PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

July 5, 2013

Advice Letter 4233-E

Brian K. Cherry
Vice President, Regulation and Rates
Pacific Gas and Electric Company
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, CA 94177

Subject: Modifications to Electric Rule 21 Forms 79-974 and 79-1145 to Allow for Online Submission

Dear Mr. Cherry:

Advice Letter 4233-E is effective June 30, 2013.

Sincerely,

Edward Randolph

Edward F. Randolph, Director
Energy Division

Pacific Gas and Electric Company

Brian K. Cherry
Vice President
Regulatory Relations

Pacific Gas and Electric Company
77 Beale St., Mail Code B10C
P.O. Box 770000
San Francisco, CA 94177

Fax: 415.973.7226

May 31, 2013

Advice 4233-E
(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

Subject: **Modifications to Electric Rule 21 Forms 79-974 and 79-1145 to Allow for Online Submission**

Purpose

Pacific Gas and Electric Company (PG&E) hereby seeks approval for modifications to Electric Rule 21 Forms 79-974 -- *Generating Facility Interconnection Application For Non-Export or Certain Net Energy Metered Generating Facilities (Between 30 kW AND 1,000 kW)* -- and 79-1145 -- *Rule 21 Exporting Generator Interconnection Request*—to allow for online submission and to better support certain net energy metering and RES-BCT project applications.

Background

In order to improve the turnaround time for new PG&E Rule 21 interconnection applications, and provide a better applicant interconnection experience, PG&E is seeking to streamline and further refine two of its interconnection application form processes. The two forms, 79-974 and 79-1145, the subject of the advice letter, have traditionally been submitted by paper to PG&E. PG&E has now converted them both to online forms and seeks to revise the instructions in these two forms so that applicants will now routinely submit these forms online.

Generators enrolling in a number of programs including certain Schedule NEM options and Schedule RES-BCT, use application form 79-974. To enhance the processing of these projects, additional description input fields have been added as well.

Form Changes

1) Form 79-974 -- *Generating Facility Interconnection Application For Non-Export or Certain Net Energy Metered Generating Facilities (Between 30 kW AND 1,000 kW)* -- changes include the following:

a) In Part I, C, added a PG&E web-link that takes applicants to PG&E's online application page where further instructions for applying can be found along with the online application; removed the PG&E post office address; and included an email contact in case the applicant has any questions.

b) Added a fifth option to Part IV – Describing the Generating Facility and Host Customer's Electrical Facility -- Section C regarding parallel operation as follows:

The Generating Facility completely offset their facility load by being (a) optimally sized to meet their peak demand with load following functionality on the Generator controls and (b) ensuring conditional (inadvertent) export of electric power from the Generation Facility to Distribution Provider's Distribution or Transmission System occurs no more frequently than twice in any 24 hour period and the exports are greater than 2 seconds but no more than more than 60 seconds.

If this option is selected, you must also choose option 1 or 2.

c) Added a new option to Part IV, Section E regarding generating facility operation, as follows:

RES-BCT – Where the Generating Facility will be operated with no on-site electrical load (other than station load).

d) Added in Part IV on Page 11, in the table of instructions, three new rows of instructions to allow for an AC (Alternating Current) disconnect description, photovoltaic (PV) panel description, and an line-side tap description; Added in Part V, instructions for completing the three new rows added in Part IV.

e) Corrected the section designations within Parts IV and V to make them sequential.

2) Form 79-1145 – *Rule 21 Exporting Generator Interconnection Request* -- changes include the following:

a) In section 6, added a PG&E web-link that takes applicants to PG&E's online application page where further instructions for applying can be found along with the online application; removed the PG&E post office address; and included an email contact is in case the applicant has any questions.

Protests

Anyone wishing to protest this filing may do so by letter sent via U.S. mail, by facsimile or electronically, any of which must be received no later than June 20, 2013, which is 20 days after the date of this filing. Protests should be mailed to:

CPUC Energy Division
ED Tariff Unit
505 Van Ness Avenue, 4th Floor
San Francisco, California 94102

Facsimile: (415) 703-2200
E-mail: EDTariffUnit@cpuc.ca.gov

Copies of protests also should be mailed to the attention of the Director, Energy Division, Room 4004, at the address shown above.

The protest shall also be sent to PG&E either via E-mail, or U.S. mail (and by facsimile, if possible) at the address shown below on the same date it is mailed or delivered to the Commission:

Brian K. Cherry
Vice President, Regulatory Relations
Pacific Gas and Electric Company
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, California 94177

Facsimile: (415) 973-7226
E-mail: PGETariffs@pge.com

Any person (including individuals, groups, or organizations) may protest or respond to an advice letter. (General Order 96-B, Rule 7.4.) The protest shall contain the following information: specification of the advice letter protested; grounds for the protest; supporting factual information or legal argument; name, telephone number, postal address, and (where appropriate) e-mail address of the protestant; and statement that the protest was sent to the utility no later than the day on which the protest was submitted to the reviewing Industry Division (General Order 96-B, Rule 3.11).

Effective Date

PG&E requests that this Tier 2 advice filing become effective on regular notice, June 30, 2013, which is 30 calendar days after the date of filing.

Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically and via U.S. mail to parties shown on the parties on the service list for R.12-11-005 and R.11-09-011. Address changes to the General Order 96-B service list should be directed to PG&E at email address PGETariffs@pge.com. For changes to any other service list, please contact the Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov. Send all electronic approvals to PGETariffs@pge.com. Advice letter filings can also be accessed electronically at: http://www.pge.com/tariffs.

Brian Cherry /IG

Vice President, Regulatory Relations

Attachments

cc: Service Lists R.12-11-005 and R.11-09-011
Jamie Ormond – Energy Division

CALIFORNIA PUBLIC UTILITIES COMMISSION

ADVICE LETTER FILING SUMMARY
ENERGY UTILITY

MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No. **Pacific Gas and Electric Company (ID U39 E)**

Utility type:	Contact Person: Igor Grinberg
☑ ELC ☐ GAS	Phone #: (415) 973-8580
☐ PLC ☐ HEAT ☐ WATER	E-mail: ixg8@pge.com and PGETariffs@pge.com

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas
PLC = Pipeline HEAT = Heat WATER = Water

(Date Filed/ Received Stamp by CPUC)

Advice Letter (AL) #: **4233-E** **Tier: 2**

Subject of AL: **Modifications to Electric Rule 21 Forms 79-974 and 79-1145 to Allow for Online Submission**

Keywords (choose from CPUC listing): Forms

AL filing type: ☐ Monthly ☐ Quarterly ☐ Annual ☑ One-Time ☐ Other _____

If AL filed in compliance with a Commission order, indicate relevant Decision/Resolution #: _____

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No

Summarize differences between the AL and the prior withdrawn or rejected AL: _____

Is AL requesting confidential treatment? If so, what information is the utility seeking confidential treatment for: N/A

Confidential information will be made available to those who have executed a nondisclosure agreement: ☐ Yes ☑ No

Name(s) and contact information of the person(s) who will provide the nondisclosure agreement and access to the confidential information: _____

Resolution Required? ☐Yes ☑No

Requested effective date: **June 30, 2013** No. of tariff sheets: N/A

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: Electric Forms 79-974 and 79-1145

Service affected and changes proposed: N/A

Pending advice letters that revise the same tariff sheets: N/A

Protests, dispositions, and all other correspondence regarding this AL are due no later than 20 days after the date of this filing, unless otherwise authorized by the Commission, and shall be sent to:

California Public Utilities Commission
Energy Division
EDTariffUnit
505 Van Ness Ave., 4th Flr.
San Francisco, CA 94102
E-mail: EDTariffUnit@cpuc.ca.gov

Pacific Gas and Electric Company
Attn: Brian Cherry
Vice President, Regulatory Relations
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, CA 94177
E-mail: PGETariffs@pge.com

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
32723-E	ELECTRIC SAMPLE FORM NO. 79-974 GENERATING FACILITY INTERCONNECTION APPLICATION FOR NON-EXPORT OR CERTAIN NET ENERGY METERED GENERATING FACILITIES (BETWEEN 30 KW AND 1,000 KW)	32038-E*
32724-E	ELECTRIC SAMPLE FORM 79-1145 Rule 21 Exporting Generator Interconnection Request Sheet 1	32052-E*
32725-E	ELECTRIC TABLE OF CONTENTS Sheet 1	32704-E
32726-E	ELECTRIC TABLE OF CONTENTS SAMPLE FORMS Sheet 25	32430-E

ELECTRIC SAMPLE FORM NO. 79-974
GENERATING FACILITY INTERCONNECTION APPLICATION
FOR NON-EXPORT OR CERTAIN NET ENERGY METERED GENERATING
FACILITIES (BETWEEN 30 KW AND 1,000 KW)

Please Refer to Attached
Sample Form

GENERATING FACILITY INTERCONNECTION APPLICATION FOR NON-EXPORT OR CERTAIN NET ENERGY METERED GENERATING FACILITIES (Between 30 KW and 1,000 KW)

Part I – Introduction and Overview

A. Applicability: This Generating Facility Interconnection Application (Application) is used to request the interconnection of a Non-Export or certain Net Energy Metered Generating Facility between 30 KW and 1,000 KW, to Pacific Gas and Electric Company's (PG&E) Distribution System (over which the California Public Utilities Commission (CPUC) has jurisdiction). Refer to PG&E's Rule 21 to determine the specific requirements for interconnecting a Generating Facility. Capitalized terms used in this Application, and not otherwise defined herein, shall have the same meanings as defined in PG&E's Rule 21 and Rule 1.

Except as noted in the next paragraph, this Application may be used for any Generating Facility to be operated by, or for, a Customer and/or Producer to supplement or serve part or all of its electric energy requirements that would otherwise be provided by PG&E, including distributed generation, cogeneration, emergency, backup, standby generation, and certain Net Energy Metered Generating Facilities. A simpler, shorter form is also available from PG&E for Net Energy Metering Customers with Solar and/or Wind Electric Generating Facilities less than 30kW (Form 79-1101). This form is available on PG&E's website at http://www.pge.com/gen. While Customers operating Generating Facilities isolated from PG&E's Distribution System are not obligated to enter into an Interconnection Agreement with PG&E, parts of this Application will still need to be completed to satisfy PG&E's notice requirements for operating an isolated Generating Facility as specified in the California Health and Safety Code Section 119085 (b).

This Application may not be used to apply for interconnecting Generating Facilities used to participate in transactions where all, or a portion of, the electrical output of the Generating Facility is scheduled with the California Independent System Operator. Such transactions may be subject to the jurisdiction of the Federal Energy Regulatory Commission (FERC) and require a different application available from PG&E.

This Application is not applicable for incentives and/or rebates offered by the Energy Resources Conservation and Development Commission (CEC) or the CPUC. Please contact those agencies directly or on their respective websites (www.energy.state.ca.us and www.cpuc.ca.gov).

Guidelines and Steps for Interconnection: This Application must be completed and sent to PG&E along with the additional information indicated in Part 1, Section C below to initiate PG&E's interconnection review of the proposed Generating Facility. When applicable per Rule 21, a non-refundable $800 Interconnection Request fee shall be invoiced and must be paid by Applicant. Pursuant to PG&E's Rule 21, there may be additional study and other costs; see PG&E's Rule 21, Sections E.2.c and E.3., for more information regarding interconnection of a generator to PG&E's Distribution System.

This document is only an Application. Upon acceptance of the Generating Facilities, PG&E will prepare an Interconnection Agreement for execution by the Producer, the party that will be responsible for the Generating Facility. PG&E may also require an inspection and testing of the Generating Facility and installation of any related Interconnection Facilities prior to giving the Producer written authorization to operate in parallel. **Unauthorized Parallel Operation may be dangerous and may result in injury to persons and/or may cause damage to equipment and/or property for which a Producer/Customer may be liable!**

Please note, other approvals may need to be acquired, and/or other agreements may need to be formed with PG&E or regulatory agencies, such as the Air Quality Management Districts and local governmental building and planning commissions, prior to operating a Generating Facility. PG&E's authorization to operate in parallel does not satisfy the need for an Applicant to acquire such other approvals.

B. Required Documents: Each of the following documents **are required to be submitted** before this application will be processed. Drawings must conform to accepted engineering standards and must be legible. Electronic documents are preferred.

1. A **Single-line drawing** showing the electrical relationship and descriptions of the significant electrical components such as the primary switchgear, secondary switchboard, protective relays, transformers, generators, circuit breakers, with operating voltages, capacities, and protective functions of the Generating Facility, the Customer's loads, and the interconnection with PG&E's Distribution System. Please show the location of all required net generation electric output meter(s) and the A.C. manual operated disconnect switch on the single line drawing, when required.
2. **Site plans and diagrams** showing the physical relationship of the significant electrical components of the Generating Facility such as generators, transformers, primary switchgear/secondary switchboard, and control panels, the Customer's loads and the interconnection with PG&E's Distribution System. Please show the location of all required net generation electric output meter(s) and the A.C. manual operated disconnect switch on the site plans, when required.
3. If transformers are used to interconnect the Generating Facility with PG&E's Distribution System, please provide **transformer nameplate information** (voltages, capacity, winding arrangements, connections, impedance, et cetera).
4. If a **transfer switch** or scheme is used to interconnect the Generating Facility with PG&E Distribution System, please provide component descriptions, capacity ratings, and a technical description of how the transfer scheme is intended to operate.
5. If **protective relays** are used to control the interconnection, provide protection diagrams or elementary drawings showing relay wiring and connections, proposed relay settings, and a description of how the protection scheme is intended to function.

6. A **non-refundable $800 Interconnection Request fee** shall be invoiced and required, when applicable per Rule 21.

C. Application Instructions: Complete this application and enter this information into PG&E's web-based form. (PG&E strongly recommends preparing all information and materials before starting the online application.) The online web-based from can be found at:

http://www.pge.com/mybusiness/customerservice/nonpgeutility/generateownpower/distributedgeneration/generationrule21/

Questions concerning PG&E's Online Application process can be directed to the Electric Generation Interconnection Department at rule21gen@pge.com.

Part II Selecting the Study Process[1]

Please check one:

- ❑ Fast Track Process.
- ❑ Detailed Study (not typical)
  - Will be either an Independent Study Process, Distribution Group Study Process or Transmission Cluster Study Process, dependent upon the Electrical Independence Tests.

Part III– Identifying the Generating Facility Location and Responsible Parties

Project Name:	*Date Received:*	*Generating Facility ID:*	*Application Expiration Date (Refer to Part III, Section E)*

(For PG&E Use Only)

A. Customer Electric Account Information (What electric service will the Generating Facility be interconnected for parallel operation with PG&E? For aggregated electric accounts (under NEMBIO, dairy operations only) provide the primary and all associated accounts/meter information).

Name shown on PG&E service account	Electric Service Agreement ID number	Electric Badge (Meter) Number

NOTE: Customer Electric account must match the customer's utility bill account information.

Meter Location Street Address	City	State	Zip

Part III Cont'd – Identifying the Generating Facility Location and Responsible Parties

[1] For selection of Study Process for Exporting Generating Facilities, please complete the Rule 21 Exporting Generating Facility Interconnection Request Form 79-1145.

Pacific Gas and Electric Company

GENERATING FACILITY INTERCONNECTION APPLICATION FOR NON-EXPORT OR CERTAIN NET ENERGY METERED GENERATING FACILITIES (Between 30 KW and 1,000 KW)

Please check all that apply:

- ❑ A New Generating Facility interconnection (at an existing service).
- ❑ Physical Changes to an interconnected Generating Facility with previous approval by PG&E (adding PV panels, changing inverters/turbines or changing load and/or operations).
- ❑ A New interconnection in conjunction with a new service.
  - An **Application for Service** must be completed. Additional fees may be required if a service or line extension is required (in accordance with PG&E Electric Rules 15 and 16). Please contact PG&E at 1-800-PGE-5000.
- ❑ An Interconnection under Direct Access (DA).
  - Customers applying for interconnection who are served under Direct Access by an Energy Service Provider (ESP) must contact their ESP directly for information regarding the options available under their Direct Access contract.
- ❑ An Interconnection under Community Choice Aggregation Service (CCA Service).
  - Customers applying for interconnection who are served under Community Choice Aggregation Service (CCA Service) by a Community Choice Aggregator (CCA) must contact their CCA directly for information regarding the options available under their CCA Service Program.
- ❑ An interconnected non-exporting Generating Facility (load always exceeds generation).

Customer Electric Account Contact Information
(Who is the customer contact for progress updates and/or additional information?)

Contact Person	Company Name

Phone	Fax	E-mail

Mailing Address	City	State	Zip

B. Project Contact Information (Who is the project manager for this Generating Facility?)

Project Contact Person (Optional)	Company Name

Phone	Fax	E-mail

Mailing Address	City	State	Zip

B.1. Will the Generating Facility be owned by a (third) party other than the name appearing on the PG&E service account in A. above (please check)? _____ Yes _____No

Part III Cont'd – Identifying the Generating Facility Location and Responsible Parties

C.1. Customer-Generating Facility Interconnection Agreement (GFIA) or Customer Generation Agreement (CGA) (for 3rd Party Generator on Premises) Information (Please identify the party that will execute the applicable agreement). CGA is not applicable to Net Energy Metering (NEM) Applicants because PG&E and the Customer, not the 3rd Party if any, must enter into the Net Energy Metering Interconnection Agreement.

Company Name to be entered on GFIA/CGA	Legal Title of Host Facility to be entered on GFIA/CGA
Person Executing the GFIA/CGA	**Title of Person Executing the GFIA/CGA**

Mailing Address	**Phone**	**E-Mail**

C.2. 3rd Party Owner – GFIA Information (Please identify the Party, if known, that will execute the GFIA). This Section is not applicable to Net Energy Metering (NEM) Applicants because PG&E and the Customer, not the 3rd Party if any, must enter into the Net Energy Metering Interconnection Agreement.

Company Name to be entered on GFIA/CGA	Legal Title of Company to be entered on GFIA/CGA
Person Executing the GFIA	**Title of Person Executing GFIA**

Mailing Address	**Phone**	**E-Mail**

D. Operating Date (What date is this Generating Facility expected to begin operation?)

E. Expiration Date* (The date the status of this Application is changed to "withdrawn" by PG&E?)

- **The information submitted in this Application will remain active and valid consistent with the timelines specified in Rule 21.f.**

Pacific Gas and Electric Company

GENERATING FACILITY INTERCONNECTION APPLICATION FOR NON-EXPORT OR CERTAIN NET ENERGY METERED GENERATING FACILITIES (Between 30 KW and 1,000 KW)

Part IV - Describing the Generating Facility and Host Customer's Electrical Facilities

A. (MP&I)	Indicate the operating mode of the Generating Facility	operating mode options: __1 __2 __3 __4 (Choose one)

Instructions and Notes

Choose from the following operating mode options:

1. **Parallel Operation:** The Generating Facility will interconnect and operate "in parallel" with PG&E's Distribution System for more than one (1) second.
2. **Inadvertent Export:** The Generating Facility will interconnect and operate, providing unscheduled and uncompensated export of real power for a duration exceeding two (2) seconds but fewer than sixty (60) seconds. The expected frequency of "inadvertent export" occurrences should be less than two occurrences per 24-hour period. Protective Functions, technical requirements and operational limitations are described in Rule 21, Section M, Appendix One.
3. **Momentary Parallel Operation (MP):** The Generating Facility will interconnect and operate on a "momentary parallel" basis with PG&E's Distribution System for a duration of one (1) second or less through transfer switches or operating schemes specifically designed and engineered for such operation.
4. **Isolated Operation (I):** The Generating Facility will be "isolated" and prevented from becoming interconnected with PG&E's Distribution System through a transfer switch or operating scheme specifically designed and engineered for such operation.

If the answer is operating mode option 1, "parallel operation," please supply all of the information requested for the Generating Facility. Be sure to supply adequate information including diagrams and written descriptions regarding the protective relays that will be used to detect faults or abnormal operating conditions on PG&E's Distribution System.

If the answer is operating mode option 2 or 3, "momentary parallel operation" or "inadvertent export," only questions A, E and F of this Part IV and questions A, B, E, F, I, L, M, N, and S of Part V need be answered. Be sure, however, to supply adequate information including diagrams and written descriptions regarding the switching device or scheme that will be used to limit the parallel operation period to one second or less. Please also describe the back up or protective device and controls that will trip the Generating Facility should the transfer switch or scheme not complete the transfer in one second or less.

If the answer is operating mode option 4, "isolated operation," only questions A, E, and F of this Part IV and questions A, B, F, and S of Part V need be answered. Be sure, however, to supply adequate information including diagrams and written descriptions regarding the isolating switching device or scheme that will be used to prevent the Generating Facility from operating in parallel with PG&E's Distribution System.

B. *Parallel Operation Applications Only*	If the Answer to Section A above was operating mode option 1, please indicate the type of agreement that is being requested with this Application. If operating mode option 2, 3 or 4 was selected, please skip to questions E and F. If Agreement options 2, 3, 5, 7, 8, or 9 to this Section B are chosen, please provide an estimate of the maximum kW the Generating Facility is expected to export to PG&E's Distribution System. If PG&E determines that the amount of power to be exported is significant in relation to the capacity available on its Distribution System, it may request additional information, including time of delivery or seasonal kW/kWh estimates.	**agreement options:** __1 __2 __3 __4 __5 __6 __7 __8 __9 (Choose all that apply) _____ Maximum kW

Part IV Cont'd - Describing the Generating Facility and Host Customer's Electrical Facilities

Instructions and Notes

Sample agreements are available from PG&E for review. Choose from the following eight (8) agreement options:

Customer Owned Generating Facility (non-NEM)

1. **A Generating Facility Interconnection Agreement** that provides for parallel operation of the Generating Facility, but does not provide for exporting power to PG&E's Distribution System. This non-export agreement, however does allow the occasional and uncompensated export of energy to PG&E's Distribution System for less than 2 seconds in duration.
2. **A Generating Facility Interconnection Export Addendum** that provides for parallel operation of the Generating Facility and the **occasional, continuous, non-compensated, export of generator facilities sized 2 MW or less** to PG&E's Distribution System. Continuous export is export greater than 60 seconds in duration. This addendum must be executed in concert with Agreement 1.
3. **A Generating Facility Interconnection Agreement** that provides for parallel operation of the 3rd Party owned Generating Facility, but does not provide for exporting energy to PG&E's Distribution System. This agreement must be executed in addition to agreement 4.
4. **A Customer Generation Agreement** that defines the relationship between the Customer whose name appears on PG&E's electric service account. This agreement must be executed in addition to agreement 3.

Net Energy Metering Generating Facility

If you wish to have your Generating Facility participate on one of PG&E's Net Energy Metering tariffs, following your bi-directional meter installation, your meter and disconnect switch, when required, must be installed in a safe PG&E accessible location and remain unobstructed by plants, structures, locked gates or pets. Meter and disconnect switch access must be maintained at all times for your safety and PG&E's electrical system safety. Additionally, unencumbered access is required for meter reading, system maintenance, and operations. Any animals owned by the customer, for example pet dogs, should be kept clear from these areas to avoid hindering PG&E service personnel from completing their work.

Are there any meter access issues? Please check all that apply to avoid interconnection delays.

____ Dog, or other animals at Residence

____ Locked Gate

____Shrubs or Bushes

____ Other (please explain) _____

5. **A Net Energy Metering Agreement: Solar and Wind,** that provides for parallel operation of the Generating Facility, and exporting energy to PG&E's Distribution System for credit under the terms of PG&E's Net Energy Metering tariffs pursuant to Public Utility Code Section 2827 for solar PV and/ or wind Generating Facilities greater than 30 kw to 1 MW or a Renewable Electrical Generation Facility (as defined in Schedule NEM) sized less than 1 MW, or any combination of these with a total size of no more than 1 MW per each applicable NEM tariff. This agreement also requires submittal of an expanded net energy metered supplemental application. This option is available only to eligible Generating Facilities as defined in PG&E's Net Energy Metering tariffs.
6. **A Net Energy Metering Agreement: Fuel Cell,** that provides for parallel operation of the Generating Facility, and exporting energy to PG&E's Distribution System for credit under the terms of PG&E's Net Energy Metering tariffs for fuel-cell Generating Facilities. This option is available only to eligible Generating Facilities as defined in PG&E's NEMFC tariff.
7. **Multiple Tariff Generating Facility Agreement,** that provides for the parallel operation of multiple Generating Facilities that are electrically connected behind the same Point of Common Coupling at least one of which is a Generating Facility eligible for service under NEM or other applicable Net Energy Metering tariffs, and may include a Generating Facility not eligible to receive service under a Net Energy Metering tariff.
8. **Other, please describe:** _____

Part IV Cont'd - Describing the Generating Facility and Host Customer's Electrical Facilities

C. *Parallel Operation Applications Only*	If the answer to Section B above was agreement option 1 or 4, please indicate the protection option that will be used to prevent energy from being exported to PG&E's Distribution System. If protection option 3 to this Section C is selected, please provide the continuous current rating of the host Customer facility's service entrance equipment (service panel rating): If Protection Option 4 to this Section C is selected, please provide the minimum load of the host Customer facility:	**Protection Option:** __1 __2 __3 __4 __5 (Choose one) _____ Amps _____ kW

Instructions and Notes

Refer to PG&E's Rule 21, Sections F.1-3 and Section G, for additional information as to how to answer this question. If the Generating Facility will never export power to PG&E's Distribution System, a simpler, lower cost, protection scheme may be used to control the interface between the Generating Facility and PG&E's Distribution System. Choose from the following five options:

1. A reverse-power protection device will be installed to measure any export of power and trip the Generating Facility or open an intertie breaker to isolate the Generating Facility if limits are exceeded.
2. An under-power protection device will be installed to measure the inflow of power and trip or reduce the output of the Generating Facility if limits are not maintained.
3. The Generating Facility Interconnection Facility equipment has been certified as non-islanding and the incidental export of power will be limited by the design of the interconnection. If this option is to be used, the continuous ampere rating of the service entrance equipment (service panel rating) that is used by the host Customer facility must be stated in the space provided above.
4. The Gross Nameplate Rating of the Generating Facility will not exceed 50% of the host Customer facility's minimum electrical load over the past 12 months. If this option is to be used, the minimum load of the host Customer facility must be stated in the space provided above.
5. The Generating Facility completely offset their facility load by being (a) optimally sized to meet their peak demand with load following functionality on the Generator controls and (b) ensuring conditional (inadvertent) export of electric power from the Generation Facility to Distribution Provider's Distribution or Transmission System occurs no more frequently than twice in any 24 hour period and the exports are greater than 2 seconds but no more than more than 60 seconds.

   If this option is selected, you must also choose option 1 or 2.

Note: With the approval of PG&E, a Producer that wishes to retain the option to export power from a Generating Facility to PG&E's Distribution System may use a different protection scheme that provides for the detection of faults and other abnormal operating conditions.

D. *Parallel Operation Applications Only*	What is the maximum 3-phase fault current that will be contributed by the Generating Facility to a 3-phase fault at the Point of Common Coupling (PCC)? (If the Generating Facility is single phase in design, please provide the contribution for a line-to-line fault). Please indicate the short circuit interrupting rating of the host Customer facility's service panel:	_____ Amps _____ Amps

Instructions and Notes

Refer to PG&E's Rule 21, Section G, for significance and additional information. To determine this value, any transformers and/or significant lengths of interconnecting conductor used between each of the Generators (if there are more than one) that make up the

Part IV Cont'd - Describing the Generating Facility and Host Customer's Electrical Facilities

Generating Facility and the PCC must be taken into account. The details, impedance, and arrangement of such transformers and interconnecting conductors should be shown on the single-line diagram that is provided. Consult an electrical engineer or the equipment supplier if assistance is needed in answering this question.

It is expected that most Applicants will want to reserve the flexibility to operate any or all of their Generators in parallel. If the design of the proposed Generating Facility limits the amount of generation that may be interconnected at any time to PG&E's Distribution System, please describe the assumptions used in calculating the maximum fault current contribution value.

E. (MP&I)	Please indicate how this Generating Facility will be operated.	__1 __2 __3 __4 __5 __6 (Please choose all options that may apply.)

Choose from the following seven operation options:

1. **Combined Heat and Power or Cogeneration** – Where the operation of the Generating Facility will produce thermal energy for a process other than generating electricity.
2. **Peak Shaving/Demand Management** – Where the Generating Facility will be operated primarily to reduce electrical demands of the host Customer facility during PG&E's peak pricing periods.
3. **Primary Power Source** – Where the Generating Facility will be used as the primary source of electric power and power supplied by PG&E to the host Customer's loads will be required for supplemental, standby, or backup power purposes only.
4. **Standby / Emergency / Backup** – Where the Generating Facility will normally be operated only when PG&E's electric service is not available.
5. **Net Energy Metering** – Where the Generating Facility qualifies and receives service under PG&E's Net Energy Metering tariffs. For applicants for service under Schedule NEM as described in Part 3 B (7.) and (9.), a supplemental application (Form Number 79-998) is also required.
6. **RES-BCT** – Where the Generating Facility will be operated with no on-site electrical load (other than station load).
7. **Multiple Tariff** - Generating Facilities that have one or more Net Energy Metering (NEM) generator(s) and optionally a non-Net Energy Metering (non-NEM) generator(s). Check one of the following four options on the next sheet.

For **Multiple Tariff** Generating Facilities, check one of the following:

☐ New facility installing non-NEM generator(s) and NEM generator(s) at the same time.

☐ Existing facility with non-NEM generator(s) and planning to add NEM generator(s). Please provide data for the table below.

☐ Existing facility with NEM generator(s) and planning to add non-NEM generator(s). Please provide data for the table below.

☐ Existing facility with NEM generator(s) and planning to add NEM generator(s) under a different NEM tariff. Please provide data for the table below.

Part IV Cont'd - Describing the Generating Facility and Host Customer's Electrical Facilities

Instructions (From Part V)	Generator Information	Existing Generator Type	Existing Generator Type	New Generator Type	New Generator Type	Generating Facility Totals
#	Please indicate the number of each type of Generator being installed: (see Instructions)					
A	Generator/Inverter Manufacturer					
B	Generator/Inverter Model					
C	Generator/Inverter software Version					
D	Is the Generator/Inverter certified	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____Yes ____ No	
E	Generator design	____ Synch ____ Induct. ____ Inverter	____ Synch ____ Induct. ____ Inverter	____ Synch ____ Induct. ____ Inverter	____ Synch ____ Induct. ____ Inverter	
F	Gross Nameplate Rating					
G	Operating Voltage					
H	Power Factor rating					
I	PF Adjustment Range					
J	Wiring Configuration					

Part IV Cont'd - Describing the Generating Facility and Host Customer's Electrical Facilities

Instructions (From Part V)	**Generator Information**	Existing Generator Type	Existing Generator Type	New Generator Type	New Generator Type
K (MP)	3-Phase Winding Configuration (Choose One)	__3 Wire Delta __3 Wire Wye __4 Wire Wye	__3 Wire Delta __3 Wire Wye __4 Wire Wye	__3 Wire Delta __3 Wire Wye __4 Wire Wye	__3 Wire Delta __3 Wire Wye __4 Wire Wye
L (MP)	Neutral Grounding System Used (Choose One)	__ Ungrounded __ Solidly Grounded __ Ground Resistor _____ Ohms	__ Ungrounded __ Solidly Grounded __ Ground Resistor _____ Ohms	__ Ungrounded __ Solidly Grounded __ Ground Resistor _____ Ohms	__ Ungrounded __ Solidly Grounded __ Ground Resistor _____ Ohms
M	*Synchronous Generators Only:* Synchronous Reactance: Transient Reactance: Subtransient Reactance:	 _____ (Xd %) _____ (X'd %) _____ (X"d %)	 _____ (Xd %) _____ (X'd %) _____ (X"d %)	 _____ (Xd %) _____ (X'd %) _____ (X"d %)	 _____ (Xd %) _____ (X'd %) _____ (X"d %)
N	*Induction Generators Only:* Locked Rotor Current: Stator Resistance: Stator Leakage Reactance: Rotor Resistance: Rotor Leakage Reactance:	 _____ (Amps) _____(%) _____(%) _____(%) _____(%)	 _____ (Amps) _____(%) _____(%) _____(%) _____(%)	 _____ (Amps) _____(%) _____(%) _____(%) _____(%)	 _____ (Amps) _____(%) _____(%) _____(%) _____(%)
O	Short Circuit Current Produced by Generator:	_____(Amps)	_____(Amps)	_____(Amps)	_____(Amps)
P	*For Generators that are Started as a "Motor" Only* 1. In-Rush Current: 2. Host Customer's Service Entrance Panel (Main Panel) Continuous Current Rating:	 _____ (Amps) _____ (Amps)	 _____ (Amps) _____ (Amps)	 _____ (Amps) _____ (Amps)	 _____ (Amps) _____ (Amps)
Q (MP&I)	Prime Mover Type: (Circle One)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Part IV Cont'd - Describing the Generating Facility and Host Customer's Electrical Facilities

Instructions (From Part V)	**Generator Information**	Existing Generator Type	Existing Generator Type	New Generator Type	New Generator Type
R	AC Disconnect	______ Manufacturer ______ Model # ______ Rating (amps)	______ Manufacturer ______ Model # ______ Rating (amps)	______ Manufacturer ______ Model # ______ Rating (amps)	______ Manufacturer ______ Model # ______ Rating (amps)
S	Photovoltaic (PV) Panel	______ Manufacturer ______ Model # ______ Nameplate Rating (kw/unit) ______ CEC Rating (kW/unit) ______ Quantity of Panels ______ Total Capacity (kW)	______ Manufacturer ______ Model # ______ Nameplate Rating (kw/unit) ______ CEC Rating (kW/unit) ______ Quantity of Panels ______ Total Capacity (kW)	______ Manufacturer ______ Model # ______ Nameplate Rating (kw/unit) ______ CEC Rating (kW/unit) ______ Quantity of Panels ______ Total Capacity (kW)	______ Manufacturer ______ Model # ______ Nameplate Rating (kw/unit) ______ CEC Rating (kW/unit) ______ Quantity of Panels ______ Total Capacity (kW)
T	Lineside Tap	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No

F. (MP&I)	Please indicate if Qualifying Facility (QF) Status will be obtained from the FERC for this Generating Facility.	__Yes __No

Instructions and Notes

Parties operating Generating Facilities (QF) complying with all of the requirements for qualification as either a small power production facility or cogeneration facility pursuant to the regulations of the FERC (18 Code of Federal Regulations Part 292, Section 292.203 et seq.) implementing the Public Utility Regulatory Policies Act of 1978 (16 U.S.C.A. Section 796, et seq.), or any successor requirements for Qualifying Facilities, may seek certification from FERC to have the Generating Facility designated as a Qualifying Facility or "QF." In summary, QFs are Generating Facilities using renewable or alternative fuels as a primary energy source or facilities that utilize the thermal energy given off by the generation process for some other useful purpose. QFs enjoy certain rights and privileges not available to non-QF Generating Facilities.

QF status is not required to interconnect and operate in parallel with PG&E's Distribution System.

Part IV Cont'd - Describing the Generating Facility and Host Customer's Electrical Facilities

G.	Please indicate if Generating Facility will meet the annual Efficiency and Operating Standards of PUC Code 216.6 (Applicable to Cogeneration Only)	__Yes __No __N/A

Part V – Instructions for Describing the Generators

	Generator Information	Instructions and Comments
#	Please indicate the number of each "type" of Generator being installed:	Please provide the following information for each Generator "type". Be sure all Generators classified as one "type" are identical in all respects. If only one type of Generator is to be used, only one column needs to be completed. Please be sure the information in the "Totals" column is correct and reflects the total number of Generator units to be installed.
A	Generator/Inverter Manufacturer	Enter the brand name of the Generator.
B	Generator/Inverter Model	Enter the model name or number assigned by the manufacturer of the Generator.
C	Generator/Inverter Software Version	If this Generator's control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.
D	Is the Generator Certified by a Nationally Recognized Testing Laboratory (NRTL) according to Rule 21?	Answer "Yes" only if the Generator manufacturer can or has provided certification data. See PG&E's Rule 21, Section L for additional information regarding Generator certification.
E	Generator Design	Please indicate the design of each Generator. Designate "Inverter" anytime an inverter is used as the interface between the Generator and the electric system regardless of the primary power production/storage device used.
F	Gross Nameplate Rating (kVA)	This is the capacity value normally supplied by the manufacturer and stamped on the Generator's nameplate. This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.
G	Operating Voltage	This value should be the voltage rating designated by the manufacturer and used in this Generating Facility. Please indicate phase-to-phase voltages for 3-phase installations. See PG&E's Rule 21, Section H.2.b. and Table H.1., for additional information.

Part V – Cont'd Instructions for Describing the Generators

	Generator Information	Instructions and Comments
H	Power Factor Rating	This value should be the nominal power factor rating designated by the manufacturer for the Generator. See PG&E's Rule 21, Section H.2.i. for additional information.
I	PF Adjustment Range	Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values. See PG&E's Rule 21, Section H.2.i.
J	Wiring Configuration	Please indicate whether the Generator is a single-phase or three-phase device. See PG&E's Rule 21, Section H.3.
K	3-Phase Winding Configuration	For three-phase generating units, please indicate the configuration of the Generator's windings or inverter systems.
L	Neutral Grounding	Wye connected generating units are often grounded – either through a resistor or directly, depending upon the nature of the electrical system to which the Generator is connected. If the grounding method used at this facility is not listed, please attach additional descriptive information.
M	*For Synchronous Generators Only:*	If the Generator is of a synchronous design, please provide the synchronous reactance, transient reactance, and subtransient reactance values supplied by the manufacturer. This information is necessary to determine the short circuit contribution of the Generator and as data in load flow and short circuit computer models of PG&E's Distribution System. If the Generator's Gross Nameplate Capacity is 10 MW or greater, PG&E may request additional data to better model the nature and behavior of the Generator with relation to its Distribution System.
N	*For Induction Generators Only:*	If the Generator is of an induction design, please provide the "locked rotor current" value supplied by the manufacturer. If this value is not available, the stator resistance, stator leakage reactance, rotor resistance, rotor leakage reactance values supplied by the manufacturer may be used to determine the locked rotor current. If the Generator's Gross Nameplate Capacity is 10 MW or greater, PG&E may request additional data to better model the nature and behavior of the Generator with relation to its Distribution System.
O	Short Circuit Current Produced by Generator	Please indicate the current each Generator can supply to a three-phase fault across its output terminals. For single phase Generators, please supply the phase-to-phase fault current.

Part V – Cont'd Instructions for Describing the Generators

	Generator Information	Instructions and Comments
P	*For Generators that are Started as a "Motor" Only:* 1. In-Rush Current 2. Host Customer's Service Entrance Panel (Main Panel) Continuous Current Rating	This information is needed only for Generators that are started by "motoring" the generator. See PG&E's Rule 21, Sections L.3.d. and L.7.b. for significance and additional information. If this question was answered in Part IV, question C of this Application, it need not be answered here.
Q	Prime Mover Type	Please indicate the type and fuel used as the prime mover or source of energy for the Generator. 1 = Internal Combustion Engine – Natural Gas 2 = Internal Combustion Engine – Diesel Fueled 3 = Internal Combustion Engine - Other Fuel 4 = Microturbine– Natural Gas 5 = Microturbine – Other Fuel 6 = Combustion Turbine Natural Gas 7 = Combustion Turbine - Other Fuel 8 = Steam Turbine 9 = Photovoltaic Panels 10 = Solar-thermal engine 11 = Fuel Cell– Natural Gas 12 = Fuel Cell– Other Fuel 13 = Hydroelectric Turbine 14 = Wind Turbine 15 = Other (please describe)
R	AC Disconnect	For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect.
S	Photovoltaic (PV) Panel	For PV systems only, please include requested information about the PV panels.
T	Lineside Tap	PG&E has special requirements for a lineside tap. Contact PG&E at: Rule21Gen@PGE.Com for more information.

ELECTRIC SAMPLE FORM 79-1145 Sheet 1
Rule 21 Exporting Generator
Interconnection Request

Pacific Gas and Electric Company

WE DELIVER ENERGY.SM

RULE 21
EXPORTING GENERATOR INTERCONNECTION REQUEST

1. The undersigned Applicant submits this request to interconnect its Generating Facility with the Pacific Gas and Electric Company (PG&E or Distribution Provider) Distribution System pursuant to Rule 21 (check only one):
   - ☐ Detailed Study Process
   - ☐ Fast Track Process

2. This Interconnection Request is for (check only one):
   - ☐ A proposed new Generating Facility.
   - ☐ An increase in the generating capacity or a Material Modification of an existing Generating Facility.

3. Applicant provides the following information:

   a. Address (to the extent known) or location, including the county, of the proposed new Generating Facility site or, in the case of an existing Generating Facility, the name and specific location, including the county, of the existing Generating Facility;

      Project Name:

      Project Location:
      Street Address:
      City, State:
      County:
      Zip Code:
      GPS Coordinates:

   b. Maximum net megawatt electrical output (as defined by section 2.c. of Attachment A to this appendix) of the proposed new Generating Facility or the amount of net megawatt increase in the generating capacity of an existing Generating Facility;

      Maximum net megawatt electrical output (MW): _____ or
      Net Megawatt increase (MW): _____

   c. Type of project (i.e., gas turbine, hydro, wind, etc.) and general description of the equipment configuration (if more than one type is chosen, include net MW for each);

___ Cogeneration _____ MW
___ Reciprocating Engine _____ MW
___ Biomass _____ MW
___ Steam Turbine _____ MW
___ Gas Turbine _____ MW
___ Wind _____ MW
___ Hydro _____ MW
___ Inverter Based: (e.g., Photovoltaic, Fuel Cell) _____ MW
If Fuel Cell, please describe primary fuel source:
___ Combined Cycle _____ MW
___ Other (please describe):_____

d. Proposed In-Service Date, and Other Key Dates (Day/Month/Year) (Dates must be sequential)

Proposed In-Service Date: / /
Proposed Trial Operation Date: / /
Proposed Commercial Operation Date: / /
Proposed Term of Service (years): _____

e. Name, address, telephone number, and e-mail address of Applicant (primary person who will be contacted);

Name:
Title:
Company Name:
Street Address:
City, State:
Zip Code:
Phone Number:
Fax Number:
Email Address:

f. Approximate location of the proposed Point of Interconnection (i.e., specify distribution facility interconnection point name, voltage level, and the location of interconnection);

g. Applicant Data (set forth in Attachment A)

The Applicant shall provide to the Distribution Provider the technical data called for in Attachment A.

h. AC Disconnect Switch. List the AC disconnect switch that will be used at this Generating Facility (enter "N/A" if not applicable)

Disconnect Switch Manufacturer: _____
Disconnect Switch Model Number: _____
Disconnect Switch Rating (amps): _____

4. Application Fee and Detailed Study Deposit as specified in Rule 21 is required to complete this application. Upon receipt of this Interconnection Request and Attachment A, PG&E will send a separate invoice for the applicable fee or deposit. **PLEASE DO NOT INCLUDE ANY CHECKS/MONIES WITH THIS INTERCONNECTION REQUEST**. (Any checks/monies submitted with this IR will be returned to the sender and may result in a delay in the application process.)

5. Attach evidence of Site Exclusivity as specified in Rule 21 Section E.2.d as applicable, and name(s), address(es) and contact information of site owner(s).

6. **Interconnection Request Instructions:** Complete this interconnection request and enter this information into PG&E's web-based form. (PG&E strongly recommends preparing all information and materials before starting the online interconnection request.) The online web-based from can be found at:

http://www.pge.com/mybusiness/customerservice/nonpgeutility/generateownpower/distributedgeneration/generationrule21/

Questions concerning PG&E's online interconnection request process can be directed to the Electric Generation Interconnection Department at **rule21gen@pge.com**..

7 Representative of Applicant to contact:

[To be completed by Applicant]
Name:
Title:
Company Name:
Street Address:
City, State:
Zip Code:
Phone Number:
Fax Number:
Email Address:

8. If the Applicant also requires new Distribution Service, the Distribution Provider will coordinate these efforts with this application. The Applicant must also complete a PG&E Application for Service. Additional fees may be required if a service or line extension is required (in accordance with PG&E Electric Rules 15 and 16). Please contact PG&E's Building and Renovation Services Center (BRSC): 1-800-743-7782 to initiate the application for the new Distribution Service. Additional information will be required in conjunction with an application for new Distribution Service.

9. Applicant should be aware that if Applicant has not yet received Rule 21 Screen Q results from PG&E by March 15 following submittal of this IR, Applicant will need to submit, if Applicant voluntarily chooses to do so, an Interconnection Request under PG&E's FERC Wholesale Distribution Tariff (WDT) by the close of the CAISO cluster application window(refer to http://www.caiso.com/docs/2002/06/11/20020611103004272l4.html for the exact date) in order to participate in the Transmission Cluster Study for the year. An application under WDT will not impact the results of this Rule 21 study.

10. This Interconnection Request is submitted by:

Legal name of Applicant: _____

By (signature): _____

Name (type or print): _____

Title: _____

Date: _____

Attachment A to PG&E Rule 21 Exporting Generator Interconnection Request

GENERATING FACILITY DATA

Each Applicant will complete Sections 1 and 2 of this Attachment A.
Each Applicant will complete the applicable data in Sections 3 through 6 of this Attachment A based on the type of generating facility(ies) requesting interconnection. (Section 3 for synchronous generators, Section 4 for induction generators, Section 5 for wind turbine generators, and Section 6 for inverter-based generators).
Each Applicant will complete Sections 7 through 10, as applicable.
At any time, Distribution Provider may require Applicant to provide additional technical data, or additional documentation supporting the technical data provided, as deemed necessary by the Distribution Provider to perform Interconnection Studies, other studies, or evaluations as set forth under Rule 21.

1. Provide electronic copies of the following:

A. Site drawing to scale, showing generator location and Point of Interconnection with the Distribution Provider's Distribution System.
B. Single-line diagram showing applicable equipment such as generating units, step-up transformers, auxiliary transformers, switches/disconnects of the proposed interconnection, including the required protection devices and circuit breakers. For wind and photovoltaic generator projects, the one line diagram should include the distribution lines connecting the various groups of generating units, the generator capacitor banks, the step up transformers, the distribution lines, and the substation transformers and capacitor banks at the Point of Interconnection with the Distribution Provider's Distribution System. This one-line drawing must be signed and stamped by a licensed Professional Engineer if the Generating Facility is larger than 50 kW.
C. AC and DC schematics if available. Required for detailed study process.
D. Description of operations.

Note: Electronic processing is preferred, however, if submitting via U.S. mail, provide one original print of items in A through D, above.

2. Generating Facility General Information:

A. Total Generating Facility rated output (MW): _____
B. Generating Facility auxiliary Load (MW): _____
C. Project net capacity (MW): _____
D. Standby Load when Generating Facility is off-line (MW): _____
E. Number of Generating Units: _____
(Please repeat the following items for each generator)
F. Individual generator rated output (MW for each unit): _____
G. Type (induction, synchronous, D.C. with inverter): _____
H. Phase (3 phase or single phase): _____

3. Synchronous Generator –Information:

3A Generator Information:
(Please repeat the following for each generator)

A. Manufacturer: _____
B. Year Manufactured: _____
C. Rated Generator speed (rpm):_____
D. Rated MVA: _____
E. Rated Terminal Voltage (kV): _____
F. Rated Generator Power Factor Range: _____
G. Generator Efficiency at Rated Load (%): _____
H. Moment of Inertia (including prime mover): _____
I. Inertia Time Constant (on machine base) H: _____ sec or MJ/MVA
J. SCR (Short-Circuit Ratio - the ratio of the field current required for rated open-circuit voltage to the field current required for rated short-circuit current): _____
K. Please attach generator reactive capability curves.
L. Rated Hydrogen Cooling Pressure in psig (Steam Units only): _____
M. Please attach a plot of generator terminal voltage versus field current that shows the air gap line, the open-circuit saturation curve, and the saturation curve at full load and rated power factor.

3B Excitation System Information:
(Please repeat the following for each generator)

A. Indicate the Manufacturer _____ and Type _____of excitation system used for the generator. For exciter type, please choose from 1 to 9 below or describe the specific excitation system.
   (1) Rotating DC commutator exciter with continuously acting regulator. The regulator power source is independent of the generator terminal voltage and current.
   (2) Rotating DC commentator exciter with continuously acting regulator. The regulator power source is bus fed from the generator terminal voltage.
   (3) Rotating DC commutator exciter with non-continuously acting regulator (i.e., regulator adjustments are made in discrete increments).
   (4) Rotating AC Alternator Exciter with non-controlled (diode) rectifiers. The regulator power source is independent of the

generator terminal voltage and current (not bus-fed).

(5) Rotating AC Alternator Exciter with controlled (thyristor) rectifiers. The regulator power source is fed from the exciter output voltage.

(6) Rotating AC Alternator Exciter with controlled (thyristor) rectifiers.

(7) Static Exciter with controlled (thyristor) rectifiers. The regulator power source is bus-fed from the generator terminal voltage.

(8) Static Exciter with controlled (thyristor) rectifiers. The regulator power source is bus-fed from a combination of generator terminal voltage and current (compound-source controlled rectifiers system.

(9) Other (specify): _____

B. Attach a copy of the block diagram of the excitation system from its instruction manual. The diagram should show the input, output, and all feedback loops of the excitation system.

C. Excitation system response ratio (ASA): _____

D. Full load rated exciter output voltage: _____

E. Maximum exciter output voltage (ceiling voltage): _____

F. Other comments regarding the excitation system? _____
_____

3C Turbine-Governor Information:
(Please repeat the following for each generator)

Please complete Part A for steam, gas or combined-cycle turbines, Part B for hydro turbines, and Part C for both.

A. Steam, gas or combined-cycle turbines:

(1) List type of unit (Steam, Gas, or Combined-cycle):_____

(2) If steam or combined-cycle, does the turbine system have a reheat process (i.e., both high and low pressure turbines)? _____

(3) If steam with reheat process, or if combined-cycle, indicate in the space provided, the percent of full load power produced by each turbine:

Low pressure turbine or gas turbine: _____%

High pressure turbine or steam turbine: _____%

(4) For combined cycle plants, specify the plant net output capacity (MW) for an outage of the steam turbine or an outage of a single combustion turbine: _____

B. Hydro turbines:

(1) Turbine efficiency at rated load: _____%

(2) Length of penstock: _____ft
(3) Average cross-sectional area of the penstock: _____ft2
(4) Typical maximum head (vertical distance from the bottom of the penstock, at the gate, to the water level): _____ft
(5) Is the water supply run-of-the-river or reservoir: _____
(6) Water flow rate at the typical maximum head: _____ft^3/sec
(7) Average energy rate: _____kW-hrs/acre-ft
(8) Estimated yearly energy production: _____kW-hrs

C. Complete this section for each machine, independent of the turbine type.

(1) Turbine manufacturer: _____
(2) Maximum turbine power output: _____MW
(3) Minimum turbine power output (while on line): _____MW
(4) Governor information:
(a) Droop setting (speed regulation): _____
(b) Is the governor mechanical-hydraulic or electro-hydraulic (Electro-hydraulic governors have an electronic speed sensor and transducer.)? _____
(c) Other comments regarding the turbine governor system?
_____
_____
_____
_____

3D Short Circuit Duty Information:
For each generator, provide the following reactances expressed in p.u. on the generator base:

- Xd – Direct Axis Synchronous Reactance: _____ p.u.
- X'd – Direct Axis Transient Reactance: _____ p.u.
- X"d – Direct Axis Subtransient Reactance: _____ p.u.
- X2 – Negative Sequence Reactance: _____ p.u.
- X0 – Zero Sequence Reactance: _____ p.u.

Generator Grounding (select one for each model):

A. _____ Solidly grounded
B. _____ Grounded through an impedance
(Impedance value in p.u. on generator base. R:_____p.u.
X: _____p.u.)
C. _____ Ungrounded

4. Induction Generator Information:
(Please repeat the following for each generator)

A. Motoring Power (kW): _____
B. I_2^2t or K (Heating Time Constant): _____
C. Rotor Resistance, Rr: _____
D. Stator Resistance, Rs: _____
E. Stator Reactance, Xs: _____
F. Rotor Reactance, Xr: _____
G. Magnetizing Reactance, Xm: _____
H. Short Circuit Reactance, Xd": _____
I. Exciting Current: _____
J. Temperature Rise: _____
K. Frame Size: _____
L. Design Letter: _____
M. Reactive Power Required In Vars (No Load): _____
N. Reactive Power Required In Vars (Full Load): _____
O. Total Rotating Inertia, H: _____ Per Unit on kVA Base

5. Wind Turbine Generator (WTG) Information:

(Proposed projects may include one or more WTG types. Please repeat the following for each type of WTG).

A. WTG Manufacturer and Model: _____
B. Number of WTGs: _____
C. WTG Type (check one):
_____ Type 1 (Squirrel-cage induction generator)
_____ Type 2 (Wound rotor induction machine with variable rotor resistance)
_____ Type 3 (Doubly-fed asynchronous generator)
_____ Type 4 (Full converter interface)
D. Nameplate Rating (each WTG): _____/_____ kW/kVA
E. Rated Terminal Voltage: _____ kV
F. For Type 1 or Type 2 WTGs:
(1) uncompensated power factor at full load: _____
(2) power factor correction capacitors at full load: _____MVAR
(3) number of shunt stages and size: _____
(4) Please attach capability curve describing reactive power or power factor range from no output to full rated output, including the effect of shunt compensation
G. For Type 3 or Type 4 WTGs:
(1) Maximum under-excited power factor at full load: _____
(2) Maximum over-excited power factor at full load: _____
(3) Control mode: _____ (voltage control, fixed power factor)
(4) Please attach capability curve describing reactive power or power factor range from no output to full rated output

H. Short Circuit Characteristics: Applicant to provide technical data related to the short circuit characteristics of proposed WTGs for short circuit duty study modeling purposes. For example, the applicant can provide manufacturer short circuit test data showing faulted condition for three phase and single-line-to-ground fault.

Distribution Provider may require testing verification of voltage and harmonic performance during commissioning test of WTG based generation projects.

6. Inverter Based Generation Systems Information:

Proposed inverter based generation projects may include one or more types of inverters. Please provide answers to the following for each type of inverter.

A. Inverter Manufacturer and Model: _____
B. Number of Inverters: _____
C. Nameplate Rating (AC, each inverter): _____/_____ kW
D. Nameplate Voltage Rating (AC): _____ kV
E. Maximum AC line current: _____ Amps
F. Nameplate Power Factor Rating (AC): _____
G. Please attach capability curve describing reactive power or power factor range from no output to full rated output
H. Inverter control mode (e.g. voltage, power factor, reactive power): _____
I. Short Circuit Characteristics: Applicant to provide technical data related to the short circuit characteristics of proposed inverter based generation systems. For example, the applicant can provide a sinusoidal waveform test data showing faulted condition at the AC side of the inverter for a three phase and single-line-to-ground fault.
J. Harmonics Characteristics:
   (1) Inverter switching frequency: _____
   (2) Harmonic characteristics for each unit up to switching frequency: _____
   (3) Harmonic characteristics for aggregate generation facility: _____
K. Inverter disconnection characteristics: Applicant to provide voltage sinusoidal waveform test data which shows the voltage characteristics during disconnection of inverter system from distribution system at 100% and at 50% of rated output.

Distribution Provider may require testing verification of voltage and harmonic performance during commissioning test of the inverter based generation systems.

7. Step-Up Transformer Data:

For each step-up transformer (e.g. main step-up transformers, padmount transformers), fill out the data form provided in Table 1.

8. Plant-Level Reactive Power Compensation Data:
Provide the following information for plant-level reactive power compensation, if applicable:

A. Number of individual shunt capacitor banks: _____
B. Individual shunt capacitor bank rated voltage (kV): _____
C. Individual shunt capacitor bank size (kVAR at rated voltage): _____
D. Planned dynamic reactive control devices (SVC, STATCOM): _____
E. Control range: _____ kVAR (lead) _____ kVAR (lag)
F. Control mode (e.g. voltage, power factor, reactive power): _____
G. Please provide the overall plant reactive power control strategy

9. Load Flow and Dynamic Models:
Only provide data in this section when requested by the Distribution Provider.

The WECC Data Preparation Manual for Power Flow Base Cases and Dynamic Stability Data has established power flow and dynamic modeling requirements for generation projects in WECC base cases. In general, if the aggregate sum of generation on a bus exceeds 10 MVA, it should not be netted. Furthermore, the total netted generation in an area should not exceed five percent of the area's total generation. Based on current WECC modeling requirements, the following information will be required for all generation projects whose net capacity is greater than 10 MVA. The following information may also be required for generation projects less than 10 MVA on a case-by-case basis, based on the amount of generation in the area of the requested Point of Interconnection.

A. Provide load flow model for the generating plant and its interconnection facilities in GE PSLF *.epc format, including new buses, generators, transformers, interconnection facilities. An equivalent model is required for the plant with generation collector systems. This data should reflect the technical data provided in this Attachment A.

B. For each generator, governor, exciter, power system stabilizer, WTG, or inverter based generator, select the appropriate dynamic models from the General Electric PSLF Program Manual and provide the required input data. Include any user written *.p EPCL files to simulate inverter based plants' dynamic responses (typically needed for inverter based PV/wind plants). Provide a completed *.dyd file that contains the information specified in this section.

The GE PSLF manual is available upon request from GE. There are links within the GE PSLF User's Manual to detailed descriptions of specific models, a definition of each parameter, a list of the output channels, explanatory notes, and a control system block diagram. In addition, GE PSLF modeling information and various modeling guidelines

documents have been prepared by the WECC Modeling and Validation Work Group. This information is available on the WECC website (www.wecc.biz).

If you require assistance in developing the models, we suggest you contact General Electric. Accurate models are important to obtain accurate study results. Costs associated with any changes in facility requirements that are due to differences between model data provided by the generation developer and the actual generator test data, may be the responsibility of the generation developer.

TABLE 1

TRANSFORMER DATA
(Provide for each level of transformation)

UNIT_____

NUMBER OF TRANSFORMERS_____ PHASE _____

RATING	H Winding	X Winding	Y Winding
Rated MVA	_____	_____	_____
Connection (Delta, Wye, Gnd.)	_____	_____	_____
Cooling Type (OA,OA/FA, etc.) :	_____	_____	_____
Temperature Rise Rating	_____	_____	_____
Rated Voltage	_____	_____	_____
BIL	_____	_____	_____
Available Taps (% of rating)	_____	_____	_____
Load Tap Changer? (Y or N)	_____	_____	_____
Tap Settings	_____	_____	_____
IMPEDANCE	H-X	H-Y	X-Y
Percent	_____	_____	_____
MVA Base	_____	_____	_____
Tested Taps	_____	_____	_____
WINDING RESISTANCE	H	X	Y
Ohms	_____	_____	_____

CURRENT TRANSFORMER RATIOS

H_____ X_____ Y_____ N_____

PERCENT EXCITING CURRENT 100 % Voltage; _____ 110% Voltage_____

Supply copy of nameplate and manufacturer's test report when available.

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Sheet 25

SAMPLE FORMS

(Continued)

PG&E Gas and Electric
Advice Filing List
General Order 96-B, Section IV

1st Light Energy
AT&T
Alcantar & Kahl LLP
Anderson & Poole
BART
Barkovich & Yap, Inc.
Bartle Wells Associates
Bear Valley Electric Service
Braun Blaising McLaughlin, P.C.
CENERGY POWER
California Cotton Ginners & Growers Assn
California Energy Commission
California Public Utilities Commission
Calpine
Casner, Steve
Center for Biological Diversity
City of Palo Alto
City of San Jose
Clean Power
Coast Economic Consulting
Commercial Energy
Crossborder Energy
Davis Wright Tremaine LLP
Day Carter Murphy
Defense Energy Support Center
Dept of General Services
Douglass & Liddell
Downey & Brand
Ellison Schneider & Harris LLP
G. A. Krause & Assoc.
GenOn Energy Inc.
GenOn Energy, Inc.
Goodin, MacBride, Squeri, Schlotz & Ritchie
Green Power Institute
Hanna & Morton
In House Energy
International Power Technology
Intestate Gas Services, Inc.
Kelly Group
Linde
Los Angeles Dept of Water & Power
MAC Lighting Consulting
MRW & Associates
Manatt Phelps Phillips
Marin Energy Authority
McKenna Long & Aldridge LLP
McKenzie & Associates
Modesto Irrigation District
Morgan Stanley
NLine Energy, Inc.
NRG Solar
Nexant, Inc.
North America Power Partners
Occidental Energy Marketing, Inc.
OnGrid Solar
Pacific Gas and Electric Company
Praxair
Regulatory & Cogeneration Service, Inc.
SCD Energy Solutions
SCE
SDG&E and SoCalGas
SPURR
San Francisco Public Utilities Commission
Seattle City Light
Sempra Utilities
SoCalGas
Southern California Edison Company
Spark Energy
Sun Light & Power
Sunshine Design
Tecogen, Inc.
Tiger Natural Gas, Inc.
TransCanada
Utility Cost Management
Utility Power Solutions
Utility Specialists
Verizon
Water and Energy Consulting
Wellhead Electric Company
Western Manufactured Housing Communities Association (WMA)