# Generating Facility Interconnections
# Electric Rule No. 21

## Supplemental Review

### County of Fresno

County of Fresno (Juvenile Hall)

3333 E American Avenue

Fresno, California 93725

### 2,760 kW Photovoltaic Generators

Queue #1788-RD (Not# 114211709)

(Meter # 1010019100)

**Pacific Gas and Electric Company**
**24 April 2018**
**Revision**

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# 1. Executive Summary

## 1.1 Generation Interconnection Request

County of Fresno, an Interconnection Customer (IC), has requested a Generating Facility (GF) interconnection for County of Fresno (Juvenile Hall) (Project) to the Pacific Gas and Electric Company (PG&E)'s distribution system for a 2,760 kW Photovoltaic generating facility to be located at 3333 E American Avenue, Fresno, California 93725. The Generating Facility will be connected to PG&E's Malaga 1102 (254251102) distribution circuit. Interconnection will be in accordance with CPUC's Generating Facility Interconnections, Electric Rule 21. The customer-requested operating date for the Project is TBD. This Project has been assigned the Queue# 1788-RD.

## 1.2 Initial Review Summary

The Electric Generating Facility Interconnections, Electric Rule 21, Initial Review Process has determined that the generating facility, County of Fresno (Juvenile Hall) Photovoltaic generator proposed at 3333 E American Avenue, Fresno, California 93725 has **failed the Screens listed below**. Pursuant to Section G of the Generating Facility Interconnection, PG&E cannot determine the interconnection requirements for this project without further study. Here is a summary of the failed screen and the issues related to the screen:

**Screen I – Power will be exported across the PCC**
**Screen J – Generating Facility is greater than 11kVA**
**Screen K – Generating facility is a NEM that is greater than 500kW**
**Screen M – 15% Line Section Peak Load Issues**

## 1.3 Supplemental Review Results

| Screen | Description | Result | Reason |
|---|---|---|---|
| **Screen N** | Penetration | **PASS** | No penetration |
| **Screen O** | Power Quality and Voltage | **PASS** | |
| **Screen P** | Safety and Reliability | **PASS** | Place 1102/2 reclosing interval to 10 & 15 seconds |

The supplemental review process determines that County of Fresno (Juvenile Hall) at 3333 E American Avenue, Fresno, California 93725 meet the interconnection requirements beyond those for simplified interconnection once PG&E Primary Service is establish under new business application.

The non-binding estimated construction schedule to engineer and construct the facilities is approximately **6-10 months** from the assignment of the PG&E Project Manager for the implementation phase.

The non-binding cost estimate of the Interconnection Facilities to interconnect the project would be approximately **$55,000** excluding ITCC and Cost of Ownership since the new service is to be installed under new business application.

**Mitigations Required:**

- Place Malaga 1102/2 reclosing interval to 10 & 15 seconds
- Install SCADA Mini-RTU at PCC
- Upgrade existing revenue meter

## 1.4 Next Step

The next step of the Interconnection Process is the Interconnection Agreement. Once you have reviewed the results of this Supplemental Review, please contact your EGI interconnection manager to discuss arranging a results meeting and/or next steps options.

**PG&E's Electric Rule 21:** http://www.pge.com/tariffs/tm2/pdf/ELEC_RULES_21.pdf

# 2. Project Information

## 2.1 Generating Facility Information

The generating facilities, as proposed, would be connected to PG&E's Malaga Substation. Malaga Substation has three distribution transformers that tap from 115kV Transmission Bus. The proposed 2,760 kW project would be interconnected through Malaga 1102 circuit onto an existing PG&E 12 kV distribution bus at Malaga Bank 3. The 115kV circuit breaker protects the bank. The generating facility will operate in a parallel operation with excesses power export to the PG&E system. The Project Point of Interconnection (POI) is located south of Disconnect Switch D11506 on Malaga 1102 circuits.

## 2.2 Base Cases

Bank studies were performed with the following assumptions to determine the effects of the generating facility on the distribution system. Bank studies were performed for normal conditions, assuming the base cases listed below.

**Table 2.2 - Base Case Data**

| Case 1 (Peak) [1] | Capability (kW) | Peak Load (kW) | Existing Generation (kW) |
|---|---|---|---|
| **Bank 3** | 42,030 | 27,306 | 9,010 |
| **Malaga 1101** | 10,349 | 6,073 | 1,359 |
| **Malaga 1102** | 11,333 | 6,607 | 1,526 |
| **Malaga 1103** | 12,188 | 6,714 | 3,719 |
| **Malaga 1104** | 12,103 | 7,912 | 2,406 |

| Case 2 (Minimum) | Capability (kW) | Minimum Load (kW) | Existing Generation (kW) |
|---|---|---|---|
| **Bank 3** | 42,030 | 6,287 | 9,010 |
| **Malaga 1101** | 10,349 | 1,069 | 1,359 |
| **Malaga 1102** | 11,333 | 1,775 | 1,526 |
| **Malaga 1103** | 12,188 | 2,074 | 3,719 |
| **Malaga 1104** | 12,103 | 1,368 | 2,406 |

[1] Peak and Off-Peak load calculation or load estimating for solar generation systems with no battery storage use daytime load from10 am to 4 pm while all other generation uses absolute maximum or minimum load.

## 2.3 Interconnection Assumptions

This data is based from the submitted documents and assumed in the study.

| | |
|---|---|
| **Project Name** | County of Fresno (Juvenile Hall) |
| **Customer-Proposed Commercial Operation Date** | TBD |
| **Generator(s)** | Photovoltaic<br>9,504 – Trina Solar TSM-355DE14A(II) |
| **Inverter Data** | 46 – Solectria Renewables, LLC PVI 60TL-480<br>Three-phase, 480 V |
| **Total Output and Power Factor** | 2,760kVA (2,760kW @ unity power factor) |
| **Description of Operation** | Net export to Malaga 1102 (254251102). |
| **Interconnection Transformer** | 1,500 kVA @ Z = 5.75%<br>12 kV/ 0.480 kV<br>Delta / Wye-Gnd |

## 2.4 Distribution System

These are the existing conditions at the time of this study.

| | |
|---|---|
| **Substation / Feeder** | Malaga Bank 3<br>115kV / 12 kV<br>Malaga 1102 (254251102) |
| **Primary Voltage at POI** | 12 kV |
| **Primary Line Configuration at POI** | 3-phase, 3-wire distribution circuit |
| **Maximum Symmetrical Short Circuit near POI @ 12kV** | 2650 (A) |
| **Thevenin System Impedance @ 12kV** | Z1 = ( 0.4554 + j 2.5747 ) (Ω)<br>Z0 = ( 1.37816 + j 10.0574 ) (Ω) |
| **Limiting Conductor** | 2_Cu ( 183A) - 50 ft. |
| **Upstream Voltage Regulation** | • None |
| **Upstream Protective Devices** | • CB 1102/2 |
| **Existing Significant Generation on Bank** | • See Table 2.2 |
| **Additional Proposed Generation on Bank** | • 1102/2 – 100kW<br>• 1104/2 – 692kW |

## 2.5 Maps and Diagrams

**FIGURE 1: Project Vicinity Sketch**

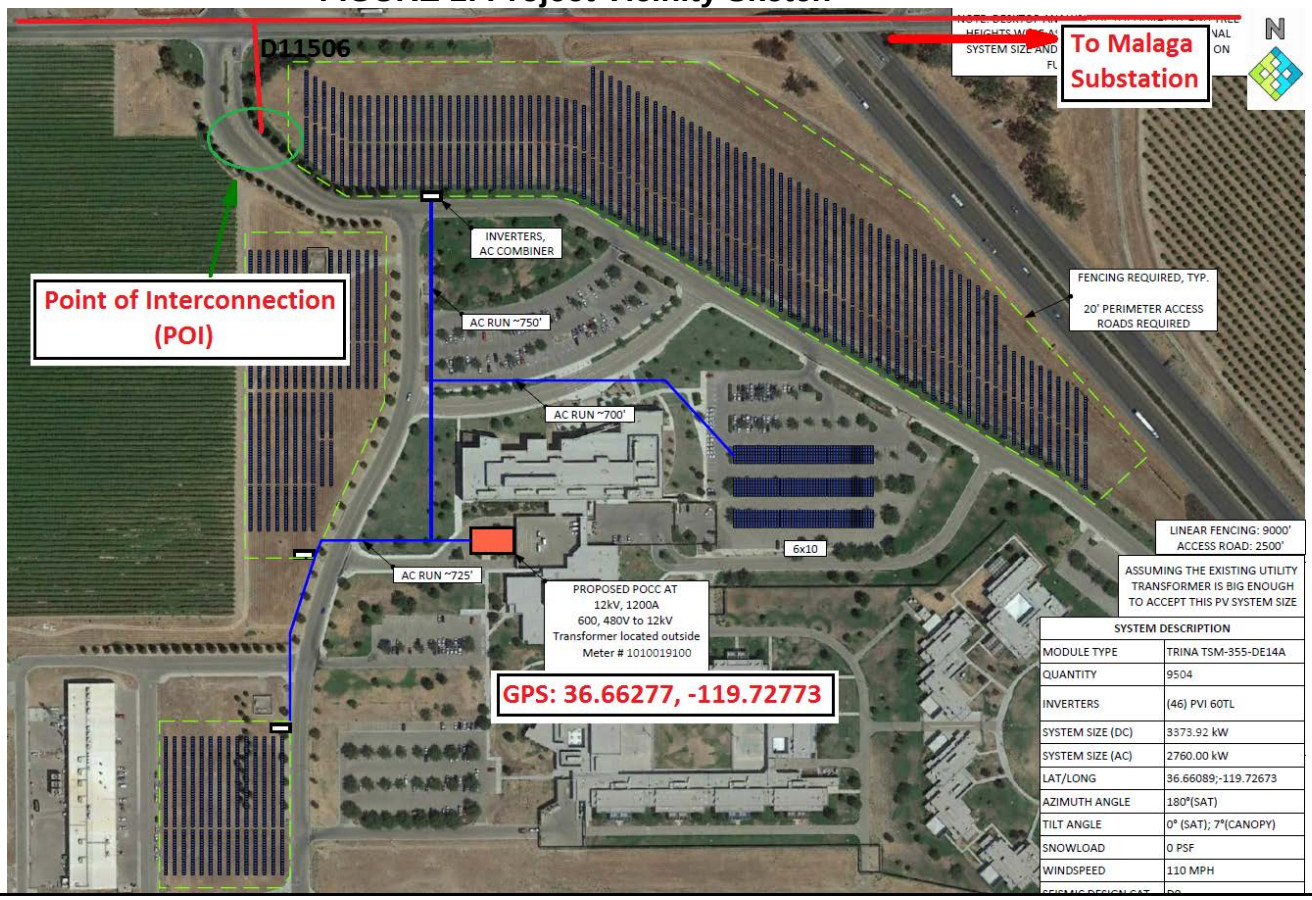
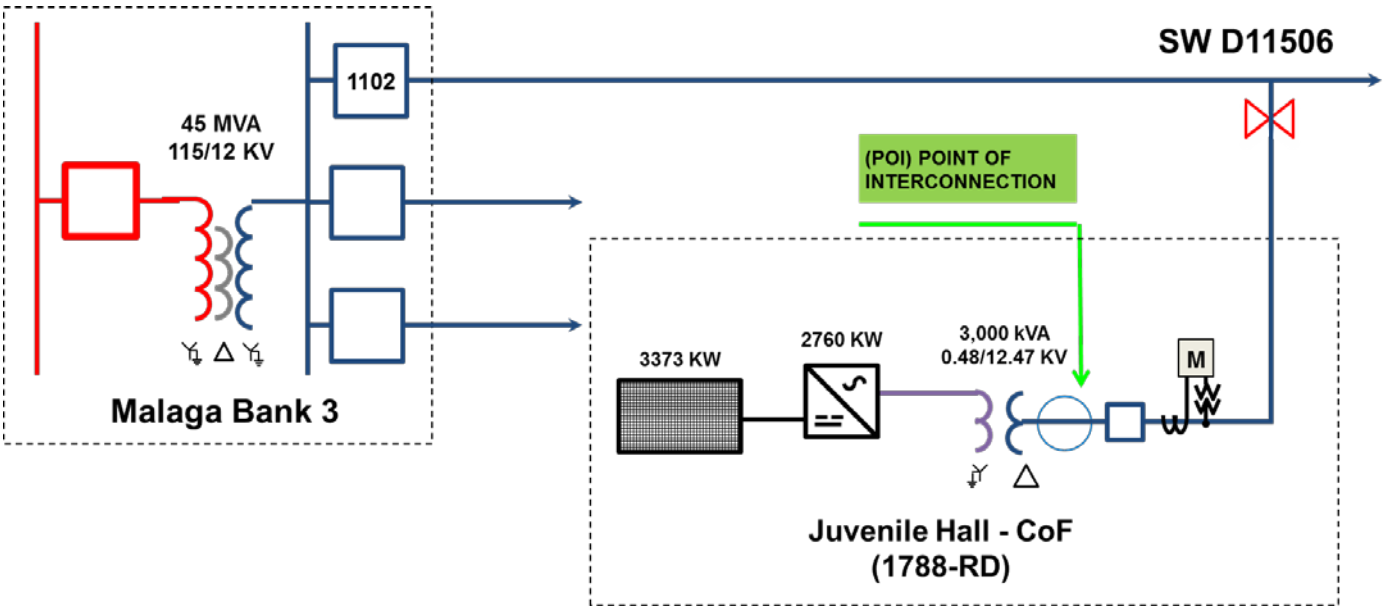



**FIGURE 2: Simplified Single Line Diagram**



# 3. Supplemental Review

## 3.1 Screen N – Penetration Test

The summer normal rated capacity for PG&E distribution substation transformers and voltage regulators is the highest applicable manufacturer's nameplate rating. The winter normal rated capacity is 1.2 times the nameplate rating. Substation regulator ratings are based on kVA transformed at maximum tap changer position.

The summer normal rated capacity for PG&E overhead distribution conductors in interior parts of the state is based on an ambient temperature of 43°C with a wind speed of two feet per second and a maximum conductor operating temperature of 75°C for aluminum and copper conductors or 80˚C for ACSR. The winter normal rated capacity is based on an ambient temperature of 16˚C with a wind speed of two feet per second.

The rated normal capacity for switches and circuit breakers on the PG&E distribution system during both summer and winter conditions is the highest applicable manufacturer's nameplate rating.

All single phase equipment on the PG&E distribution system is derated by 5% to account for the effects of phase imbalance. All air insulated equipment including overhead conductors is considered to be single phase for application of this rating. Three phase oil insulated equipment in a common tank and underground cables sharing a single conduit are not derated.

### 3.1.1 Substation Bank Loading Study

This section evaluates the effects of the worst case scenario which includes the possibility of an (N-1) contingency scenario. The (N-1) contingency scenario is when the feeder with the largest net load is tripped off which reduces the total load on the substation. The following impacts were identified:

**Table 3.A – Bank Penetration**

| Bank / Feeders | Minimum Load (kW) | Aggregate DG (kW) | Final Bank Load (kW) | | Rated Power of Bank (kW) | TRF Rating (%) |
|---|---|---|---|---|---|---|
| Bank #3 | 9,503 | 8,843 | 660 | | 42,030 | 2% |
| CB_1102 | 1,775 | 1,526 | | | | |
| CB 1101 | 1,069 | 1,359 | | | | |
| ~~CB 1103~~ | ~~2,074~~ | ~~3,719~~ | | (exclude) | | |
| CB 1104 | 1,368 | 2,406 | | | | |
| Gen Load | 5,291 | 0 | | | | |
| Queue | 0 | 792 | | | | |
| Project | 0 | 2,760 | | | | |

Queue = 399495, 305039; Gen Load is the summation of existing gen on the Bank 3.

Bank analysis indicated that under minimum loading scenarios, the interconnection of 2,760 kW of generations to the Malaga 1104 would not cause a reverse power flow through the Malaga Bank 3 onto the 115 kV Transmission system. The normal capabilities of Malaga Bank 3 are sufficient for this reverse power flow, and therefore the bank would not be overloaded.

**No Mitigations Required.**

### 3.1.2 Feeder Loading Study

Circuit studies were performed to determine if there are any equipment overloads due to the proposed generating facilities. Loading was examined with the generator on line for normal operating conditions. This study assumes normal operating conditions and base case data.

**Table 3.B - Device Loading**

| Device Loading (kW) | Case 1 | Case 2 |
|---|---|---|
| **Project OFF Line** | **(kW)** | **(kW)** |
| **CB 1104/2** | 6603 | 1750 |
| **SW 81591** | 3164 | 846 |
| **PCC** | 1660 | 445 |
| **Project ON Line** | | |
| **CB 1104/2** | 3814 | -985 |
| **SW 81591** | 419 | -1889 |
| **PCC** | -1082 | -2293 |

Based on feeder loading studies resulted, the interconnection of 2,760 kW of generation onto the Malaga 1102 circuit would cause a reverse power flow back toward Malaga 1102 circuit breaker and its line equipment. The normal capacity for the circuit breaker and its line equipment can handle this reverse power flow. Thus additional work is not required.

**No Mitigations Required:**

**PASS Screen N**

## 3.2 Screen O – Power Quality and Voltage Tests

### 3.2.1 Steady State Voltage

Malaga 1102 (254251102) has no source of line voltage regulation between the substation and the proposed generation site. Bank 3 at Malaga Substation has a load tap changer that regulates the feeder voltages. The addition of the Project will offset some load measured by the Bank 3 Regulator, causing output voltage to be lower than without the generation online.

Analysis was performed to determine if the Project causes any steady state voltage problems where the primary voltage is out of tolerance from Rule 2 Standards. Steady state voltage was examined with the generator off-line and on-line for the different system operating conditions.

**Table 3.C - Steady State Voltage before Mitigation**

| Voltage on 120V Base | Case 1 | | | Case 2 | | |
|---|---|---|---|---|---|---|
| | MAX | MIN | PCC | MAX | MIN | PCC |
| **Project Off-Line** | | | | | | |
| **1104 (V)** | 125.8 | 122.7 | 125.0 | 121.8 | 120.2 | 120.4 |
| **Project On-Line** | | | | | | |
| **1104 (V)** | 126.3 | 122.7 | 125.5 | 122.5 | 120.2 | 120.7 |

Analysis has shown that the desensitization of the Malaga Bank 3 LTC by the interconnection of 2,760 kW of generation will not cause voltage conditions outside of Rule 2 limits.

**No Mitigations Required**

### 3.2.2 Fluctuating Voltage

In general, voltage flicker with regards to large scale distributed generation installations is defined as the change in the voltage at the Point of Common Coupling (PCC) due to a sudden change in current acting across impedance:

PG&E and the California Public Utilities Commission (CPUC) require that voltage flicker on the distribution system be restricted to three volts or less on a 120 volt base. This limit may be increased to five volts if the circuit/substation is very rural or industrial in nature. The five volts limit will be used for this study. Studies were performed to determine if the voltage flicker caused by the proposed generating facility exceeds this limit.

The voltage flicker due to the Project was calculated by comparing the steady state voltage with generation on-line and the voltage of the circuit immediately after the generator trips off-line but before the voltage regulation equipment can react.

**Table 3.D - Calculated Fluctuation**

| Power Factor | | MVA | | | | |
|---|---|---|---|---|---|---|
| | | 2.76 | 2.07 | 1.84 | 1.38 | 0.69 |
| Lagging | 0.90 | 3.39 | 2.54 | 2.26 | 1.70 | 0.85 |
| | 0.93 | 3.03 | 2.27 | 2.02 | 1.52 | 0.76 |
| | 0.95 | 2.74 | 2.05 | 1.82 | 1.37 | 0.68 |
| | 0.99 | 1.80 | 1.35 | 1.20 | 0.90 | 0.45 |
| Unity | 1.00 | 1.01 | 0.76 | 0.67 | 0.50 | 0.25 |
| Leading | -0.99 | 0.19 | 0.15 | 0.13 | 0.10 | 0.05 |
| | -0.95 | 0.82 | 0.62 | 0.55 | 0.41 | 0.21 |
| | -0.93 | 1.16 | 0.87 | 0.77 | 0.58 | 0.29 |
| | -0.90 | 1.58 | 1.18 | 1.05 | 0.79 | 0.39 |

**Table 3.E - Simulated Fluctuation before Mitigations**

| Voltage @ 120V Base | Case 1 | Case 2 |
|---|---|---|
| On Line | 125.5 | 120.7 |
| Off Line | 124.6 | 120.0 |
| ΔV | 0.9 | 0.7 |

Analysis of this section has determined that there will be no significant impacts to the system when the project goes online. No mitigation will be needed for this section.

**No Mitigations Required**

**PASS Screen O**

## 3.3 Screen P – Safety and Reliability Tests

The major protection items are identified are detailed below. These would be required to be installed by PG&E as Special Facilities for the Interconnection Customer's proposed generation.

Per Section G2.1 of the PG&E Transmission Interconnection Handbook, PG&E protection requirements are designed and intended to protect the PG&E power system only. As a general rule, neither party should depend on the other for the protection of its own equipment.

Refer to PG&E's Generation Interconnection handbook for full requirements.

**DIH:** http://www.pge.com/b2b/newgenerator/distributedgeneration/interconnectionhandbook/
**TIH:** http://www.pge.com/mybusiness/customerservice/nonpgeutility/electrictransmission/tariffs/handbook/

### 3.3.1 Protection Settings and Overstressed Equipment

Short circuit studies were performed to determine the effect of the Project on short-circuits fault duties and impact on the existing distribution system. The fault duties were calculated before and after the Generating Facility Interconnection.

**Table 3.F - Short Circuit Contribution**

| Fault Contribution (Primary Amps) | Project OFF Line | | | Project ON Line | | |
|---|---|---|---|---|---|---|
| | L-G | L-L | L-L-L | L-G | L-L | L-L-L |
| **Bus Fault** | | | | | | |
| **PG&E** | 7457 | 8437 | 9742 | 7448 | 8439 | 9742 |
| **Ref 1788-RD** | 0 | 0 | 0 | 24 | 71 | 143 |
| **Total Fault Duty** | 7457 | 8437 | 9742 | **7472** | **8499** | **9885** |
| **PCC Fault** | | | | | | |
| **PG&E** | 1351 | 2295 | 2650 | 1340 | 2301 | 2650 |
| **Ref 1788-RD** | 0 | 0 | 0 | 24 | 72 | 149 |
| **Total Fault Duty** | 1351 | 2295 | 2650 | **1363** | **2356** | **2796** |

Analysis of this section has determined that there will be no significant impacts to the system when the project goes online. No mitigation will be needed for section 3.3.1.

**No Mitigations**

### 3.3.2 Anti-Islanding

It is required that the generator trip off line within 2 seconds for the formation of an Unintended Island between the proposed generator and the automatic sectionalizing devices. The Project will be located beyond the following three-phase automatic protective devices:

**Table 3.G - Anti-Islanding**

| Device | Min. Load at Device (kW) | Exisitng Generation (kW) | Queued Generation (kW) | Project Generation (kW) | Aggregate Generation (kW) | Generation to Load Ratio (%) | Machine to PV Ratio (%) |
|---|---|---|---|---|---|---|---|
| Bank 3 | 15297 | 9010 | 792 | 2760 | 12562 | 82.1% | 1.0% |
| CB 1102/2 | 3301 | 1526 | 100 | 2760 | 4386 | 132.9% | 2.8% |

The above table indicates that the project size is above 50% of the minimum load at **Malaga** 1102 circuit breaker and its line recloser. Since the existing generations on this circuit are certified inverter-based generation, only the following work is required.

**Mitigations Required**

- Place Malaga 1102/2 reclosing interval to 10 and 15 seconds

### 3.3.3 Generator's Fault Detection Requirements

The inverter-based interconnections typically do not contribute enough fault current to the phase faults on the PG&E circuit and it might not be possible for current-based fault detection schemes to detect the phase fault and operate. Therefore, in case of three-phase or line-to-line faults on the PG&E feeder the anti-islanding scheme on the Project's inverters might trip the respective inverter off line after the feeder circuit breaker opens in order to clear the fault. This scheme is considered to be acceptable for the phase fault detection if the customer's inverter system is certified per UL 1741 standard.

For the ground faults detection requirement, PG&E's 12 kV distribution system is a three-wire distribution circuit and does not have a current carrying neutral. Therefore, the generating facility should be connected to the distribution system using an effectively ungrounded connection system that does not contribute zero sequence current to the PG&E distribution system. The primary of the interconnection transformer for this generating station is delta winding as per the submitted information, which meets the said requirement. Since the existing generation beyond all the automatic protective devices is certified inverter-based generation, ground faults detection scheme is not required.

**No Mitigations Required**

PG&E's protection requirements are designed and intended to protect the PG&E power system only. Refer to "*PG&E's Generation Interconnection Handbook"* for the full requirements.

**PASS Screen P**

## 4. Interconnections Facility Requirements

DG Customer will tie to existing Service located at meter number 1010019100. The scope of the work required on-site will include the following:

1. **Dedicated Transformer**
   A dedicated transformer is required to step-up the generator voltage to the interconnection level and isolates the Generation Entity from other customers. The impedance of the a dedicated transformer limits fault currents on the generator bus from the PG&E Power System and also limits fault currents on the PG&E Power System from the generation. Hence, it reduces the potential damage to both parties due to faults. Proposed 3000kVA transformer meet this requirement.

2. **Gang-Operated Disconnect Switch**
   A disconnect switch can be located on either the PG&E's side or customer's side of interconnection point. The switch must be gang operated and have a visible open point (air gap, visible either through a viewing window or an operable door). PG&E operating personnel must be able to independently operate the switch and lock it in the open position. This switch will be the PG&E operable disconnect point for the Generating Facility.

3. **Frequency and Voltage Protection**
   A certified inverter will meet the frequency and voltage protection requirement. Otherwise, switchgear for Generating Facility interconnections must include over-frequency and under-frequency relays (ANSI device number 81O/U) and overvoltage and under-voltage relays (device numbers 59 and 27). These relays must be approved by PG&E as specified above and must be redundant; the relay functions can be provided by multi-function relays installed to provide over-current protection. The standard settings for distribution interconnections are as follows:

   **Under-voltage (27)**: the generating facility must initiate trip in not longer than 10 cycles for voltages below 50% of nominal voltage and not longer than 120 cycles (2 seconds) for voltages below 88% of nominal voltage.

   **Overvoltage (59)**: the generating facility must initiate trip in not longer than 10 cycles for voltages above 120% of nominal voltage and not longer than 60 cycles (1 second) for voltages above 110% of nominal voltage.

   **Over-frequency/Under-frequency (81O/U)**: the generating facility must initiate trip in not longer than 10 cycles for frequencies below 59.3 Hz and must initiate trip in not longer than 10 cycles for frequencies above 60.5 Hz.

## 5. Revenue Metering and Telemetry

PG&E requires revenue metering at the PCC.

The generating facility nameplate rating will be at least 1MW. **A PG&E SCADA communication scheme will be required to monitor the export of the generating facility at the point of interconnection.**

**Mitigations Required**

- Install SCADA mini-RTU Mode 2 at the PCC

## 6. Pre-parallel Inspection Requirements

**Please note upon notification of the generator(s) readiness for the pre-parallel inspection, it can take up to 30 days for the pre-parallel inspection due to available resources. The following items must be completed prior to the scheduling of the inspection:**

- All required agreements executed.
- There must be an accessible, visible and lockable disconnect switch. (This must be shown on the single line drawing. Include manufacturer name and model number.)
- Breakers should be shunt trip from a battery in accordance with the attached criteria. (This requirement must be shown in the three line drawings. Include manufacturer name, size and model number.) Not Require
- A copy of the final signed building permit from the local authority having jurisdiction over the installation of the co-generation system is provided.
- If required, all electric work by PG&E completed.
- If required, gas service/meter (PG&E owned) installation completed.

**Once the inspection is scheduled, our Station Test Department requires the following information be provided a minimum of 15 days prior to the inspection:**

- Single line and three line relay drawings approved. (An electronic version is preferred.)
- The G5-1 Form completed and returned electronically. (Will be provided)
- Basic Info Requirement Form completed and returned electronically. (Not Require)
- Field "bench test" of relays approved. (Not Require)
- Battery Discharge Test Report and Commissioning Test Checklist. (Not Require)

## 7. Cost Estimates

The detailed estimation of costs below includes interconnection and/or system upgrades required to interconnect the Project to PG&E's distribution system, but does not include any in-plant facilities constructed, owned and operated by the Applicant. The below costs are only estimates using average cost without actual field verification.

| Distribution Upgrades | IC Costs | PG&E Costs |
|---|---|---|
| **Malaga Bank 3** | | |
| None | | |
| | | |
| **Malaga 1102 Circuit** | | |
| Place 1102/2 reclosing interval to 10 and 25 seconds | | $2,500.00 |
| | | |
| | | |
| **Distribution Upgrades Subtotal** | | $2,500.00 |

| Interconnection Upgrades | IC Costs | PG&E Costs |
|---|---|---|
| **Generating Facility** | | |
| First Pre-parallel inspection and testing witnessing | | $1,000.00 |
| Install SCADA mini-RTU Mode 2 at the PCC | $50,000.00 | |
| Upgrade existing PG&E revenue metering (Meter 1010019100) | $5,000.00 | |
| Existing PG&E Primary Service | N/A | |
| Install visible open switch at POI (to be installed by IC) | N/A | |
| | | |
| **Interconnection Upgrades Subtotal** | $55,000.00 | $1,000.00 |

| Total Project Costs | IC Costs | PG&E Costs |
|---|---|---|
| **Total Project Cost (excludes COO)** | $55,000.00 | $3,500.00 |
| Total ITCC[2] | $13,200.00 | |
| *One-Time COO ($55,000 x 0.53% x14.20 x 12)* | *$49,671.60* | |

[2] Not subject to ITCC on contribution. ITCC is exempt for wholesale generators that meet the IRS Safe Harbor Provisions. PG&E currently does not require the Interconnection Customer to provide security to cover the potential tax liability on the Interconnection Facilities, Distribution Upgrades, and Network Upgrades per the IRS Safe Harbor Provisions (IRS Notice 88-129). PG&E reserves the right to require, on a nondiscriminatory basis, the Interconnection Customer to provide such security, in a form reasonably acceptable to PG&E as indicated in Article 11 of the SGIA, an amount up to the cost consequences of any current tax liability. Upon request and within sixty (60) Calendar Days' notice, the Interconnection Customer shall provide PG&E such ITCC security or ITCC payment in the event that Safe Harbor Provisions have not been met, in the form requested by PG&E.

# 8. Requirements Prior to Pre-parallel Inspection and Operation

## 8.1 PG&E System Work

**The following is the required work on the PG&E System prior to the pre-parallel inspection:**

1. Place Malaga 1102/2 reclosing interval to 10 and 15 seconds

## 8.2 Interconnection Facility Work

**The following is the required work for the interconnection facilities prior to the pre-parallel inspection:**

1. Applicant is to provide an approved PG&E switch that is accessible, lockable, and gang-operated beyond the meter at the PCC
2. Upgrade existing PG&E revenue meter
3. Install SCADA Mini-RTU Mode 2 at the PCC

## 8.3 Required Documentation

**The following is the required work prior to the pre-parallel inspection:**

1. Approval of operation and control sequence descriptions (function description)
2. Pre-parallel inspection as specific in Section 6 if applicable
3. Execution of the operating agreement
4. All the required upgrades are completed

## 8.4 Parallel Operation Requirements

**In order to release this project for parallel operation with the PG&E distribution system, the following tasks are required**:

1. Approval of the customer's 3-line wiring diagrams, control and relay diagrams
2. Approval of operation and control sequence descriptions (function description)
3. Pre-parallel inspection as specific in Section 6 if applicable
4. Execution of the operating agreement
5. All the required upgrades are completed

## 8.5 Operational Requirements

County of Fresno ability to operate the generating facilities at the 3333 E American Avenue, Fresno, California 93725 is guaranteed only when the PG&E system is in the normal operating configuration and all required protection and regulation equipment is operational. PG&E reserves the right to require the County of Fresno (Juvenile Hall) generations to separate from the PG&E system if required for safety or system stability during an abnormal condition. In particular, the County of Fresno (Juvenile Hall) generator will not be allowed to operate in parallel with PG&E if the PG&E circuit source feeding the plant is switched to a source configuration different from that shown in Figure 2 above.

## Signage Required at AC Disconnect Location

**PG&E LOCKABLE VISIBLE GENERATOR DISCONNECT SWITCH**

**Note: Sign will be permanent and will have a white background with 1½ inch red lettering.**

**This sign should be attached to the Disconnect itself; copies should be attached to any gates or doors which will be used by PG&E personnel to access the disconnect switch.**

**WARNING GENERATOR INSTALLED ON PREMISES**

**POSSIBLE DANGER OF ELECTRICAL BACKFEED**

**CHECK INSTALLATION BEFORE PERFORMING ANY WORK**

**DISCONNECT SWITCH IS LOCATED *<SPECIFIC LOCATION>***

**Note: Sign will be permanent and will have a white background with ½ inch red lettering.**

**This sign should be located on or near the Main Utility Breaker; a copy should be attached to the Electrical Room door if the Main Utility Breaker is located indoors.**

**For interconnections using multiple generator disconnects, include the following text above the disconnect locations: "THIS SYSTEM HAS *[n]* GENERATOR DISCONNECTS. *[BOTH/ALL n]* DISCONNECTS MUST BE OPENED TO ISOLATE THE SYSTEM."**

**Where the disconnect location is distant from the Main Breaker or the route to the disconnect is complex, include a site plan showing the disconnect location on permanent material.**