APPENDIX 1 to GIP

**WHOLESALE DISTRIBUTION ACCESS TARIFF
INTERCONNECTION REQUEST FOR A
GENERATING FACILITY**

Provide two copies of this completed form pursuant to Section 7 of this GIP Appendix 1 below.

1. The undersigned Interconnection Customer submits this request to interconnect its Generating Facility with Distribution Provider's Distribution System pursuant to the following process under Appendix I of the Tariff (check only one):
   - ☐ Cluster Study Process
   - ☐ Independent 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.
   - ☐ A change to Full Capacity Deliverability Status for a Generating Facility previously studied as Energy Only Deliverability Status in accordance with Section 4.7 of the GIP (Full Capacity Deliverability Study).

3. Deliverability Study is performed by the ISO. Requested Deliverability Status is for (check only one):
   - ☐ Full Capacity Deliverability Status (this option applies to the Cluster Study Process and Independent Study Process only)
   - ☐ Energy Only Deliverability Status (this option applies to the Cluster Study Process, Independent Study Process, and Fast Track Process)

4. Interconnection Customer provides the following information:

   a. Address or location, including the county, of the proposed new Generating Facility site (to the extent known) 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 Interconnection Customer's contact person (primary person who will be contacted);

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

Fax Number:
Email Address:
Interconnection Customer's DUNS Number:

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. Interconnection Customer Data (set forth in Attachment A)

The Interconnection Customer shall provide to the Distribution Provider the technical data called for in Attachment A. Two (2) copies are required.

5. Applicable Interconnection Study Deposit amount as specified in GIP Section 4.2.1 or 4.7.1, as applicable, for the Cluster Study Process or GIP Section 5.2.1 for the Independent Study Process, or $1,500 as provided in GIP Section 6.2 for the Fast Track Process made payable to Southern California Edison Company. Send check to Distribution Provider along with:

   1. A completed Interconnection Request form for processing.
   2. A completed Attachment A (Interconnection Request Generating Facility Data).

6. Evidence of Site Exclusivity as specified in GIP Sections 4.2.1, 5.2.1, or 6.3, as applicable, and name(s), address(es) and contact information of site owner(s). (check one)

   ☐ Is attached to this Interconnection Request
   ☐ If Interconnection Customer requests processing under the Cluster Study Process, then deposit in lieu of Site Exclusivity attached. Site Exclusivity will be provided at a later date in accordance with this GIP.

7. This Interconnection Request shall be submitted to the representative indicated below:

   Southern California Edison Company
   Director of FERC Policy & Contracts
   P.O. Box 800
   Rosemead, CA 91770

   Overnight address: 2244 Walnut Grove Avenue, Rosemead, CA 91770

8. Representative of Interconnection Customer to contact:

   [To be completed by Interconnection Customer]
   Name:
   Title:

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

9. If the Interconnection Customer also requests Distribution Service, additional information and an additional deposit is required in accordance with Section 15.2 of the Tariff.

10. This Interconnection Request is submitted by:

Legal name of Interconnection Customer: _____

By (signature): _____

Name (type or print): _____

Title: _____

Date: _____

Attachment A to
Interconnection Request

WHOLESALE DISTRIBUTION ACCESS TARIFF
GENERATING FACILITY DATA

Provide two copies of this completed form pursuant to Section 7 of Interconnection Request.

Each Interconnection Customer will complete Sections 1 and 2 of this Attachment A.
Each Interconnection Customer 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 Interconnection Customer will complete Sections 7 through 10, as applicable.
At any time, Distribution Provider may require Interconnection Customer 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 the GIP.

1. Provide two original prints and one reproducible copy (no larger than 36" x 24") 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.

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: _____
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 Power System Stabilizer Information:
(Please repeat the following for each generator.)

A. Manufacturer: _____

B. Is the PSS digital or analog? _____

C. Note the input signal source for the PSS?
_____ Bus frequency _____ Shaft speed _____
Bus Voltage _____ Other (specify source)

D. Please attach a copy of a block diagram of the PSS from the PSS Instruction Manual and the correspondence between dial settings and the time constants or PSS gain.

E. Other comments regarding the PSS?
_____
_____
_____

3D 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?
_____
_____
_____
_____

3E 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 repeat 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. Line Data:

For transmission lines that are to be planned by the generation developer, please provide the following information:

Nominal Voltage: _____ kV
Line Length (miles): _____
Line termination Points: _____
Conductor Type: _____ Size: _____
If bundled. Number per phase: _____, Bundle spacing: _____in.
Phase Configuration. Vertical: _____, Horizontal: _____
Phase Spacing (ft): A-B: _____, B-C: _____, C-A: _____
Distance of lowest conductor to Ground at full load and 40°C: _____ft
Ground Wire Type: _____ Size: _____ Distance to Ground: _____ft
Attach Tower Configuration Diagram
Summer line ratings in amperes (normal and emergency) _____
Positive Sequence Resistance (R): _____ p.u.** (for entire line length)
Positive Sequence Reactance: (X): _____ p.u.** (for entire line length)
Zero Sequence Resistance (R0): _____ p.u.** (for entire line length)
Zero Sequence Reactance: (X0): _____ p.u.** (for entire line length)
Line Charging (B/2): _____ p.u.**
** On 100-MVA and nominal line voltage (kV) Base

9. 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

10. Load Flow and Dynamic Models:

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.