars with an accuracy level of ±20%.

General Description of SPS[2] Facilities

1. **Construction at the SPS TUCO Substation**: See Appendix A, Figure A-1 for general vicinity location map of the SPS facility.

   Location: The IC will build one 345 kV generation tie-line from their generation facility to SPS' 345 kV TUCO Substation, in Hale County, New Mexico. SPS requires the IC to run dual OPGW conductors from their generation facility to provide redundant communication. The customer will terminate their generation tie-line to transmission terminal structures installed and owned by SPS. The transmission terminal structures will be located outside of the TUCO Substation. SPS will install transmission jumpers at the transmission terminal structure and phase conductors along with fiber optics cable to the Point-Of-Interconnection terminal inside the TUCO Substation. The transmission terminal structure will provide a clear change-of-ownership point for the IC.

   Bus Design: The 345 kV breaker and one-half configuration at TUCO Substation will be expanded to accommodate the POI for the GEN-2022-147 thermal generation facility.

   Revenue Metering: An individual billing meter will be installed at the SPS substation on the line terminal from the IC's substation, which meets the standards: ANSI C12.1 accuracy class 0.2 (3-PT's IEEE C57.13 accuracy class 0.3 and 3-CT's IEEE C57.13 accuracy class 0.15) for full 3-phase 4-wire metering. Pulses out of the billing meter will be sent via SCADA to the Transmission Owner's Control Center in Amarillo, Texas.

   Disturbance Monitoring Device: A Disturbance Fault Recorder (DFR), capable of recording faults, swings, and long-term trending, will be installed to monitor and record conditions in the substation and on the transmission lines. The disturbance equipment shall also be equipped with a GPS time synching clock. This equipment will have communication capability with a dedicated communication circuit. The disturbance equipment will have its own dedicated communications circuit.

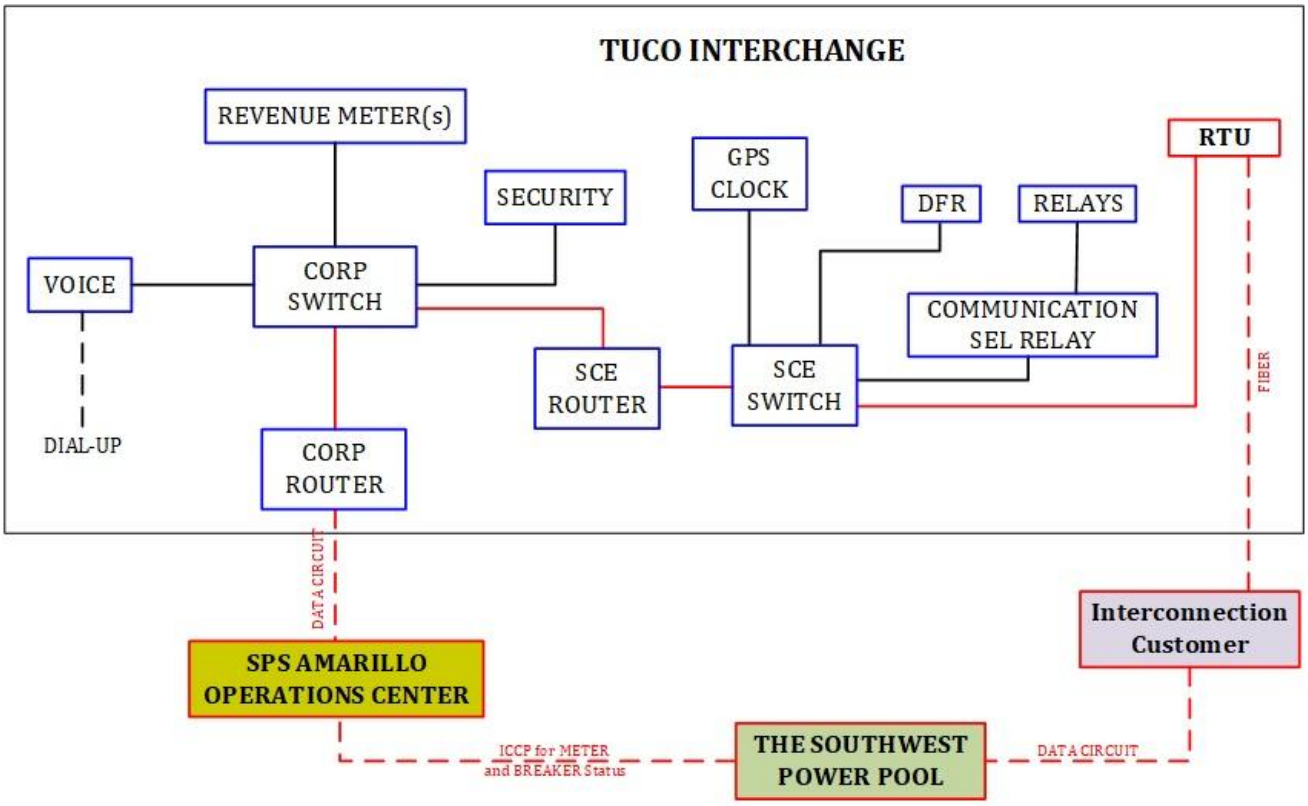
   Remote Terminal Unit (RTU): A RTU will be utilized for communications with the new IC facilities. A Communication SEL Relay will be utilized for relay communications and other functions as required; these costs will be directly assigned to the IC. The IC will provide and install a RTU for metering and telemetry at the IC's facility as required by the latest Xcel Energy Interconnection Guidelines.

   Communications: To meet its Communications obligations, the IC shall be responsible for planning with the local phone company to provide a communication circuit as required by the Transmission Owner. Transmission Owner equipment may include but is not limited to the following: relay communication equipment, RTU, and disturbance monitoring equipment. Prior to any construction, the IC is required to contact the Transmission Owner substation-engineering department for all communication details and provide detail of the method to be used in communication.

   The following communications schematic diagram, which includes communication equipment information for the IC, Transmission Provider (Southwest Power Pool) and Transmission Owner (Southwestern Public Service), is provided to assist the Parties as a template.

   A schematic outlining the proposed communications is provided below:

[2] All modifications to SPS facilities will be owned, maintained, and operated by SPS.



IC shall be responsible for providing the dual fiber optic communication circuit installed in the overhead transmission line static wire from the customer substation to the SPS substation for protective relaying and for transmitting metering and status data to SPS. Utilizing this fiber optic connection, SPS will establish a direct connection to the IC's RTU.

SPS will not serve as a proxy for communication from the IC to SPP.

2. **Transmission and Remote Substation Work – Engineering and Construction**

   a. **Coordination**: The Xcel Energy Transmission Engineering and Design groups require an engineering review of the customer's design prior to any construction by the IC or its contractor on any customer transmission lines, the proposed termination to the SPS substation, or doing work in close proximity to any SPS transmission line. It is the IC's responsibility to initiate the design review in a timely manner before construction of any transmission line begins. If the review has not been made or the design at any of the aforementioned locations is deemed inadequate, the crossing(s) and or termination into the interchange will be delayed until the matters are resolved. SPS will not be held responsible for these delays

   b. **Fault or Short Circuit Study**: The IC will coordinate with the System Protection Engineering department at SPS on the available fault current at the interconnection location following the acceptance of the Generator Interconnection Agreement (GIA) and prior to final design on the IC's facilities. The table below shows the approximate available fault current at the interconnection location. The fault data does not contain fault current contribution from the IC's facility.

Table 1: Available fault current at interconnection location

Short Circuit Information without contribution from new Generator Facilities (GEN 2022-147)				
Fault Location	Fault Current (Amps)		Impedance (Ω)	
	Line-to-Ground	3–Phase	Z^+	Z^0
TUCO 345 kV Bus	4566.52	12254.1	16.2178 j1.09360	11.0277 j0.61146

3. **Right-Of-Way**

   a. **Permitting**: The IC will be responsible for any permitting and right of way of their substation and their generation tie-line from their collector substation to TUCO Substation. The customer will refer to the Xcel Energy *Right-of-Way, Easements, and Encroachments* web page for information concerning crossing of SPS transmission lines with customer generation tie-lines: *Right of Way | Transmission | Corporate | Xcel Energy*

4. **Construction Power and Retail Service**

   a. **Responsibility**: It is the sole responsibility of the IC to arrange for both construction and station power. The IC needs to plan for retail service from the local retail provider. The retail provider and the Customer will be responsible for making any necessary transmission service arrangements as required under the SPP OATT.

5. **Project and Operating Concerns:**

   a. **Collaboration**: Close work between the Transmission group, the IC's personnel and local operating groups will be imperative in order to meet any in-service date that has been established.

   b. **Reactive Power Requirements**: The IC will be required to maintain a power factor between 0.95 lagging and a 0.95 leading at the Point of Interconnection (POI). All capacitors required will be installed on the lower voltage bus at IC's substation. This is required to maintain acceptable dynamic voltage rise as per latest revision of the Xcel Energy Interconnection Guidelines for Transmission Interconnection Producer-Owned Generation Greater than 20 MW. If switched reactive devices are used on the IC's system, they need to be switched in stages where the voltage rise is less than 3%.

6. **Estimated Construction Costs and Schedule**
   a. **Schedule**: An engineering and construction schedule for this project is estimated at approximately 30 months. Other factors associated with clearances, equipment delays, and work schedules could cause additional delays. This is applicable after all required agreements are signed and internal approvals are granted.

   b. All additional cost for work not identified in this study is the sole responsibility of the IC unless other arrangements are made.

Appendix A

Figure A-1: General vicinity location map of the generation facility

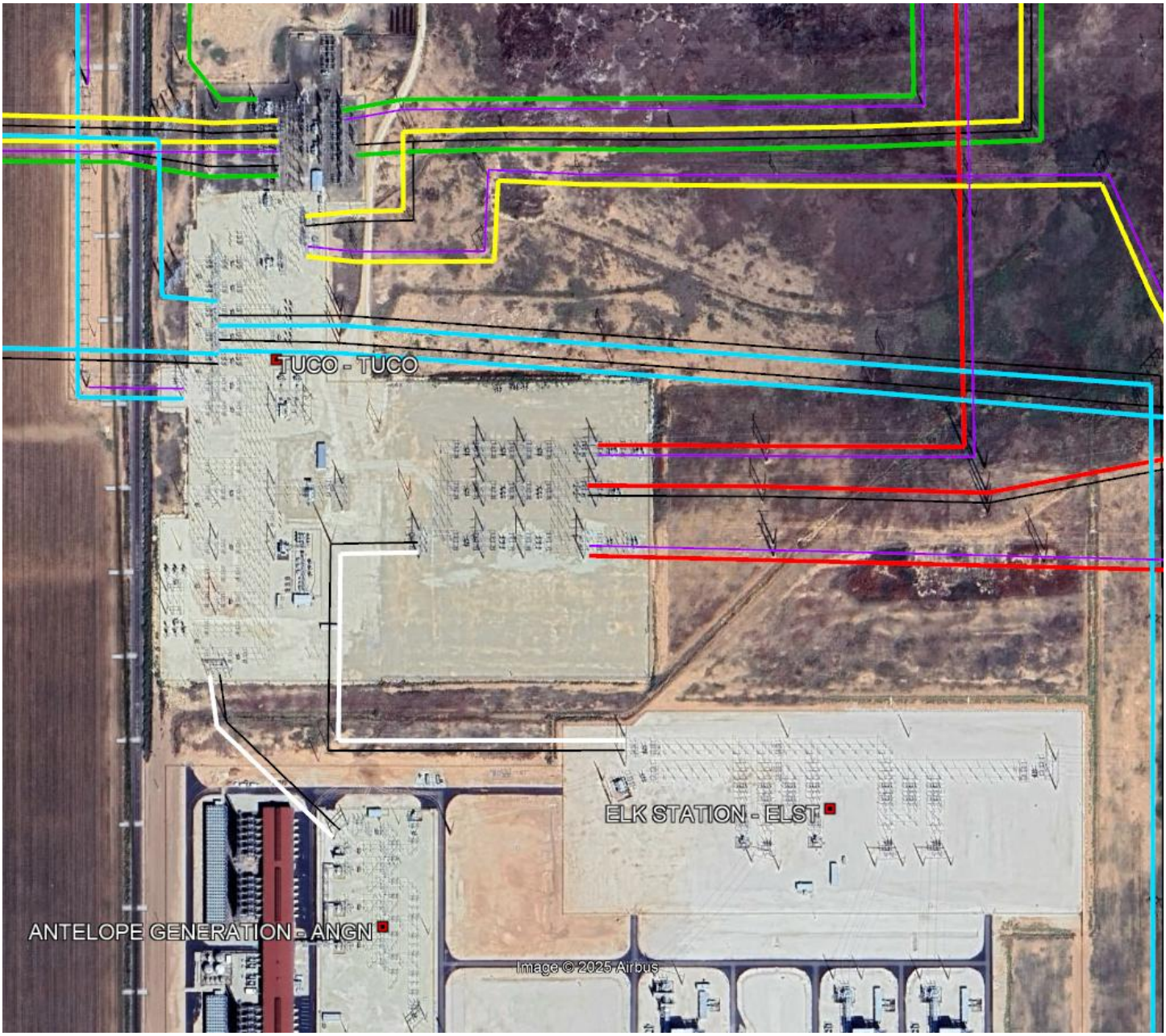
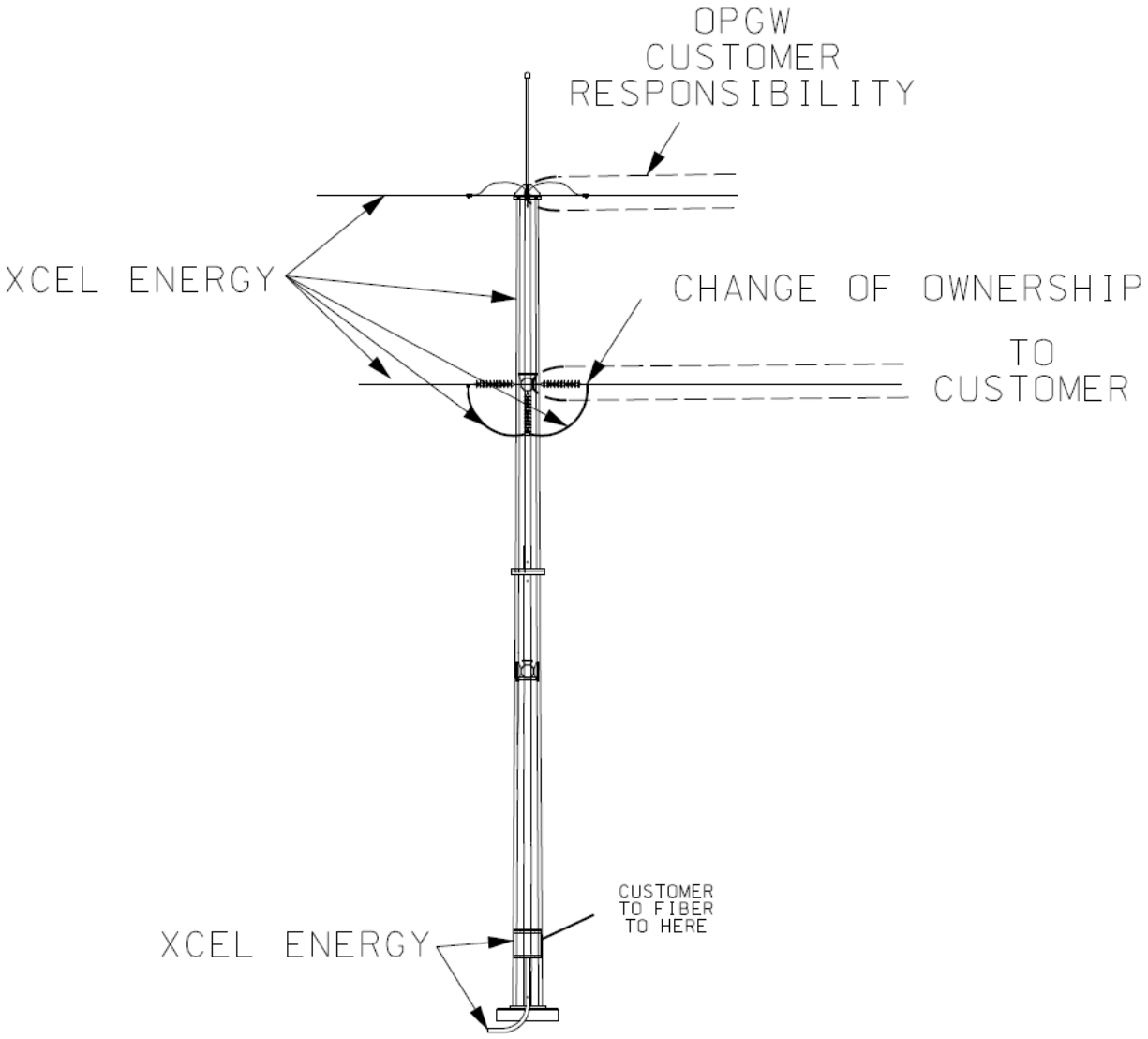


Figure A-2: Transmission Terminal Structure & Change of Ownership

DIAGRAMS ARE NOT FOR CONSTRUCTION PURPOSES



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