

# **Spring Substation Project (Morgan Hill Area) Description and Functional Specifications for Competitive Solicitation**

## 1. Description

In the 2013-2014 Transmission Planning Cycle, the ISO approved the construction of a reliability-driven *Morgan Hill Area Reinforcement Project* in the San Jose Division of the PG&E service territory. The project will provide the Morgan Hill Area, as well as the San Jose Area, with a more reinforced 230 kV source from the new Spring Substation. A simplified single-line diagram of the existing and proposed project is shown below in Figures 1 and 2.

Figure 1: Existing single-line diagram of the Morgan Hill Area

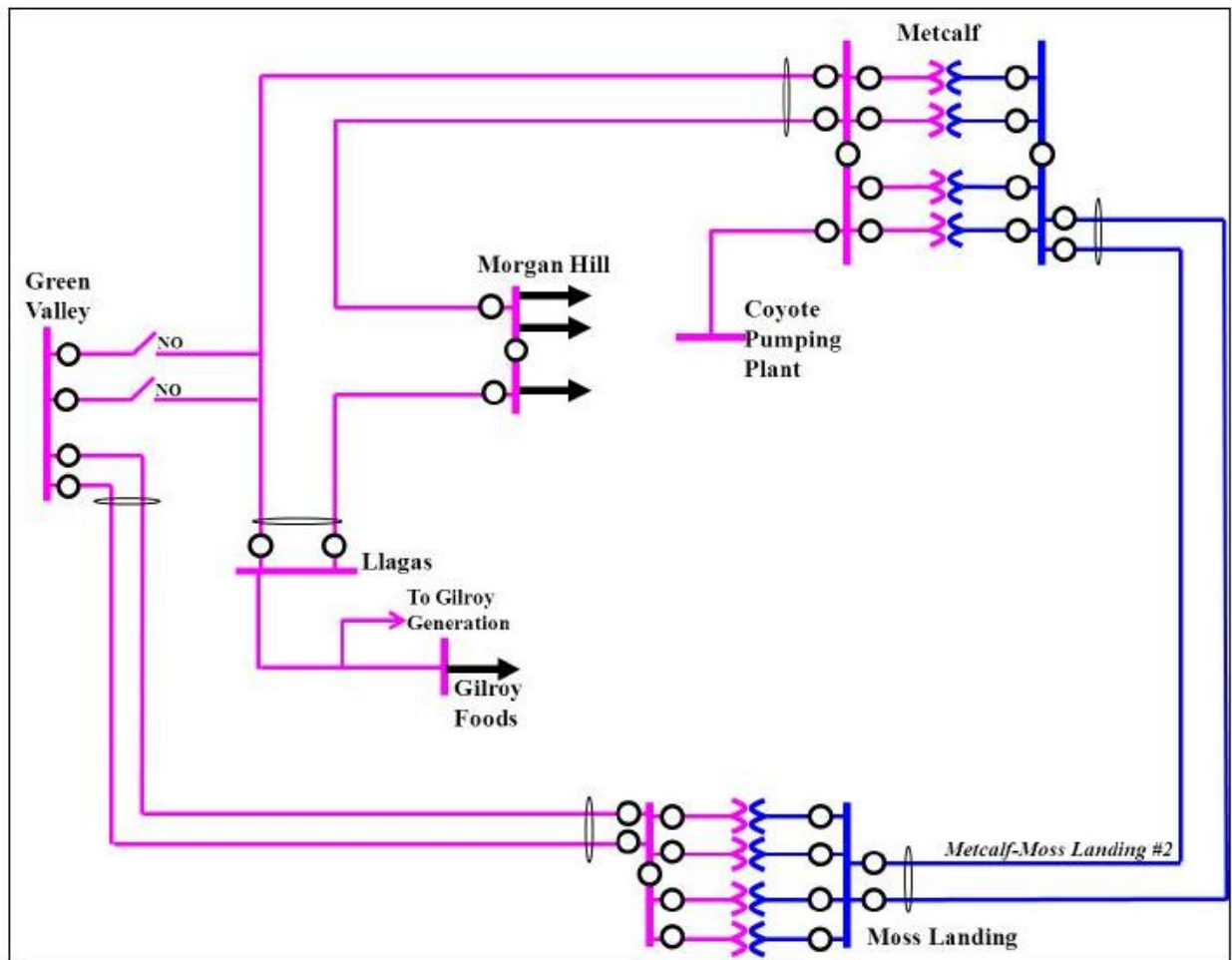
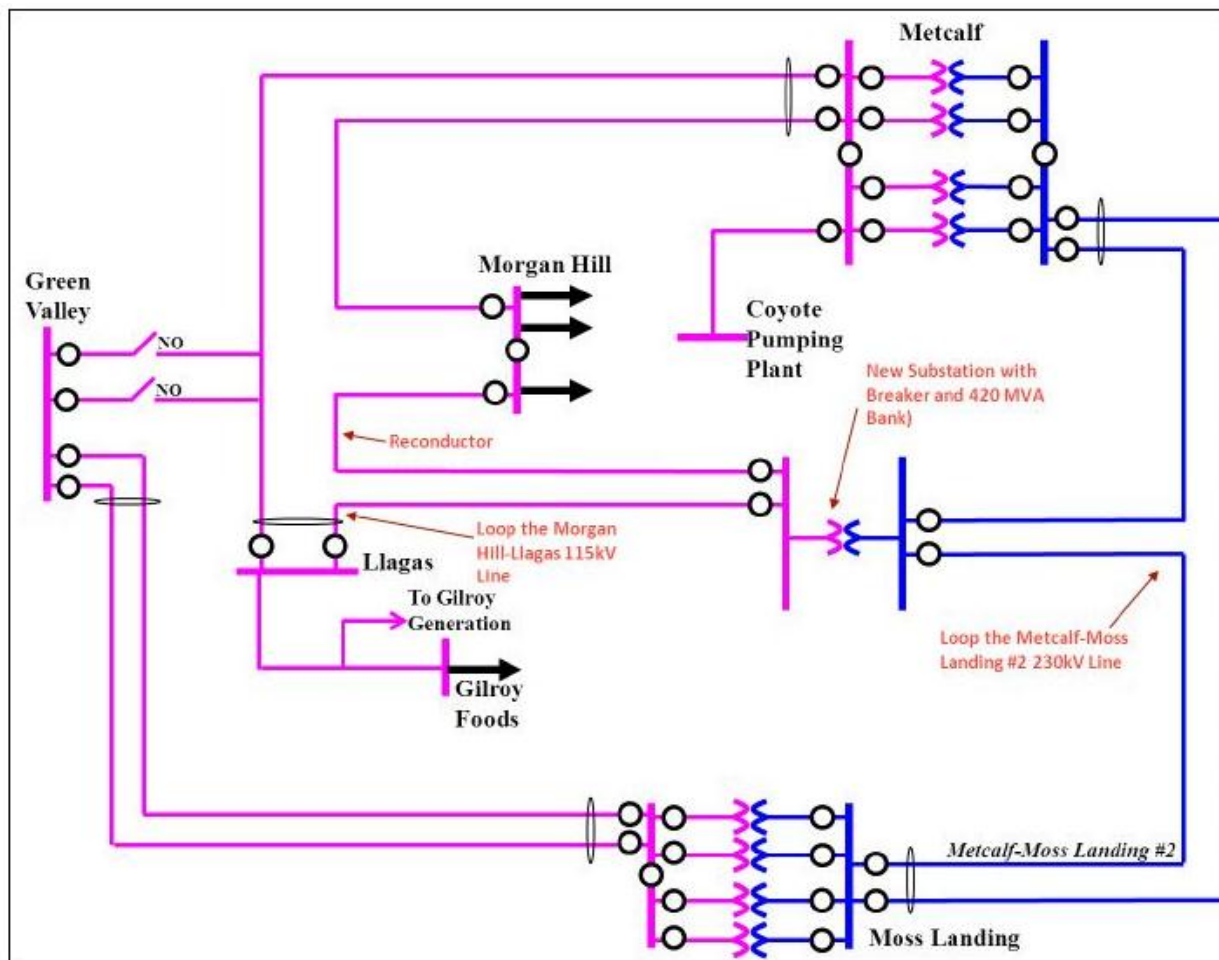


Figure 2: Proposed single-line diagram of the Morgan Hill Area Reinforcement Project with the new Spring Substation



The scope of this project includes:

- Construct a new 230/115 kV substation, Spring Substation, west of the existing Morgan Hill Substation.
- Install a new 230/115 kV 420 MVA transformer at Spring Substation.
- Loop the existing Morgan Hill-Llagas 115 kV Line into Spring 115 kV bus using a portion of the idle Green Valley-Llagas 115 kV Line Right-of-Way.
- Reconductor the Spring-Llagas 115 kV Line with bundled 715 Al or similar.
- Loop the Metcalf-Moss Landing No.2 230 kV Line into the Spring Substation 230 kV bus

This project was submitted through the 2013 Request Window and approved during the 2013-2014 CAISO TPP.

This project will mitigate thermal and voltage violations. These violations arise following the loss of the Llagas-Gilroy Peakers 115 kV Line and either one of the 115 kV Lines heading north to Metcalf Substation.

In addition, at the onset of the Category C DCTL with loss of Metcalf–Morgan Hill 115kV Line & Metcalf-Llagas 115kv Line, the Consequential Load Drop of the Llagas and Morgan Hill substations will result in about 170 MW of load dropped.

The ISO estimates that the proposed *Morgan Hill Area Reinforcement Project* in its entirety will cost between \$35 million and \$45 million in 2014 dollars. The proposed in-service date of the project is May 2021.

The facilities in the Morgan Hill Area Reinforcement project that are eligible for competitive solicitation are the 230 kV bus-work and termination equipment, and the 230/115 kV transformer at Spring Substation. The 115 kV bus-work and termination equipment and modifications to existing facilities are not eligible for competitive solicitation.

For the interconnection of the existing 230kV lines to the Spring substation, the incumbent PTO (PG&E) will be responsible to bring the new transmission line extensions up to a point within 100 feet of the new substation fence. The new line extensions will terminate on a dead end structure(s), to be owned by PG&E. The approved project sponsor will be responsible (and will own and maintain) the facilities from this last dead end structure(s) into the high voltage rack. The approved project sponsor, who will be the owner of the 230 kV yard of the substation, will be responsible to own, operate and maintain the protection equipment located within the substation that is designated for the protection of the incoming transmission lines. The approved project sponsor will coordinate with PG&E for the specifications and the details of the associated line protection (e.g. current differential, directional comparison) etc. and will work with PG&E to develop relay logic and detailed relay settings.

While the low voltage facilities, 115 kV bus-work and termination equipment are not a part of the scope of the facilities for competitive solicitation, the approved project sponsor will be required to coordinate with PG&E to determine the total amount of acreage required to build the entire facility. Further, the approved project sponsor will be responsible to acquire the station land and necessary environmental permits from the applicable siting agency for both the 230 kV and 115 kV yards, and will grant a permanent easement or transfer of ownership of a parcel of land to PG&E for PG&E's portion of the total station equipment. This will ensure that there is adequate property purchased and made available to accommodate the initial and ultimate configuration of both yards. The approved project sponsor will coordinate with PG&E as to how to divide the two yards. The approved project sponsor will be responsible to provide initial grading and drainage of both yards. The approved project sponsor will negotiate with PG&E as to how to divide the two yards. The project sponsor shall coordinate and negotiate with PG&E on how the low side of the transformer is to be interconnected to the bus in the low voltage 115 kV yard. PG&E will specify the phase rotation for the termination to the 115 kV bus in the low voltage yard.

With respect to protection and control buildings, the approved project sponsor and PG&E will install, own and maintain separate protection and control buildings for their respective substation yards.

## 2. Functional Specification

### Substation

Nominal Phase to Phase Voltage: 230/115kV

Initial Bus Configuration: Breaker and a half (BAAH)

Ultimate Bus Configuration: BAAH

Initial Number of 230 kV Lines: 2

Ultimate Number of 230 kV Lines: 4

Initial Number of 230 kV CBs: 5

Ultimate Number of 230 kV CBs: 12

Initial Minimum Bus Ampacity: 3000A Ultimate Bus Ampacity: 3000A

Minimum CB Ampacity: 2000A Minimum CB Interrupting Capability: 63 kA

Transfer Bus Required (SBSB only): N/A

Station Minimum BIL: 900 kV

Initial Reactive Power Requirements: None

Ultimate Reactive Power Requirements: To be determined

Telemetry Requirements: Install necessary equipment, including RTUs to monitor the typical bulk power elements such as MW, MVAR, and phase currents (Amps) at each line and also voltages (kV) at lines and buses and all circuit breaker (CB) status/control, protection relays statuses and alarms. The installed equipment must be capable of transmitting information to the appropriate Control Center.

Latest In Service Date: May 2021

Low Profile Required: Subject to local permitting requirements

Gas Insulation Required: No

Initial Number of Transformers: 1

Ultimate Number of Transformers: 2

Transformer Nominal Low Winding Phase to Phase Voltage: 115 kV

Tertiary Winding Required: Yes Nominal Voltage Rating: 13.2 kV

Primary Voltage Winding (wye, grounded wye, delta, etc): Grounded Wye

Secondary Voltage Winding: Grounded Wye Tertiary Voltage Winding: Corner Grounded Delta

Maximum Transformer % IZ: 6.5% Minimum Transformer % IZ: 5.5%

Minimum Transformer OA Rating: 252 MVA

Maximum Transformer Load: 420 MVA LTC Required: Yes +/- 10 %

No Load Taps Required: 5 NLTs with two 2.5% taps above & below nominal voltage of 230 kV