

GI-2020-07

Interconnection Facilities Study

Phase 4 Report

3/31/2022



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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-2020-001 Cluster Interconnection Facilities Study Phase 4 Report*** located at: [Transmission Studies \(rmao.com\)](https://www.rmao.com).

GI-2020-7 is a 1,000 MWac net rated hybrid (700 MW Wind plus 300 MW Solar) Generating Facility requesting Energy Resource Interconnection Service (ERIS). The Point of Interconnection (POI) is Mirasol 345 kV Station.

The total estimated cost of the transmission system improvements for GI-2020-7: \$42.009 million.

Energy Resource Interconnection Service of GI-2020-7 is: 1,000 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-2020-001 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-2020-7 is a 1,000 MWac net rated solar photovoltaic (PV) and wind hybrid Generating Facility that will be located in Pueblo County, Colorado. The wind Generating Facility will consist of three hundred fifty-four (354) GE 2.5 MW, ± 0.90 PF wind turbines, each with its own 0.69/34.5 kV, 2.9 MVA, $Z=6.06\%$ and $X/R=7.5$ wye-gnd/delta pad-mounted step-up transformer. The solar PV Generating Facility will consist of one hundred ten (110) FS3430M 3.43 MVA, ± 0.90 PF inverters, each with its own 0.66/34.5 kV, 3.51 MVA, $Z=8.5\%$ and $X/R=7.5$ wye-gnd/delta pad-mounted step-up transformer. The 34.5 kV collector system of the PV and the wind Generating Facilities will connect to three (3) 168/224/280 MVA, 34.5/13.8/345 kV wye-gnd/delta/wye-gnd, $Z=8.5\%$ and $X/R=40$ main step-up transformers for wind and one (1) 201/268/335 MVA, $Z=8.5\%$ and $X/R=40$ main step-up transformer for solar PV which will connect to the PSCo transmission system via a 150-mile 345 kV generation tie-line. The POI is



Mirasol 345 kV Station, which is a new switching station in Pueblo County, approximately 10 miles from the existing Comanche Substation. The output of the hybrid Generating Facility will be limited to 1,000 MW at the POI using centralized power plant controller.

GI-2020-7 requested ERIS¹.

The proposed COD of GI-2020-7 is December 1, 2023. For the study purpose, the back-feed date is assumed to be June 1, 2023, 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-2020-7 in the [DISIS-2020-001 Phase 2 Report](#) dated 8/19/2021 and [DISIS-2020-001 Phase 2 Study Report Addendum](#) dated 9/15/2021.

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-2020-7 to interconnect at the Mirasol 345 kV Station is \$42.010 million.

- The cost of Transmission Provider's Interconnection Facilities is \$1.647 million (Table 1)
- The cost of Station Network Upgrades is \$27.810 million (See Table 3.2.1 of ***DISIS-2020-001 Cluster Interconnection Facilities Study Phase 4 Report***).
- The cost of other System Network Upgrades is \$12.553 million (See Table 4.2 of ***DISIS-2020-001 Cluster Interconnection Facilities Study Phase 4 Report***).

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

Table 1 – GI-2020-7 Transmission Provider’s Interconnection Facilities

Element	Description	Cost Est. (million)
PSCo’s Mirasol 345 kV Switching Station	Interconnection Customer to tap at the Mirasol 345 kV Switching Station. The new equipment includes: <ul style="list-style-type: none"> • (1) 345 kV deadend/girder • (3) 345 kV Surge Arresters • (1) 345 kV 3,000 A disconnect switch • (1) 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. 	\$1.627
PSCo’s Mirasol 345 kV Switching Station	Siting and Land Rights support for siting studies, land and ROW acquisition and construction	\$0.020
Total Cost Estimate for Interconnection Customer-Funded, PSCo-Owned Interconnection Facilities		\$1.647
Time Frame	Site, design, procure and construct	36 Months*

*Construction of the Interconnection Customer’s Interconnection Facilities are reliant on the construction of the Mirasol 345 kV Station, which will take 36 months. PSCo will complete the Interconnection Customer’s Interconnection Facilities in this same timeframe. Construction of the Mirasol 345 kV 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 Mirasol 345 kV Station is expected to take up to 36 months.