

GI-2020-18
Facilities Study Report

4.5MW Hydro Generating Facility
Vineland 69kV Substation

8/5/2021



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1.0 Executive Summary

GI-2020-18 is a 4.5MW Hydroelectric Generating Facility interconnection at the Vineland 69kV Substation. The Generating Facility requested ERIS.

The study did not identify any impacts to the PSCo facilities or the Affected System facilities.

The maximum permissible Energy Resource Interconnection Service of GI-2020-18 before Network Upgrades is 4.5MW.

Energy Resource Interconnection Service of GI-2020-18 is 4.5MW.

The total estimated cost of the transmission system improvements required for GI-2020-18 is 4.759 Million (Tables 1 and 2).

Tables 1 and 2 list the improvements required to accommodate the interconnection of GI-2020-18. Based on the 18 month construction timeframe for facilities, the backfeed date of December 2021 or the COD of June 2022 are not achievable.

Note: Interconnection Service in and itself does not convey Transmission Service.

2.0 Introduction

GI-2020-18 is a 4.5MW Hydroelectric Generating Facility interconnection at the Vineland 69kV Substation. The request is a modification to the existing hydro facility connected on the Vineland distribution feeder, resulting in an increase in the capacity from 3MW to 4.5MW and change in the Point of Interconnection (POI) from the distribution feeder to the Vineland 69kV Substation. The Generating Facility will be located in Mesa County, Colorado and requested Energy Resource Interconnection Service (ERIS)¹ evaluation.

GI-2020-18 Hydroelectric Generating Facility is a Synchronous machine with a proposed 4.5MW generation size and power factor capability of +/- 0.9. The Generating Facility will connect to one

¹ **Energy Resource Interconnection Service** shall mean an Interconnection Service that allows the Interconnection Customer to connect its Generating Facility to the Transmission Provider's Transmission System to be eligible to deliver the Generating Facility's electric output using the existing firm or non-firm capacity of the Transmission Provider's Transmission System on an as available basis. Energy Resource Interconnection Service in and of itself does not convey transmission service



(1) 4.16/69kV, 5MVA, X/R = 10 delta/grounded-wye three-phase main step-up transformer which in turn will connect to the Vineland Substation via a 0.38mile generation tie-line.

The proposed Commercial Operating date (COD) of GI-2020-18 is June 2022. Per the standard interconnection practices, the backfeed date is assumed to be approximately six months before the COD, i.e., December 2021.

The System Impact Study report report is posted at the following link :

https://www.rmao.com/public/wtpp/Final_Studies/GI-2020-18%20System%20Impact%20Study%20Draft_final.pdf

The Interconnection Facilities Study specifies and estimates the cost of the equipment, engineering, procurement and construction work needed to implement the conclusions of the system impact study.

3.0 Cost Estimates and Assumptions

The cost estimates are in 2021 dollars with escalation and contingencies applied. Allowances for Funds Used During Construction (AFUDC) is not included. The estimated costs include all applicable labor and overheads associated with the siting, engineering, design, and construction of these new PSCo facilities. The estimate does not include the cost for any Interconnection Customer owned equipment and associated design and engineering.

Tables 1 and 2 list the improvements required to accommodate the interconnection of GI-2020-18. Based on the 18 month construction timeframe for facilities, the backfeed date of December 2021 or the COD of June 2022 are not achievable.

The total cost of the required transmission improvement required for GI-2020-18 to interconnect at the Vineland 69kV Substation is \$4.759 Million. The cost responsibilities associated with these facilities shall be handled as per current FERC guidelines.

- The cost of Transmission Provider's Interconnection Facilities is \$1.097 Million (Table 1)
- The cost of Station Network Upgrades is \$3.662 Million (Table 2)

Table 1 – Transmission Provider's Interconnection Facilities

Element	Description	Cost Est. (Millions)
PSCo's Vineland Substation 69kV bus	Interconnect GI-2020-18 at the Vineland 69kV bus. The new equipment includes: <ul style="list-style-type: none"> • Deadend and structures • One (1) 69kV 3000A Circuit Breaker • Two (2) 69kV 3000A Switch • One set (of three) high side metering units • Fiber communication equipment • Station controls • Associated electrical equipment, bus, wiring and grounding • Associated foundations and structures • Associated transmission line communications, fiber, relaying and testing 	\$0.922
	Transmission line tap into substation:	\$0.155
	Siting and Land Rights support for permitting and construction	\$0.020
	Total Cost Estimate for Transmission Providers Interconnection Facilities	\$1.097
Time Frame	Site, design, procure and construct	18 Months

Table 2 – Station Network Upgrades

Element	Description	Cost Est. (Millions)
PSCo's Vineland Substation 69kV bus	Reconfigure Vineland Substation to accommodate GI-2020-18. The new equipment includes: <ul style="list-style-type: none"> • Two (2) 69kV 3000A circuit breakers • Four (4) 69kV 3000A disconnect switches • Electrical Equipment Enclosure (EEE) • Station controls and wiring • Associated electrical equipment, bus, wiring and grounding • Associated foundations and structures • Associated transmission line communications, fiber, relaying and testing. 	\$3.292
	Reconfiguration of Line 6671 Substation terminations.	\$0.350
	Siting and Land Rights support for substation site acquisition, permitting, and construction	\$0.020
	Total Cost Estimate for Network Upgrades for Interconnection	\$3.662
Time Frame	Site, design, procure and construct	18 Months

- Estimates are based on 2021 dollars (appropriate contingency and escalation applied).
- “Allowance for Funds Used During Construction” (AFUDC) has been excluded.
- Labor is estimated for straight time only – no overtime included.
- Lead times for materials were considered for the schedule.
- PSCo (or it’s Contractor) crews will perform all construction, wiring, testing and commissioning for PSCo owned and maintained facilities.
- PSCo does not anticipate that a CPCN will be required for the interconnection facilities construction.
- The estimated time to permit, design, procure and construct the interconnection facilities is approximately 18 months after authorization to proceed has been obtained.
- Customer will install two (2) redundant fiber optics circuits into the Transmission provider’s substation
- Power Quality Metering (PQM) will be required on the Customer’s 69kV line terminating into the Vineland Substation.
- The Customer will be required to design, procure, install, own, operate and maintain a Load Frequency/Automated Generation Control (LF/AGC) RTU at their Customer Substation. PSCo / Xcel will need indications, readings and data from the LFAGC RTU.

4.0 Conclusion

The maximum permissible Energy Resource Interconnection Service of GI-2020-18 before Network Upgrades is 4.5MW.

Energy Resource Interconnection Service of GI-2020-18 is 4.5MW.

The total estimated cost of the transmission system improvements required for GI-2020-18 is 4.759 Million (Tables 1 and 2).

Note: Interconnection Service in and itself does not convey Transmission Service.