SPP Southwest Power Pool

Facility Study For Generation Interconnection Request GEN-2010-006

SPP Tariff Studies

(GEN-2010-006)

February 2011

SPP Summary

Xcel Energy Inc. (Xcel) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2010-006. The interconnection of the 205 MW generation facility located in Lubbock County, Texas is in the control area of the Southwestern Public Service Company (SPS) transmission network. SPS is a New Mexico Corporation and wholly owned subsidiary of Xcel Energy Inc. The request for interconnection was placed with SPP in accordance with SPP's Open Access Transmission Tariff, which covers new generation interconnections on SPP's transmission system.

Interconnection Customer Interconnection Facilities

The Interconnection Customer will be responsible for the 230 kV transmission line from its generator facility substation to the Point of Interconnection (POI), the existing Jones 230 kV Interchange near Lubbock, TX.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

Per the following Facility Study, the Interconnection Customer is responsible for **$1,408,514** of Transmission Owner Interconnection Facilities and non-shared network upgrades.

Shared Network Upgrades

The interconnection customer was studied within the DISIS-2010-001 Impact Study. At this time, the Interconnection Customer is allocated **$0** of shared network upgrades. If higher queued interconnection customers withdraw from the queue, suspend or terminate their GIA, restudies will have to be conducted to determine the Interconnection Customers' allocation of shared network upgrades. All studies have been conducted on the basis of higher queued interconnection requests and the upgrades associated with those higher queued interconnection requests being placed in service.

Facilities Study For
Southwest Power Pool (SPP)

205 MW Generation Facilities
Lubbock County, Texas
SPP #GEN-2010-006

November 2, 2010

Xcel Energy Services, Inc.
Transmission Planning

Executive Summary

Xcel Energy's Energy Supply ("Interconnection Customer") in 2010 requested the interconnection of a new generation facility located in Lubbock County, Texas to the Southwestern Public Service Company (SPS) transmission network. SPS is a New Mexico Corporation and wholly owned subsidiary of Xcel Energy Inc. This facility has a net capacity of 205 MW. The Interconnection Customer's facility will connect to the existing SPS Jones Interchange 230 kV located approximately 4 miles southeast of Lubbock, Texas. The Interconnection Customer's expected commercial operation date and back-feed date is June 30, 2011 and April 1, 2011, respectively.

The Southwest Power Pool (SPP) evaluated the request to interconnect the generator facility to the SPS transmission system in a System Impact Study (SIS) GEN-2010-006 completed in July 2010.The interconnection request was studied using one (1) Siemens Gas Generator for a total output of 205 MW. The Interconnection Customer will be required to maintain a Power Factor of 0.95 lagging and 0.95 leading at the Point of Interconnection (POI) based on SPP's SIS Table shown on page 16.

SPS requires that all construction for this request be in compliance with the latest revision of the Xcel Energy Interconnection Guidelines for Transmission Interconnection Producer-Owned Generation Greater than 20 MW, available at:
http://www.xcelenergy.com/Texas/Company/Transmission/Pages/Transmission_Services_Interconnection_Guidelines.aspx). This document describes the requirements for connecting new generation to the Xcel Energy transmission systems including technical, protection, commissioning, operation, and maintenance. SPS will also require that the Interconnection Customer be in compliance with all applicable criteria, guidelines, standards, requirements, regulations, and procedures issued by the North American Electric Reliability Corporation (NERC), Southwest Power Pool (SPP), and the Federal Energy Regulatory Commission (FERC) or their successor organizations.

The Interconnection Customer is responsible for the cost of the Interconnection Facilities, installation of the Direct Assigned Interconnection Facilities; inclusive of all construction required for the 230 kV transmission line from the Interconnection Customer's substation to the SPS Jones Interchange.

As for this request (GEN-2010-006), it is anticipated that the entire process of adding the new 230 kV line terminal at Jones Interchange for the acceptance of the Jones Generator Unit #3 facility output, will require approximately 6 months to complete after an Interconnection Agreement is signed and an authorization to proceed is received. The cost of these upgrades, inclusive of the Interconnection Customer's cost for the interconnection of this Gas Generator facility, is shown below in Table 1, with the detailed description of the cost shown in Table 3.

Table 1, Cost Summary[a]

`Network Upgrades:	$ 1,178,514
Transmission Owner Interconnection Facilities:	$ 230,000
Total:	**$ 1,408,514**

[a] The cost estimates are 2010 dollars with an accuracy level of ±20%.

General Description of SPS[b] Facilities

1. **Construction of New Line Terminal:** See Appendix A, Figure A- 1 for general vicinity location map.

    1.1. **Location:** SPS will add a new 230 kV line terminal at the existing SPS Jones Interchange. Appendix A, Figure A- 2, shows a one-line of the new breaker configuration at Jones Interchange, Figure A-3 shows a typical elevation view of the Point of Interconnection (POI).

    1.2. **Bus Design:** The initial interconnection shall be to the existing main and transfer bus at Jones Interchange to accommodate the outputs from the new Gas Generator facility. This is shown in Appendix A, Figure A-2. (The final bus design for the interconnection shall be breaker and half to be constructed at Jones Interchange.)

    1.3. **Line Terminals:** The 230kV lines and static wire terminals will be designed to accommodate 2,000 pounds per phase conductor at maximum tension, with a maximum 15-degree pull off from normal.

    1.4. **Control House:** The existing control house will accommodate the new metering, protective relaying and control devices, terminal cabinets, and any fiber-optic cable terminations, etc. for the new 230 kV line breaker terminal.

    1.5. **Security Fence**: The existing security fence shall be extended if required when the new bay is added for the new 230 kV line terminal.

    1.6. **Ground Grid**: The existing ground grid shall be extended to accommodate the additional bay required for the new line terminal per ANSI/IEEE STD 80-1986, with our standard 4/0 copper ground mesh on 40-foot centers with ground rods and 20-foot centers in corners and loop outside of fence.

    1.7. **Site Grading**: Company contractor, per company specifications, will perform any site grading and erosion control to accommodate the new line terminal. Soil compaction shall be not less than 95% of laboratory density as determined by ASTM-D-698.

    1.8. **Station Power**: The existing station power, provided from the local distribution system, will be utilized.

    1.9. **Relay and Protection Scheme**: The new 230 kV breaker line terminal primary protection to the interconnection customer 230 kV transmission line will use line current differential relaying over optical fiber installed in the static of the customer's 230 kV transmission line. Secondary relaying will use mirrored bit, Permissive Overreaching Transfer Trip (POTT) over the optical fiber. An SEL 311L and an SEL 421 will be used as primary and secondary relays, respectively. No automatic re-closing scheme will be used. The SEL 421 will be used for line/bus SCADA closing conditions for the 230 kV breaker. Also, a SEL 501-0 will be used for breaker failure.

    An SEL DTA-2 will display the bus voltage, GCB amps, MW, MVAR, and fault location. A communication relay will be installed and for other functions as required.

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

1.10. **Revenue Metering:** On the proposed SPS Jones Interchange 230 kV line terminal to the Interconnection Customer's substation, an individual billing meter will be installed, 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. Also installed for the metering units will be 3-PT's and 3-CT's for full 3-phase 4-wire metering. There will be one meter per line terminal with full 4 quadrant metering. Pulses out of the primary billing meter will be sent via SCADA to the Transmission Owner's Control Center in Amarillo, Texas.

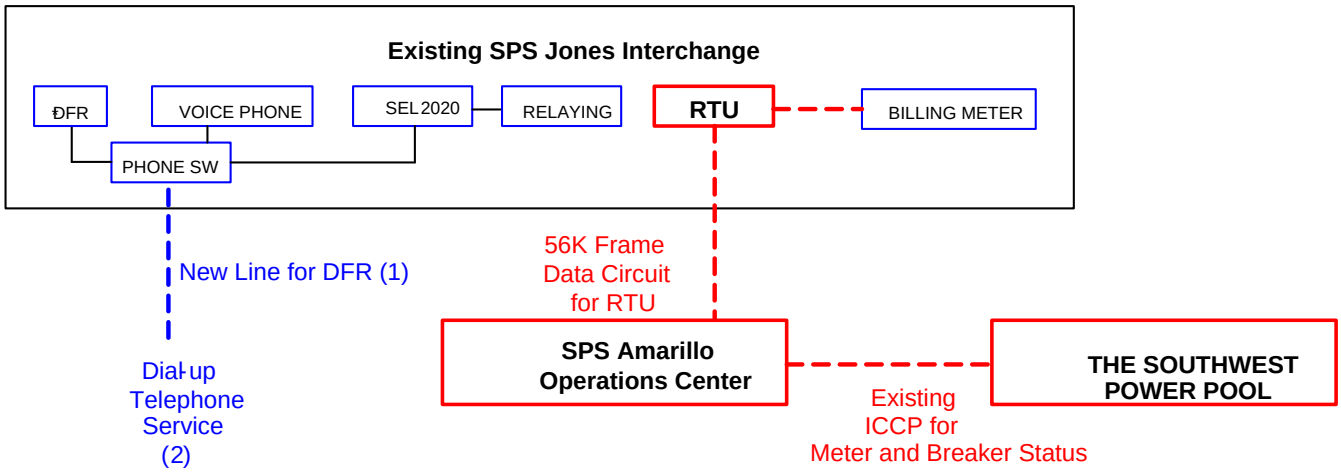
1.11. **Disturbance Monitoring Device:** Disturbance-monitoring equipment (DFR), capable of recording faults, swings, and long term trending, will be installed to monitor and record conditions in the substation and on the transmission lines. The disturbance equipment shall also be equipped with a GPS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

1.12. **Remote Terminal Unit (RTU):** An existing RTU will be utilized to accommodate for the new 230 kV line terminal at Jones Interchange. SPS will provide and install if needed additional RTU cards for metering and telemetry as required by the latest Xcel Energy Interconnection Guidelines. The direct cost will be charged to the Interconnection Customer.

1.13. **Communications:** To meet its Communications obligations under Article 8 of this GIA, the Interconnection Customer shall be responsible for making arrangements with the local phone company to provide telephone circuits 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 at the new Switching Station. Prior to any construction, the Interconnection Customer is required to contact the Transmission Owner substation-engineering department for all communication details.

Pursuant to Article 8.1 of this GIA, the Interconnection Customer shall provide the dedicated data circuit(s) necessary to provide Interconnection Customer data to Transmission Owner as set forth in Appendix D of this GIA. The Interconnection Customer and Transmission Owner shall cooperate reasonably to ensure that all Parties comply with the terms, recommendations, and standards in Appendix D of this GIA. The following communications schematic diagram, which includes communication equipment information for the Interconnection Customer, Transmission Provider (Southwest Power Pool) and Transmission Owner (Southwestern Public Service), is provided to assist the Parties in meeting the standards set forth in Appendix D of the GIA.

A schematic outlining the proposed communications is provided below:



To facilitate its compliance with Appendix D of the GIA, Interconnection Customer shall be responsible for providing fiber optic communication circuit installed in the overhead transmission line static wire for protective relaying from the customer substation to Jones Station.

2. **Transmission Work:**

2.1. The Interconnection Customer will construct, own, operate, and maintain any customer owned 230 kV transmission line from the Interconnection Customer's substation to the Interconnection Point at SPS Jones Interchange. This line is shown in Appendix A, Figure A-1 and is estimated to be 200 feet. **The SPS transmission design group prior to any construction by the Interconnection Customer or its contractor on any customer 230 kV transmission lines, or doing work in close proximity to any SPS transmission line, will require an engineering review of the customer's design. It is the Interconnection Customer'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.**

3. **Right-Of-Way:**

3.1. **Permitting**: Permitting for the construction of a new 230 kV line terminal at Jones Interchange is not required from the Public Utility Commission in the State of Texas. The interconnection customer will be responsible for any permitting and right of way of their substation and the 230 kV transmission line from their substation to the Interconnection Point at Jones Interchange.

4. **Construction Power and Distribution Service:** It is the sole responsibility of the Interconnection Customer to make arrangements for both construction and station power, which may be required for the Interconnection Customer's generation facility. **Additionally, if the Interconnection Customer's substation(s) and/or construction site(s) are located outside of the SPS service area, SPS cannot provide station power (retail distribution service) and the Interconnection Customer needs to make arrangements for distribution service from the local retail provider.**

5. **Project and Operating Concerns:**

5.1. Close work between the Transmission group, the Interconnection Customer's personnel and local operating groups will be imperative in order to meet any in-service date that has been established

5.2. The Interconnection customer will be required to maintain a Power Factor of 0.95 lagging and a 0.95 leading at the Point of Interconnection (POI), which is based on SPP's SIS Table on page 16. 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, is available at: (http://www.xcelenergy.com/Texas/Company/Transmission/Pages/Transmission_Services_Interconnection_Guidelines.aspx).

6. **Fault Current Study:** The available fault current at the interconnection location, without and with any contribution from the new generator facilities, is shown in Table 2.

Table 2, - Available fault current at interconnection location

Short Circuit Information without contribution from new Generator Facilities (GEN 2010-006)				
Fault Location	Fault Current (Amps)		Impedance (Ω)	
	Line-to-Ground	3–Phase	Z^+	Z^0
230 kV Bus	14,477	11,920	0.9543 + j11.0988	0.324 + j5.246

Short Circuit Information with the contribution from new Generator Facilities (GEN 2010-006)				
Fault Location	Fault Current (Amps)		Impedance (Ω)	
	Line-to-Ground	3–Phase	Z^+	Z^0
230 kV Bus	16,851	13,871	0.7184 + j9.5463	0.2519 + j4.5065

Estimated Construction Costs

The projects required for the interconnection of 205 MW Gas Generator facilities consist of the projects summarized in the table below.

Table 3, Required Interconnection Projects[c]

Project	Description	Estimated Cost
	Network Upgrades	
1	Disturbance Monitoring Device	$ 0
2	Transmission Line Work	$ 0
3	Right-Of-Way	$ 0
4	230 kV Breaker Line Terminal	$ 1,124,014
5	Remote Terminal Unit (RTU) and DFR	$ 54,500
	Subtotal:	**$ 1,178,514**
	Transmission Owner Interconnection Facilities (at the Interconnection Customer's expense)	
6	Communications [d]	*$ See footnote*
7	Revenue metering	$ 200,000
8	230 kV Line arrestors	$ 30,000
	Subtotal:	**$ 230,000**
	Total Cost	**$ 1,408,514**

Engineering and Construction:

An engineering and construction schedule for this project is estimated at approximately 6 months. Other factors associated with clearances, equipment delays and work schedules could cause additional delays. The is applicable after all required agreements are signed and internal approvals are granted.

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

[c] The cost estimates are 2010 dollars with an accuracy level of ±20%.

[d] It is the Requester's responsibility to provide both the data circuit and both dial-up telephone circuits, see Section 1.13.

Appendix A

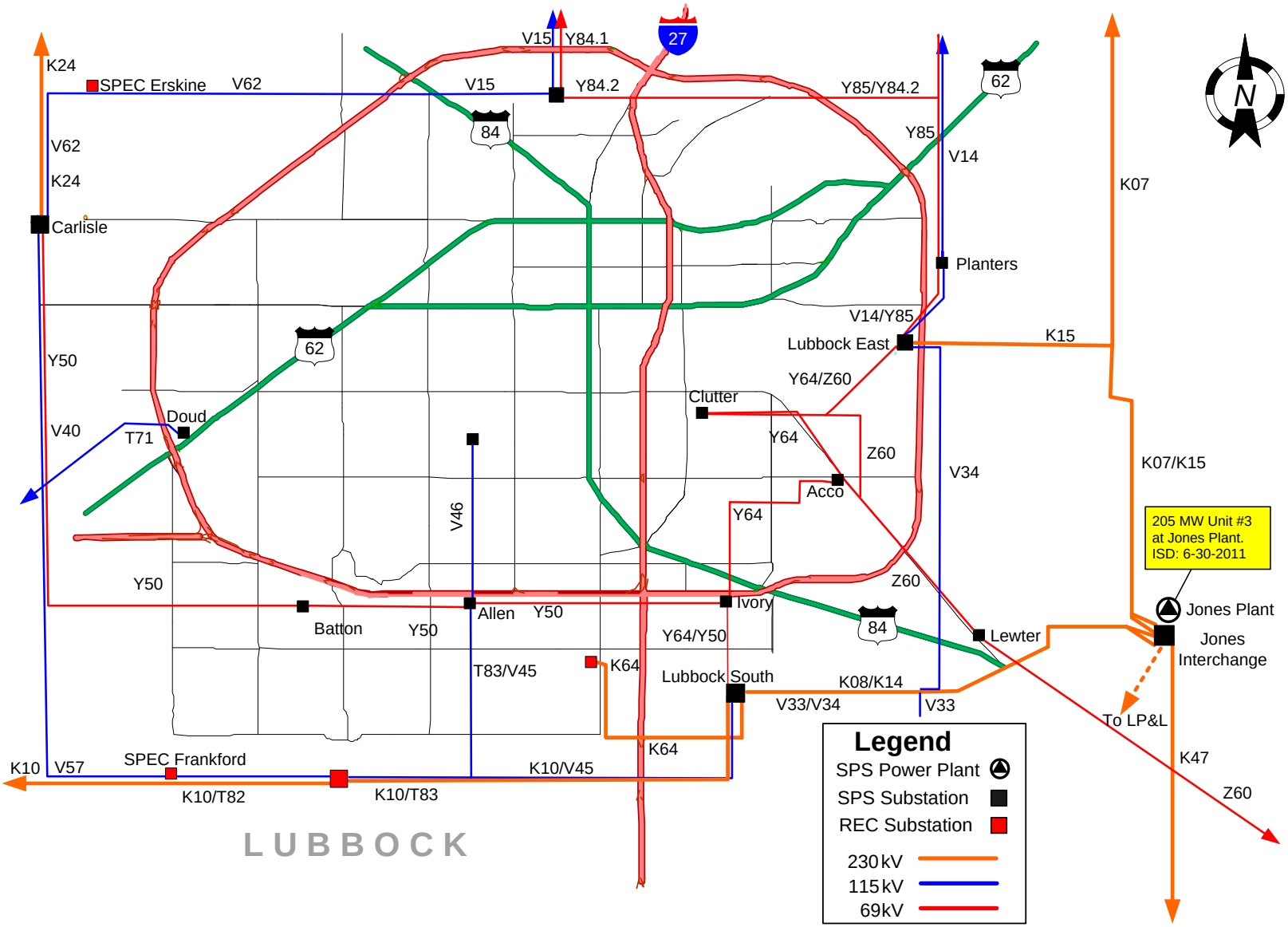


Figure A- 1 Approximate location of Jones Interchange

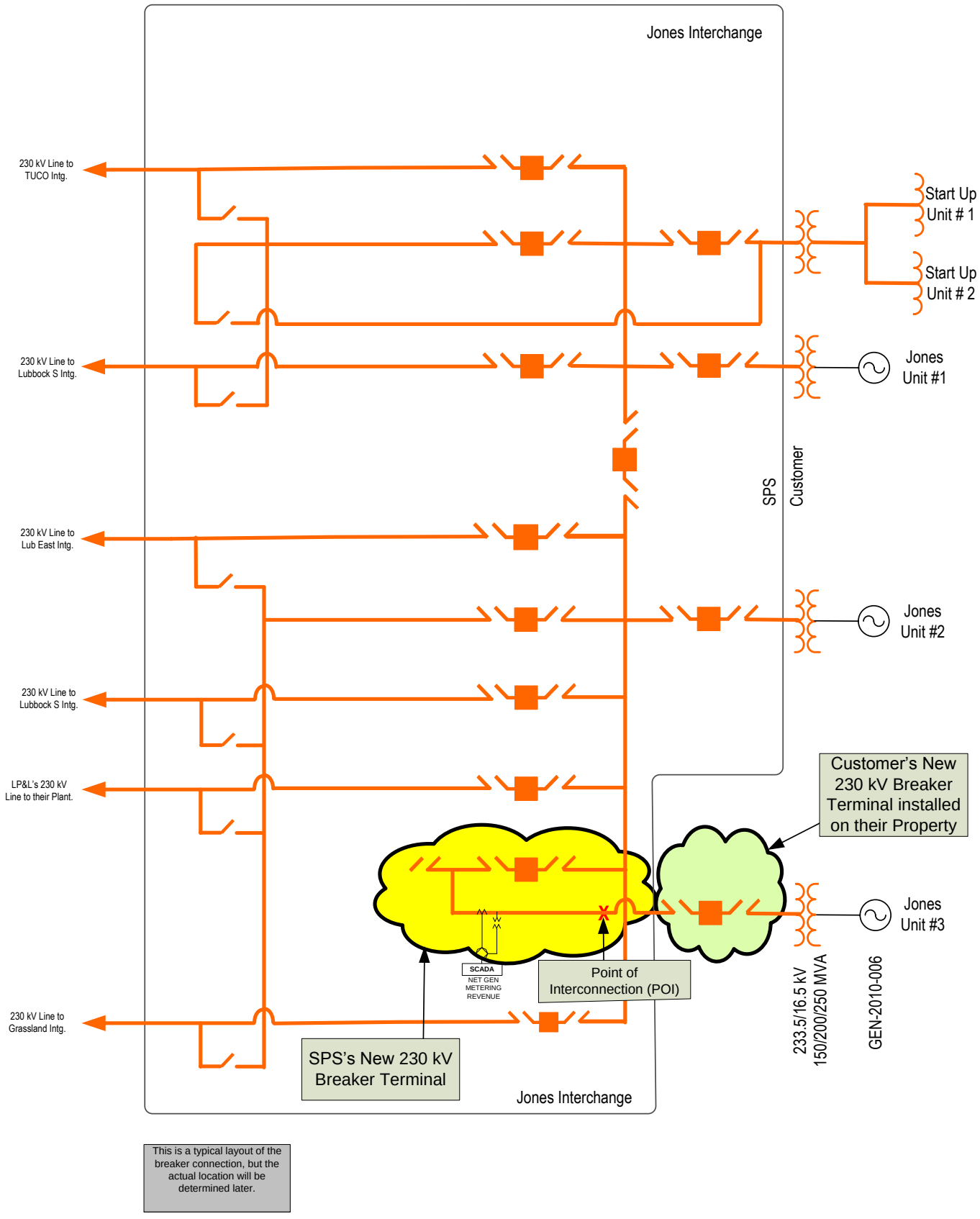


Figure A- 2 One-line Diagram of New Switching Station

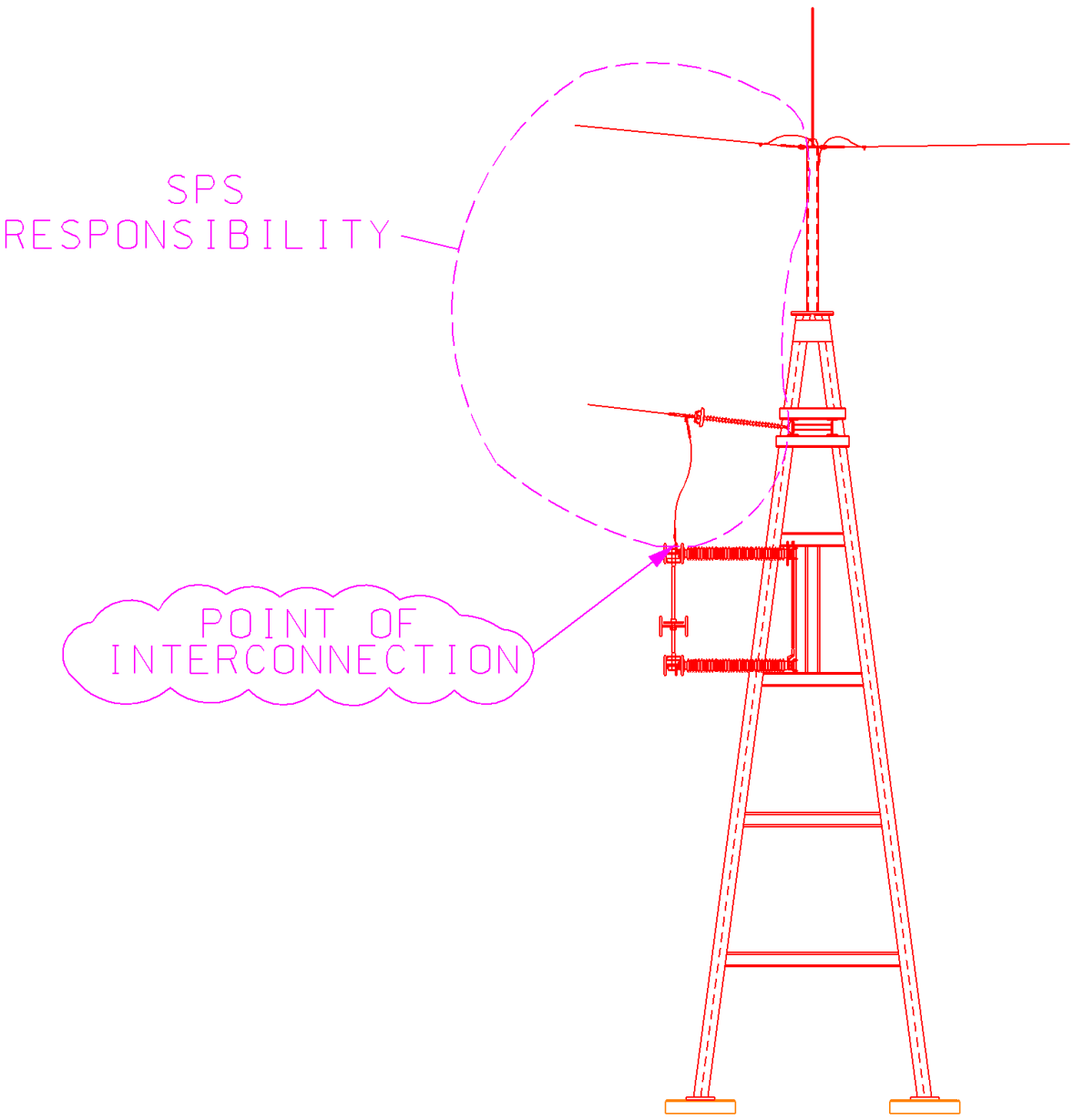


Figure A- 3 Point of Interconnection & Change of Ownership (Typical)

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