

GI-2020-13

Draft

Interconnection Facilities Study

Phase 4 Report

4/08/2022



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1.0 Summary

This report only includes the Interconnection Customer's Interconnection Facilities and should be read in conjunction with the ***DISIS-2020-002 Cluster Interconnection Facilities Study Phase 4 Report*** located at: [Transmission Studies \(rmao.com\)](https://www.rmao.com).

GI-2020-13 is a 374 MWac net rated AC-Coupled solar Photovoltaic (PV) plus Battery Energy Storage (BES) Generating Facility requesting Energy Resource Interconnection Service (ERIS). The requested Point of Interconnection (POI) is a tap on the Boone – Midway 230 kV line at approximately 26 miles from the Midway 230 kV Substation.

The total estimated cost of the transmission system improvements for GI-2020-13: \$24.870 million.

Energy Resource Interconnection Service of GI-2020-13 is: 374 MW (after required transmission system improvements identified in Table 3.2.1 for the Station Network Upgrades and Table 4.1 for the System Network Upgrades in the *DISIS-2020-002 Cluster Interconnection Facilities Study Phase 4 Report*, and Table 1 below for the Transmission Providers Interconnection Facilities).

The Generation Interconnection Service identified in this report in and of itself does not convey transmission service.

2.0 Introduction

GI-2020-13 is a 250 MWac solar PV plus 124 MWac BES Hybrid Generating Facility located in Pueblo County, Colorado. The hybrid facility will be AC-Coupled with the net output at the POI limited to 374 MWac using a Power Plant Controller. The Solar PV Generating Facility will consist of seventy-four (74) Sungrow SG3600UD 3.6 MVA, ± 0.95 PF inverters, each with its own 0.63/34.5 kV, 3.6 MVA Delta/Wye-grounded, $Z=8.5\%$ and $X/R=10.8$ pad-mount transformer. The BES Generating Facility will consist of thirty-seven (37) Power Electronics FP3510K 3.51 MVA, ± 0.95 PF inverters, each with its own 0.66/34.5 kV, 3.5 MVA Delta/Wye-grounded, $Z=8.5\%$ and $X/R=10.8$ pad-mount transformer. The 34.5 kV Collector system of the solar PV and BES generators will connect to three (3) 99/124/165 MVA, 230/34.5/13.8 kV Wye-grounded/Wye-grounded/Delta, $Z=10\%$ and $X/R=51$ main step-up transformers which will



connect to the PSCo transmission system via a 0.5-mile, 230 kV generation tie-line. The POI requested is a tap on the Boone – Midway 230 kV line at approximately 26 miles from the Midway 230 kV Substation.

The BES inverters have a maximum and minimum state of charge of 100% and 5% respectively.

GI-2020-13 requested ERIS¹.

The interconnection at the tap point will require building a new switching station is referred to as “GI-2020-13 230 kV Switching Station” in this report.

The proposed Commercial Operation Date (COD) of GI-2020-13 is December 1, 2024. For the study purpose, the back-feed date is assumed to be June 1, 2024, approximately six (6) months before the COD. PSCo is unable to meet the requested COD.

3.0 Study Scope

The scope of the Interconnection Facilities Study which is Phase 4 of the Definitive Interconnection Study process includes non-binding cost estimates and construction schedule of the Interconnection Facilities and Network Upgrades identified for GI-2020-13 in the [DISIS-2020-002 Phase 2 Study Report](#) dated 8/26/2021 and [DISIS-2020-002 Phase 2 Study Report - Addendum](#) dated 9/14/2021.

4.0 Cost Estimates

The cost responsibilities associated with these facilities shall be handled as per current FERC guidelines.

The total cost of the required transmission improvement required for GI-2020-13 to interconnect at the GI-2020-13 230 kV Switching Station is \$24.870 million.

- The cost of Transmission Provider’s Interconnection Facilities is \$1.262 million (Table 1).

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

- The cost of Station Network Upgrades is \$19.319 million (See Table 3.2.1 of **DISIS-2020-002 Cluster Interconnection Facilities Study Phase 4 Report**).
- The cost of other System Network Upgrades is \$4.289 million (See Table 4.2 of **DISIS-2020-002 Cluster Interconnection Facilities Study Phase 4 Report**).

Table 1 – GI-2020-13 Transmission Provider’s Interconnection Facilities

Element	Description	Cost Est. (million)
PSCo’s GI-2020-13 230 kV Switching Station	Interconnection GI-2020-13 tapping the Boone - Midway 230 kV line. The new equipment includes: <ul style="list-style-type: none"> • (3) 230 kV deadend structures • (3) 230 kV surge arresters • (1) 230 kV 3,000 A disconnect switch • (3) CCVTs • (3) CTs • Fiber communication equipment • Station controls • Associated electrical equipment, bus, wiring and grounding • Associated foundations and structures • Associated transmission line communications, fiber, relaying and testing. 	\$1.162
	Siting and Land Rights support for siting studies, land and ROW acquisition and construction	\$0.100
Total Cost Estimate for Interconnection Customer-Funded, PSCo-Owned Interconnection Facilities		\$1.262
Time Frame	Site, design, procure and construct	36 Months*

*Construction of the Interconnection Customer’s Interconnection Facilities are reliant on the construction of the GI-2020-13 230 kV Switching Station, which will take 36 months. PSCo will complete the Interconnection Customer’s Interconnection Facilities in this same timeframe. Construction of the GI-2020-13 230 kV Switching Station requires a Certificate of Public Convenience and Necessity (CPCN) from the Colorado Public Utilities Commission. It is expected that the CPCN proceedings may take up to 18 months. The construction timeframe following the CPCN approval is estimated to take up to 18 months, so the total time required to site, design, procure and construct the GI-2020-13 230 kV Switching Station is expected to take up to 36 months.