



**Pacific Gas and
Electric Company**

Electric T&D Capacity, Reliability, UG Asset Bulletin

Title: Secondary Spot Network System Requirements for Distributed Generation Interconnection

Check all appropriate boxes

- | | | | |
|---|--|--|---|
| <input type="checkbox"/> SAFETY ALERT | <input type="checkbox"/> GAS | <input checked="" type="checkbox"/> DISTRIBUTION | <input type="checkbox"/> SUBSTATION ENGR. |
| <input type="checkbox"/> MANDATORY COMPLIANCE | <input checked="" type="checkbox"/> ELECTRIC | <input type="checkbox"/> TRANSMISSION | <input type="checkbox"/> TRANS./SUB. M&C |
| <input type="checkbox"/> RECOMMENDED ACTIONS | <input type="checkbox"/> ESTIMATING | <input type="checkbox"/> OPERATIONS | <input type="checkbox"/> APPLICANT DESIGNER /
CONSTRUCTION |
| <input checked="" type="checkbox"/> INFORMATIONAL/CLARIFICATION | <input type="checkbox"/> MAPPING | <input type="checkbox"/> SERVICE | |

Goal:

To provide safe and reliable operation, the requirements in this bulletin are necessary for any new distributed generators (DG) that are interconnected to the PG&E's Secondary Spot Network System.

Process:

The following requirements shall apply to all new interconnection of the Distributed Generation (DG) to PG&E's Secondary Spot Network:

1. All of the network protectors on the Secondary Spot Network shall be replaced with Cutler Hammer CM52 network protectors equipped with MPCV relays.
2. Older style protectors (CM-22, MG-8, and CMD) may remain, provided that the network protector relays are replaced with MPCV relays or other PG&E-approved relays, capable of at least 2 set points, one with a time delay, and shall meet the following conditions:
 - (a) The Generator(s) plus the associated bus and/or cable to the main switch has a transient and sub-transient X/R ratio of nine (9) or less for all operating scenarios;
 - (b) Synchronization of each generator shall be supervised by a PG&E-approved Sync Check relay;
 - (c) In non-fault conditions, the generator breaker must operate in 1.5 minutes or less;
 - (d) Breakers separating all generation must open immediately without any intentional time delay under system fault conditions

3. Division's Planning Engineer shall review network protector relays on the adjacent lines for relay coordination. If relay coordination's are inadequate, the old relays will be required to be replaced.
4. DG Producer will provide all necessary technical requirements as specified in Rule 21, including the protective device settings and frequency/voltage settings.
5. DG Producer will meet the minimum import requirements set forth below:

- (a) The DG(may not operate Parallel Operation unless a minimum number of network protectors are closed. The DG must trip instantaneously when the number of closed network protectors falls below the following the value [select appropriate value from this table]:

Quantity of Network Protectors in Vault	Minimum Number of Closed Protectors Required in Order for DG to Operate
2	2
3	2
4	2
5	3

When the number of closed protectors drops to 50% or lower then the generator must instantaneously trip.

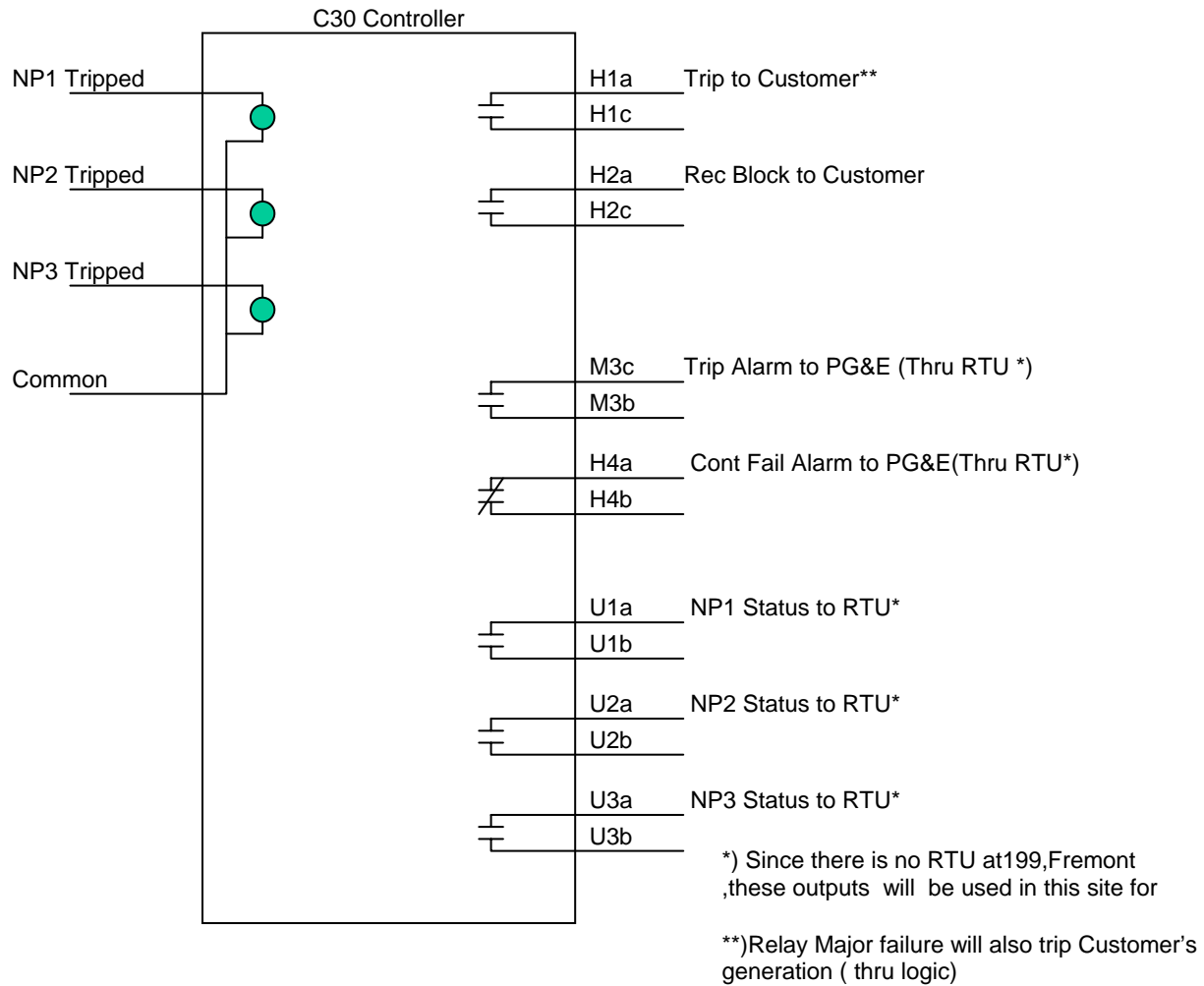
- (b) **A minimum import setting of ten percent (10%) of the nameplate rating of the largest single network transformer** serving the PG&E secondary spot network bus where the DG is installed. Minimum import protection to be accomplished using a redundant PG&E-approved underpower (Device 37) relay or reversed power flow relay (Device 32). A meter with kVA summation of multiple services from the spot network bus is allowed on the common spot network bus through one or more Generators. If PG&E's meters do not support summation and protection requirements, DG Producer shall be responsible for the cost of providing meters capable of supporting summation. If the minimum import is not met, the Generator(s) must trip within 15 cycles to ensure that the Generator(s) trip prior to the network protectors. Redundant protection of the net import minimum power must be provided.

- (c) A contact must be available on the existing network protectors to provide open/close status to the DG Producer's trip devices via a GE C-30 controller or PG&E approved controller. The cost for controller along with the installation and operating and maintenance costs of the relay/controller will be borne by the DG Producer. The DG Producer shall install and terminate rigid grounded 2-inch conduit, and a pair of wires from the trip device to inside the transformer vault. The location of conduit core shall be reviewed and approved by PG&E.

- (d) DG Producer will provide 24VDC source from their battery with charging system for GE C-30 controller or PG&E approved controller.

- (e) PG&E will do the installation of GE C-30 relay/controller or PG&E approved controller in the property owner's transformer vault. See attached schematic.

Schematic for GE C-30:



Understanding:

This bulletin is written based on technical training provided by Dave Smith (Power Technologies Inc) during October 2003. PG&E will use this bulletin as requirements for all DG that are to be interconnected to Secondary Spot Network.

This bulletin will be reviewed and revised if these requirements are still not adequate.

Approved by:

Dan Pearson, Manager, T&D Capacity, Reliability, & UG Assets

Date: 11/01/04

If you have any questions about this bulletin, please call the employee(s) listed below:

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