

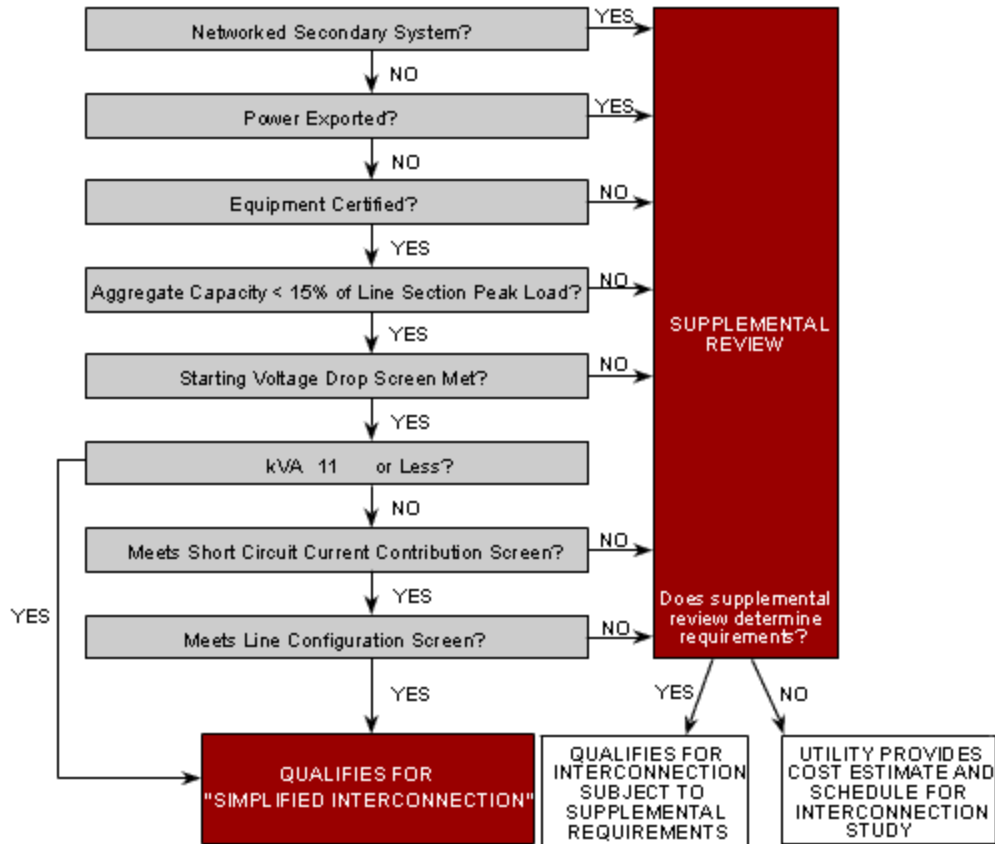
**CALIFORNIA DISTRIBUTED ENERGY RESOURCE  
GUIDE:  
Electrical Interconnection Procedures**

## OVERVIEW

The application process for interconnection of DER devices to the electric grid involves a number of standardized steps:

1. Applicant Initiates Contact with the Electrical Corporation - Upon initial request, the utility will provide all relevant applications forms, documents, and technical requirements for grid interconnection of DER. The utility will establish an individual representative as the single point of contact for the applicant.
2. Applicant Completes an Application Document - The applicant completes and files a standardized Application for the interconnection of a DER device. The utility will acknowledge the receipt of the Application and verify that it has been adequately completed.
3. Electrical Corporation Performs an Initial Review and Develops Preliminary Cost Estimates and Interconnection Requirements - The utility will perform an Initial Review to determine the type of interconnection for which the applicant qualifies.
  - a. **Simplified Interconnection** - If the applicant qualifies for Simplified Interconnection, the utility will provide the applicant with a written description of the interconnection requirements, in addition to a draft Interconnection Agreement.
  - b. **Interconnection Subject to Additional Requirements** - The Initial Review will require a Supplemental Review if the applicant does not qualify for Simplified Interconnection. The Supplemental Review provides either:
    - i. Interconnection requirements that may include additional requirements beyond Simplified Interconnection and a draft Interconnection Agreement.
    - ii. A cost estimate and schedule for an Interconnection Study. In this case, the applicant and utility shall enter into an Interconnection Study Agreement. After completion of an Interconnection Study, the utility will provide the applicant with specific requirements, costs, and a schedule for the interconnection of the DER device.
4. Applicant and Electrical Corporation Enter Into a Generation Interconnection Agreement - The utility provides the applicant with an executable version of the Interconnection Agreement, Net Energy Metering Agreement, or Power Purchase Agreement (whichever is appropriate for the applicant's DER device and its mode of operation).
5. Applicant Installs or Constructs the Generating Facility to Interconnect with the Electric Grid - The applicant interconnects the DER device in accordance with the provisions of the Interconnection Agreement, Net Energy Metering Agreement, or Power Purchase Agreement.
6. Applicant Arranges for and Completes Testing of the DER Device - Before operating in parallel with the electric grid, the DER device and associated interconnection equipment must be tested to ensure compliance with the safety and reliability provisions of the CPUC-approved rules and regulations.
7. Electrical Corporation Authorizes Interconnection - The applicant's DER device may commence parallel operation with the utility's electric grid.

The flow chart below outlines the initial review process for applications to interconnect DER devices.



**[EXEMPTION:**

This CA PSC text/order exempts certain DG procedures:

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking into Distributed Generation. Rulemaking 99-10-025

(Filed October 21, 1999) ]

**Opinion Interpreting Public Utilities Code Section 2827**

Summary: Generators eligible for net energy metering under Pub. Util. Code § 2827<sup>1</sup> are exempt from paying for costs associated with interconnection studies, distribution system modifications, or application review fees.

<sup>1</sup> All statutory references are to the Pub. Util. Code, unless otherwise noted.

## **DECISION ADOPTING INTERCONNECTION STANDARDS**

Decision 00-12-037 December 21, 2000

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Into Distributed Generation: Rulemaking 99-10-025

(Filed October 21, 1999)

### **1. Summary**

This decision approves the Rule 21 language adopted by the California Energy Commission (Energy Commission) on October 25, 2000 in its entirety, as conformed with Decision (D.) 00-11-001. A Model Tariff is set forth in Attachment A that incorporates changes made in D.00-11-001 into the Energy Commission recommendation. A model Interconnection Application Form and agreement are set forth in Attachments B and C.

Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), and Southern California Edison Company (SCE) are directed to file compliance advice letters to replace their existing Rule 21 with the Model Tariff, Interconnection Application Form and Agreement, within 15 days of the effective date of this order. Within 40 days of the effective date of this order, other respondent utilities (Sierra Pacific Power Company (Sierra), Pacificorp, Mountain Utilities, and Bear Valley Electric) are directed to either file a compliance advice letter adopting the Model Tariff, Interconnection Application Form and Agreement, or a compliance filing in this docket demonstrating compelling reasons why the adopted rules, forms, and agreements should not apply to them.

## Rule 21 Model Tariff Language

### 1. APPLICABILITY AND INTRODUCTION

**1.1 Applicability.** This Rule describes the interconnection, operating and metering requirements for Generating Facilities that are intended to be connected to the Distribution System over which the California Public Utilities Commission (CPUC) has jurisdiction. Subject to the requirements of this Rule, Electrical Corporation will allow the interconnection of Generating Facilities with its Distribution System.

**1.2 Definitions.** Capitalized terms used in this Rule, and not otherwise defined, shall have the meaning ascribed to such terms in Section 8.

**1.3 Enabling Documents.** It is contemplated that the Applicant will be required to execute various enabling documents, such as the Application and Interconnection Agreement. Such documents shall be in the form on file with the CPUC, as may be amended from time to time.

### 2. GENERAL RULES, RIGHTS AND OBLIGATIONS

**2.1 Authorization Required to Interconnect.** An Electricity Producer must comply with this Rule, form an Interconnection Agreement with Electrical Corporation, and receive Electrical Corporation's express written permission to interconnect before connecting or operating a Generating Facility in parallel with the Electrical Corporation's Distribution System. Electrical Corporation shall apply this Rule in a non-discriminatory manner and shall not unreasonably withhold its permission to interconnect an Electric Producer's Generating Facility.

**2.2 Separate Arrangements Required for Other Services.** An Electricity Producer requiring other electric services from the Electrical Corporation including, but not limited to, Distribution Service provided by the Electrical Corporation during periods of curtailment or interruption of a Generating Facility, must enter into separate arrangements with Electrical Corporation for such services in accordance with CPUC-approved tariffs.

**2.3 Transmission Service Not Provided with Interconnection.** Interconnection with the Electrical Corporation's Distribution System under this Rule does not provide an Electricity Producer any rights to utilize Electrical Corporation's Distribution System for the transmission or distribution of electric power, nor does it limit those rights.

**2.4 Compliance with Laws, Rules, and Tariffs.** An Electricity Producer shall ascertain and comply with applicable CPUC-approved rules, tariffs, and regulations of the Electrical Corporation; applicable FERC-approved rules, tariffs, and regulations; and any local, state or federal law, statute or regulation which applies to the design, siting, construction, installation, operation, or any other aspect of the Electricity Producer's Generating Facility and Interconnection Facilities.

**2.5 Design Reviews and Inspections.** Electrical Corporation shall have the right to review the design of an Electricity Producer's Generating Facility and Interconnection Facilities and to inspect an Electricity Producer's Generating and/or Interconnection Facilities prior to the commencement of Parallel Operation with Electrical Corporation's Distribution System. Electrical Corporation may require an Electricity Producer to make modifications as necessary to comply with the requirements of this Rule. Electrical Corporation's review and authorization for Parallel Operation shall not be construed as

confirming or endorsing the Electricity Producer's design or as warranting the Generating and/or Interconnection Facility's safety, durability or reliability. Electrical Corporation shall not, by reason of such review or lack of review, be responsible for the strength, adequacy, or capacity of such equipment.

**2.6 Right to Access.** An Electricity Producer's Generating Facilities and Interconnection Facilities shall be reasonably accessible to Electrical Corporation personnel as necessary for Electrical Corporation to perform its duties and exercise its rights under its tariffs and rules filed with and approved by the CPUC, and any agreement between Electrical Corporation and the Electricity Producer.

**2.7 Confidentiality of Information.** Any information pertaining to Generating and/or Interconnection Facilities provided to an Electrical Corporation by an Electricity Producer shall be treated by Electrical Corporation in a confidential manner. Electrical Corporation shall not use information contained in the Application to propose discounted tariffs to the customer unless authorized to do so by the customer or the information is provided to Electrical Corporation by the customer through other means.

**2.8 Prudent Operation and Maintenance Required.** An Electricity Producer shall operate and maintain its Generating Facility and Interconnection Facilities in accordance with Prudent Electrical Practices and shall maintain compliance with CPUC adopted standards for the Electricity Producer's particular Generation and Interconnection Facilities. Said standards shall be those in effect at the time an Electricity Producer executes an Interconnection Agreement with Electrical Corporation.

**2.9 Curtailment and Disconnection.** Electrical Corporation may limit the operation and/or disconnect or require the disconnection of an Electricity Producer's Generating Facility from Electrical Corporation's Distribution System at any time, with or without notice, in the event of an Emergency, or to correct Unsafe Operating Conditions. Electrical Corporation may also limit the operation and/or disconnect or require the disconnection of an Electricity Producer's Generating Facility from Electrical Corporation's Distribution System upon the provision of reasonable notice: 1) to allow for routine maintenance, repairs or modifications to Electrical Corporation's Distribution System; 2) upon Electrical Corporation's determination that an Electricity Producer's Generating Facility is not in compliance with this Rule; or, 3) upon termination of the Interconnection Agreement.

### **3. APPLICATION AND INTERCONNECTION PROCESS**

#### **3.1 Application Process**

**3.1.1 Applicant Initiates Contact with the Electrical Corporation.** Upon request, the Electrical Corporation will provide information and documents (such as an application form, contract and technical requirements, specifications, listing of Certified Equipment, application fee information, applicable rate schedules and metering requirements) in response to the potential Applicant's inquiry. Unless otherwise agreed upon, all such information and a copy of the Electrical Corporation's standardized interconnection requirements shall normally be sent to the Applicant within three (3) business days following the initial request from the Applicant. The Electrical Corporation will establish an individual representative as the single point of contact for the Applicant, but may allocate responsibilities among its staff to best coordinate the Interconnection of a Applicant's Generating Facility.

**3.1.2 Applicant Completes an Application Document.** All Applicants shall be required to complete and file an Application document and supply any additional information requested by the Electrical Corporation. The filing must include the completed standardized Application, which may be either in paper or electronic form, and a fee for processing the application and performing the Initial Review to be completed by the Electrical Corporation pursuant to Section 3.1.3. The application fee shall be non-refundable and shall vary with the nature of the proposed Generating Facility as follows:

Type of Generating Facility	Application Fee
Net energy Metering	None
(per P.U. Code Sec. 2827)	
< or = 11 kVA	\$ (Fixed; amount TBD)_____
All others	\$(Fixed; amount TBD)_____

Within ten (10) business days of receiving an Application, the Electrical Corporation shall normally acknowledge its receipt and whether the Application has been completed adequately. If defects are noted, the Electrical Corporation and Applicant shall cooperate in a timely manner to establish a satisfactory Application.

**3.1.3 Electrical Corporation Performs an Initial Review and Develops Preliminary Cost Estimates and Interconnection Requirements.**

3.1.3.1 Upon receipt of a satisfactorily completed Application and any additional information necessary to evaluate the Interconnection of a Generating Facility, the Electrical Corporation shall perform an Initial Review using the process defined in Appendix A. The Initial Review determines if the Application qualifies for Simplified Interconnection, if the Application can qualify for Interconnection subject to additional requirements, or if it will be necessary for Electrical Corporation to perform an Interconnection Study to determine Interconnection Requirements.

3.1.3.2 The Electrical Corporation shall complete its Initial Review, absent any extraordinary circumstances, within 10 business days if the Application qualifies for Simplified Interconnection. If the Initial Review determines that the proposed facility can be interconnected by means of a Simplified Interconnection, the Electrical Corporation will provide the Applicant with a written description of the requirements for interconnection and a draft Interconnection Agreement pursuant to Section 3.1.5.

3.1.3.3 If the Application does not qualify for Simplified Interconnection as submitted, the Initial Review will include a supplemental review as described in Appendix A. The supplemental review provides either (a) Interconnection Requirements that may include requirements beyond those for Simple

Interconnection, and a draft Interconnection Agreement, or (b) a cost estimate and schedule for an Interconnection Study. The supplemental review shall be completed, absent any extraordinary circumstances, within 20 business days of receipt of a completed Application.

**3.1.4. When Required, Applicant and Electrical Corporation Commit to Additional Interconnection Study Steps.** When an Initial Review reveals that the proposed facility cannot be interconnected to the Electrical Corporation's system by means of a Simplified Interconnection pursuant to Section 4 and Appendix B, and that significant Electrical Corporation Interconnection Facilities or Distribution System Improvements must be installed or made to the Electrical Corporation's electric system to accommodate the interconnection of an Applicant's generating facility, the Electrical Corporation and Applicant shall enter into an agreement that provides for the Electrical Corporation to perform such additional studies, facility design, and engineering and to provide detailed cost estimates for fixed price or actual cost billing, to the Applicant at the Applicant's expense. The Interconnection Study Agreement shall set forth the Electrical Corporation's schedule for completing such work and the estimated or fixed price costs of such studies and engineering. Upon completion of an Interconnection Study, the Electrical Corporation shall provide the Applicant with the specific requirements, costs and schedule for interconnecting the Generating Facility to accommodate execution of agreements pursuant to Section 3.1.5.

3.1.5 Applicant and Electrical Corporation Enter Into a Generation Interconnection Agreement and, Where Required, a Financing and Ownership Agreement for Interconnection Facilities or Electric System Modifications. The Electrical Corporation shall provide the Applicant with an executable version of the Interconnection Agreement, Net Energy Metering Agreement, or Power Purchase Agreement appropriate for the Applicant's Generating Facility and desired mode of operation. Where the Initial Review or Interconnection Study performed by the Electrical Corporation has determined that modifications or additions are required to be made to its Electric System, or that additional metering, monitoring, or protection devices will be necessary to accommodate a Applicant's Generating Facility, the Electrical Corporation shall also provide the Applicant with an Interconnection Facilities Financing and Ownership Agreement (IFFOA). The IFFOA shall set forth the respective parties' responsibilities, completion schedules, and estimated or fixed price costs for the required work.

3.1.6 Electricity Producer Installs or Constructs the Generating Facility; Where Applicable, Electrical Corporation or Electricity Producer Installs Required Interconnection Facilities or Modifies Electrical Corporation's Electric System. After executing the appropriate Generation Interconnection or Power Purchase Agreement, and where required, the IFFOA, the Electricity Producer may install or construct its Generating Facility in accordance with the provisions of this rule and the terms of the specific agreements formed between the Electricity Producer and the Electrical Corporation. Where appropriate, the Electrical Corporation will commence construction/installation of the system modifications and/or metering and monitoring requirements identified in the IFFOA. The parties will use good faith efforts to meet the schedules and fixed costs or estimated costs in the IFFOA.

3.1.7 Electricity Producer Arranges for and Completes Testing of Generating Facility and, Where Applicable, Electricity Producer Installed Interconnection Facilities. New Generating Facilities and associated Interconnection Facilities must be tested to ensure compliance with the safety and reliability provisions of

the CPUC-approved rules and regulations prior to being operated in parallel with the Electrical Corporation's electric system. Certified Equipment will be subject to the tests specified in Section 4. For non-Certified Equipment, the Electricity Producer will develop a written testing plan to be submitted to the Electrical Corporation for its review and acceptance. Alternatively, the Electricity Producer and Electrical Corporation may agree to have the Electrical Corporation conduct the required testing at the Electricity Producer's expense. Where applicable, the test plan shall include the installation test procedure(s) published by the manufacturer(s) of the generation or interconnection equipment. Facility testing shall be conducted at a mutually agreeable time, and depending on who conducts the tests, the Electrical Corporation or Electricity Producer shall be given the opportunity to witness the tests.

**3.1.8 Electrical Corporation Authorizes Interconnection.** The Electricity Producer's Generating Facility shall be allowed to commence parallel operation with the Electrical Corporation's electric system upon satisfactory compliance with the terms of the Generation Interconnection Agreement, Power Purchase Agreement or Net Energy Metering Agreement. Compliance may include, but not be limited to, provision of any required documentation and satisfactorily completing any required inspections or tests as described herein or in the agreements formed between the Electricity Producer and the Electrical Corporation. An Electricity Producer shall not interconnect a Generating Facility unless it has received the Electrical Corporation's express written permission to do so.

**3.1.9 Electrical Corporation Reconciles Costs and Payments.** If the Electricity Producer selected a fixed price cost for the Interconnection Facilities or Electric System Modifications, no reconciliation will be necessary. If the Electricity Producer selected actual cost billing, a true-up will be required. Within a reasonable time after the interconnection of a Electricity Producer's Generating Facility, the Electrical Corporation will reconcile its actual costs related to the Electricity Producer's facility against the application fee and any other advance payments made by the Electricity Producer. The Electricity Producer will receive either a bill for any balance due or a reimbursement for overpayment as determined by the Electrical Corporation's reconciliation. The Electricity Producer shall be entitled to a reasonably detailed and understandable report detailing the Electrical Corporation's reconciliation process.

## **4. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS**

### **4.1 General Interconnection and protection requirements**

4.1.1 Protective Functions shall be equipped with automatic means to prevent the Generating Facility from re-energizing a de-energized Distribution System circuit.

4.1.2 The Generating Facility and associated Protective Functions shall not contribute to the formation of an Unintended Island.

4.1.3 The Electricity Producer's protection and control diagrams for the interconnection shall be approved by the Electrical Corporation prior to completion of the Generating Facility Interconnection, unless the Electricity Producer uses a protection and control scheme previously approved by the

Electrical Corporation for system-wide application or uses only Certified Equipment.

4.1.4 Protective Functions shall be equipped with automatic means to prevent reconnection of the Generating Facility with the Distribution System unless the Distribution System service voltage and frequency is of specified settings and is stable for 60 seconds.

4.1.5 Certified Equipment contains certified functions that are accepted by all California Electrical Corporations. This equipment may be installed on a Distribution System in accordance with an Interconnection control and protection scheme approved by the Electrical Corporation.

4.1.6 These requirements are designed to protect the Electrical Corporation's Distribution System and not the Generating Facility. An Electricity Producer shall be solely responsible for providing adequate protection for the Electricity Producer's Generating Facility and Interconnection Facilities connected to the Electrical Corporation's Distribution System. The Electricity Producer's protective equipment shall not impact the operation of other protective devices utilized on the Distribution System in a manner that would affect the Electrical Corporation's capability of providing reliable service to Customers.

4.1.7 Circuit breakers or other interrupting devices at the Point of Common Coupling must be Certified or "Listed" (as defined in Article 100, the Definitions Section of the National Electrical Code) as suitable for the application. This includes being capable of interrupting maximum available fault current. The Generating Facility shall be designed so that the failure of any one device shall not potentially compromise the safety and reliability of the Distribution System.

4.1.8 The Electricity Producer will furnish and install a manual disconnect device that has a visual break to isolate the Generating Facility from the Distribution System. The device must be accessible to Electrical Corporation personnel and be capable of being locked in the open position. Generating Facilities with non-islanding inverters totaling 1kVA or less are exempt from this provision.

**4.2 Prevention of interference.** The Electricity Producer shall not operate equipment that superimposes upon the Distribution System a voltage or current that interferes with Electrical Corporation operations, service to Electrical Corporation customers, or Electrical Corporation communication facilities. If such interference occurs, the Electricity Producer must diligently pursue and take corrective action at its own expense after being given notice and reasonable time to do so by the Electrical Corporation. If the Electricity Producer does not take timely corrective action, or continues to operate the equipment causing interference without restriction or limit, the Electrical Corporation may, without liability, disconnect the Electricity Producer's equipment from the Distribution System, in accordance with Section 2.9 of this rule.

To eliminate undesirable interference caused by operation of the Generating Facility, each Distributed Generator in a Generating Facility shall meet the following criteria:

**4.2.1 Normal voltage operating range.** The voltage operating range for Distributed Generators shall be selected as a protection function that responds to abnormal Distribution System conditions and not as a voltage regulation function.

4.2.1.1 **Small systems (11 kVA or less).** Distributed Generator systems of 11 kVA capacity or less shall be capable of operating within the limits normally experienced on the Distribution System. The operating window shall be selected in a manner that minimizes nuisance tripping and range between 106 volts and 132 volts (88-110% of nominal voltage) on a 120-volt base. Generating Facilities shall cease to energize the Electrical Corporation lines whenever the voltage at the PCC deviates from the allowable voltage operating range.

4.2.1.2 **Systems larger than 11 kVA.** Electrical Corporations may have specific operating voltage ranges for larger Distributed Generator units, and may require adjustable operating voltage settings for these larger systems. In the absence of such requirements, the above principles of operating between 88% and 110% of the appropriate interconnection voltage should be followed.

4.2.1.3 **Voltage Disturbances.** System voltage assumes a nominal 120 V base. For the convenience of those wishing to translate these guidelines to voltage bases other than 120 volts, the limits will also be provided as approximate percentages. The Distributed Generator should sense abnormal voltage and respond. The following conditions should be met, with voltages in RMS and measured at the Point of Common Coupling:

Voltage at Point of Common Coupling	Maximum Trip Time (Assuming 60 Cycles per Second)
Less than 60 Volts	10 Cycles
Greater than 60 volts but less than 106 volts	120 Cycles
Greater than 106 volts but less than 132 volts	Normal Operation
Greater than 132 volts but less than 165 volts	120 Cycles (30 cycles for facilities greater than 11kVA)
Greater than 165 volts	6 Cycles

*\*"Trip time" refers to the time between the abnormal condition being applied and the Distributed Generator unit ceasing to energize the Distribution System. Certain circuits will actually remain connected to the Distribution System to allow sensing of electrical conditions for use by the "reconnect" feature. The purpose of the allowed time delay is to ride through short-term disturbances to avoid excessive nuisance tripping. For systems of 11 kVA peak capacity or less, the above set points are to be non-user adjustable. For Distributed Generator units larger than 11 kVA, different voltage set points and trip times from those in Table 4.1 may be negotiated with the interconnecting Electrical Corporation.*

4.2.2 **Flicker.** Any voltage flicker at the Point of Common Coupling caused by the Generating Facility should not exceed the limits defined by the "Maximum Borderline of Irritation Curve" identified in IEEE 519 (*IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems*, IEEE STD 519-1992, Institute of Electrical and Electronic Engineers, Piscataway, NJ. April 1992. This requirement is necessary to minimize the adverse voltage effects to other customers on the Distribution System. Induction generators may be connected and brought up to synchronous speed (as an induction motor) provided these flicker limits are not exceeded.

**4.2.3 Frequency.** The Electrical Corporation controls system frequency, and the Distributed Generator unit shall operate in synchronism with the Distribution System. Small Distributed Generators should have a fixed operating frequency range of 59.3-60.5 Hertz. Electrical Corporations may require adjustable operating frequency settings for systems larger than 11 kVA to assist the system during serious capacity shortages. For systems larger than 11 kVA, low frequency settings of 59.3 Hz and 58.0 Hz may be used with the consent of the Electrical Corporation.

**4.2.4 Harmonics.** Harmonic distortion shall be in compliance with IEEE 519. Exception: The harmonic distortion of a Distributed Generator at a Customer's site shall be evaluated using the same criteria as the loads at that site.

**4.2.5 Direct Current Injection.** The Distributed Generator should not inject Direct Current greater than 0.5% of rated output current into the Distribution System under either normal or abnormal operating conditions.

**4.2.6 Power Factor.** Each Distributed Generator in a Generating Facility shall be capable of operating at some point within a range of a power factor of 0.9 (either leading or lagging). Operation outside this range is acceptable provided the reactive power of the Generating Facility is used to meet the reactive power needs of on-site loads or that reactive power is otherwise provided under tariff by the Electrical Corporation. The Electricity Producer shall notify the Electrical Corporation if is using the Generating Facility for power factor correction.

### **4.3 Control, protection and safety equipment requirements**

#### **4.3.1 Basic Requirements**

**4.3.1.1 Protective function requirements.** The Protective Functions of a Generating Facility must include a visual open disconnect device (except as exempted in Section 4.1.8), a fault-interrupting device, an over/under voltage trip function, and an over/under frequency trip function.

**4.3.1.2 Limits specific to single-phase generators.** For single-phase generators connected to a shared single-phase secondary, the maximum capacity shall be 20 kVA. Distributed Generators applied on a center-tap neutral 240-volt service must be installed such that no more than 6 kVA of imbalance in capacity exists between the two sides of the 240-volt service. For dedicated distribution transformer services, the limit of a single-phase Distributed Generator shall be the transformer nameplate rating.

#### **4.3.2 Technology Specific Requirements**

**4.3.2.1 Three-phase synchronous generators.** The Distributed Generator circuit breakers shall be three-phase devices with electronic or electromechanical control. The Electricity Producer shall be responsible for properly synchronizing its Generating Facility with the Distribution System by means of either a manual or automatic synchronizing function. Automatic synchronizing is required for all synchronous generators, which have a Short Circuit Contribution Ratio (SCCR) exceeding 0.05. A Generating Facility whose SCCR exceeds 0.05 shall be equipped with Protective Functions suitable for detecting loss of synchronism and rapidly disconnecting the Generating Facility from the Distribution System. Unless otherwise agreed to between the Electricity Producer and the Electrical

Corporation, synchronous generators shall automatically regulate power factor, not voltage, while operating in parallel with the Distribution System.

**4.3.2.2 Induction Generators.** Induction Generators do not require separate synchronizing equipment. Starting or rapid load fluctuations on induction generators can adversely impact the Distribution System's voltage. Corrective step-switched capacitors or other techniques may be necessary and may cause undesirable ferroresonance. When these counter measures (e.g. additional capacitors) are installed on the Electricity Producer's side of the Point of Common Coupling, the Electrical Corporation must review these measures. Additional equipment may be required to resolve this problem as a result of an Interconnection Study.

**4.3.2.3 Inverter Systems.** Utility-interactive inverters do not require separate synchronizing equipment. Non-utility-interactive stand-alone inverters shall not be used for parallel operation with the Distribution System.

#### **4.3.3 Initial Review Process**

Appendix A of this Rule defines the Initial Review process. The Initial Review process evaluates the specific characteristics of the Interconnection, including those specific to the location of the Generating Facility, and whether additional requirements are necessary.

#### **4.3.4 Supplemental DG Requirements**

**4.3.4.1 Unintended Islanding For DG that fail the Export Screen.** Generating Facilities must mitigate their potential contribution to an Unintended Island. This can be accomplished by one of the following options:

- (1) incorporating certified non-islanding control functions into the Protective Functions, or
- (2) verifying that local loads sufficiently exceed the load carrying capability of the Generating Facility, or
- (3) transfer trip or equivalent function.

**4.3.4.2 Fault Detection.** A Generating Facility with an SCCR exceeding 0.1 or that does not meet any one of the options for detecting Unintended Islands in 4.4.4.1 shall be equipped with Protective Functions designed to detect Distribution System faults, both line-to-line and line-to-ground, and promptly remove the Generating Facility from the Distribution System in the event of a fault. For a Generating Facility that cannot detect these faults within two seconds, transfer trip or equivalent function may be required. Reclose-blocking of the Electrical Corporation's affected recloser(s) may also be required by the Electrical Corporation for generators that exceed 15% of the peak load on the Line Section.

**4.3.5 Generating Facility types and conditions not identified. In the event that Section 4 of this rule does not address the interconnection requirements of a Generating Facility, the Electrical Corporation and Electricity Producer**

**may interconnect a Generating Facility using mutually agreed upon technical requirements.**

## **5. INTERCONNECTION FACILITY OWNERSHIP AND FINANCING**

### **5.1 Scope and Ownership of Interconnection Facilities**

**5.1.1 Scope.** The interconnection of an Electricity Producer's Generating Facility with Electrical Corporation's Distribution System is made through the use of Interconnection Facilities. Such interconnection may also require Distribution System Improvements. The nature, extent and costs of Interconnection Facilities and Distribution System Improvements shall be consistent with this Rule and determined through the Initial Review and/or Interconnection Studies described in Section 3.

**5.1.2 Ownership.** Subject to the limitations set forth in this Rule, Interconnection Facilities which may be installed on Electricity Producer's side of the Point of Common Coupling may be owned, operated and maintained by the Electricity Producer or Electrical Corporation. Interconnection Facilities installed on Electrical Corporation's side of the Point of Common Coupling and Distribution System Improvements may be owned operated and maintained only by Electrical Corporation.

### **5.2 Responsibility for Costs of Interconnecting a Generating Facility**

**5.2.1 Study and Review Costs.** An Electricity Producer shall be responsible for the reasonably incurred costs of the Initial Review and any Interconnection Studies conducted pursuant to Section 3.2 of this Rule solely to explore the feasibility and determine the requirements of interconnecting a Generating Facility with Electric Corporation's Distribution System.

**5.2.2 Facility Costs.** An Electricity Producer shall be responsible for all costs associated with Interconnection Facilities owned by the Electricity Producer. The Electricity Producer shall also be responsible for any costs reasonably incurred by Electrical Corporation in providing, operating, or maintaining Interconnection Facilities and Distribution System Improvements required solely for the interconnection of the Electricity Producer's Generating Facility with Electrical Corporation's Distribution System.

**5.2.3 Separation of Costs.** Should Electrical Corporation combine the installation of Interconnection Facilities, or Distribution System Improvements with modifications or additions to the Electrical Corporation's Distribution System to serve other Customers or Electricity Producers, Electricity Corporation shall not include the costs of such separate or incremental facilities in the amounts billed to the Electricity Producer for the Interconnection Facilities or Distribution System Improvements required pursuant to this Rule.

### **5.3 Installation and Financing of Interconnection Facilities Owned and Operated by Electrical Corporation**

**5.3.1 Agreement Required.** Costs for Special Facilities shall be paid by Electricity Producer pursuant to the provisions contained in the Interconnection Agreement or, where the nature and extent of the Interconnection Facilities and Distribution System Improvements warrant additional detail, in a separate

Interconnection Facility Financing and Operating Agreement between the Electricity Producer and Electrical Corporation, and Electrical Corporation's applicable tariffs and rules for Special Facilities.

**5.3.2 Attachments and Modifications to Distribution System.** Except as provided for in Section 5.3.3 of this Rule, Interconnection Facilities connected directly to Electrical Corporation's Distribution System and Distribution System Improvements shall be provided, installed, owned and maintained by Electrical Corporation as Special Facilities.

**5.3.3 Third-Party Installations.** Subject to the approval of Electrical Corporation, an Electricity Producer may, at its option, employ a qualified contractor to provide and install Interconnection Facilities or Distribution System Improvements to be owned and operated by Electrical Corporation. Such Interconnection Facilities and Distribution System Improvements shall be installed in accordance with Electrical Corporation's design and specifications. Upon final inspection and acceptance by Electrical Corporation, the Electricity Producer shall transfer ownership of such Electricity Producer installed Interconnection Facilities or Distribution System Improvements to Electrical Corporation and such facilities shall thereafter be owned and maintained by Electrical Corporation at Electricity Producer's expense as Special Facilities. The Electricity Producer shall pay the Electrical Corporation's reasonable costs of design, administration, and monitoring the installation of such facilities to ensure compliance with Electrical Corporation's requirements. Electricity Producer shall also be responsible for all costs, including any income tax liability, associated with the transfer of Electricity Producer installed Interconnection Facilities and Distribution System Improvements to Electrical Corporation.

**5.3.4 Reservation of Unused Facilities.** When a Electricity Producer wishes to reserve Electrical Corporation-owned Interconnection Facilities or Distribution System Improvements installed and financed as Special Facilities for the Electricity Producer, but idled by a change in the operation of the Electricity Producer's Generating Facility or otherwise, Electricity Producer may elect to abandon or reserve such facilities consistent with the terms of its Interconnection Facility Financing and Operating Agreement with Electrical Corporation. If Electricity Producer elects to reserve idled Interconnection Facilities or Distribution System Improvements, Electrical Corporation shall be entitled to continue to charge Electrical Producer for the costs related to the ongoing operation and maintenance of the Special Facilities.

**5.3.5 Refund of Salvage Value.** When a Electricity Producer elects to abandon the Special Facilities for which it has either advanced the installed costs or constructed and transferred to the Electrical Corporation, the Electricity Producer shall, at a minimum, receive from the Electrical Corporation a credit for the net salvage value of the Special Facilities.

## **6. METERING, MONITORING AND TELEMETRY**

**6.1 General Requirements.** All Generating Facilities shall be metered in accordance with this Section 6 and shall meet all applicable standards of the Electrical Corporation contained in the Electrical Corporation's applicable tariffs and published Electrical Corporation manuals dealing with metering specifications. The requirements in this Section 6 do not apply to metering of Generating Facilities operating under the Electrical Corporation's net metering tariff pursuant to California Public Utilities Code Section 2827.

**6.2 Metering by non-Electrical Corporation Parties.** The ownership, installation, operation, reading, and testing of metering for Generating Facilities shall be by the Electrical Corporation except to the extent that the CPUC has determined that all these functions, or any of them, may be performed by a non-Electrical Corporation as authorized by the CPUC.

**6.3 Net Generation Metering.** For purposes of monitoring Generating Facility operation for determination of standby charges and applicable non-bypassable charges as defined in Electrical Corporation's tariffs, and for Distribution System planning and operations, consistent with Section 2.4 of these Rules, the Electrical Corporation shall have the right to specify the type, and require the installation of, Net Generation Metering. The Electrical Corporation shall require the provision of generator output data to the extent reasonably necessary to provide information for the utility to administer its tariffs or to operate and plan its system. The Electrical Corporation shall only require Net Generation Metering to the extent that less intrusive and/or more cost effective options for providing the necessary generator output data are not available. In exercising its discretion to require Net Generation Metering, the Electrical Corporation shall consider all relevant factors, including but not limited to:

1. Data requirements in proportion to need for information;
2. Customer election to install equipment that adequately addresses the Electrical Corporation's operational requirements;
3. Accuracy and type of required metering consistent with purposes of collecting data;
4. Cost of metering relative to the need for and accuracy of the data;
5. The project's size relative to the cost of the metering/monitoring;
6. Other means of obtaining the data (e.g. generator logs, proxy data etc.);
7. Requirements under any power purchase agreement with the customer.

The Electrical Corporation will report to the CPUC or designated authority, on a quarterly basis, the rationale for requiring net generation equipment in each instance along with the size and location of the facility.

**6.4 Point of Common Coupling Metering.** For purposes of assessing Electrical Corporation charges for retail service, the Electricity Producer's Point of Common Coupling Metering shall be a bi-directional meter so that power deliveries to and from the Electricity Producer's site can be separately recorded. Alternately, the Electricity Producer may, at its sole option and cost, require the Electrical Corporation to install multi-metering equipment to separately record power deliveries to the Distribution System and retail purchases from the Electric Corporation. Such Point of Common Coupling Metering shall be equipped with detents to prevent reverse registration.

**6.5 Telemetering.** If the nameplate rating of the Generating Facility is 1 MW or greater, Telemetering equipment at the Net Generator Metering location may be required at the Electricity Producer's (and Customer's) expense. If the Generating Facility is interconnected to a Distribution System operating at a voltage below 10kV, then Telemetering equipment may be required on Generating Facilities 250 kW or greater.

The Electrical Corporation shall only require Telemetry to the extent that less intrusive and/or more cost effective options for providing the necessary data in real time are not available. The Electrical Corporation will report to the CPUC or designated authority, on a quarterly basis, the rationale for requiring telemetry equipment in each instance along with the size and location of the facility.

**6.6 Sunset Provision.** Sections 6.3 and 6.4 are interim provisions only. The Electrical Corporation shall file permanent metering requirements with the CPUC on or by December 31, 2002. At that time, the Electrical Corporation shall serve its application for approval of permanent metering requirements on the service list in Rulemaking 99-10-025.

**6.7 Location.** Where Electrical Corporation-owned metering equipment is located on the Electricity Producer's (or Customer's) premises, Electricity Producer (and Customer) shall provide, at no expense to the Electrical Corporation, a suitable location for all such metering equipment.

**6.8 Costs of Metering.** The Electricity Producer (and Customer) will bear all costs of the metering required by this Rule 21, including the incremental costs of operating and maintaining the Metering.

## **7. DISPUTE RESOLUTION PROCESS**

7.1 The CPUC shall have initial jurisdiction to interpret, add, delete or modify any provision of this Rule or of any agreements entered into between the Electrical Corporation and the Electricity Producer to implement this tariff ("the implementing agreements") and to resolve disputes regarding the Electrical Corporation's performance of its obligations under its electric rules and tariffs, the implementing agreements, and requirements related to the interconnection of the Electricity Producer's Facilities pursuant to this Rule .

7.2 Any dispute arising between the Electrical Corporation and the Electricity Producer (individually "Party" and collectively "the Parties") regarding the Electrical Corporation's performance of its obligations under its electric rules and tariffs, the implementing agreements, and requirements related to the interconnection of Producer's Facilities pursuant to this Rule shall be resolved according to the following procedures.

7.2.1 The dispute shall be reduced to writing by the aggrieved Party in a letter ("the dispute letter") to the other Party containing the relevant known facts pertaining to the dispute, the specific dispute and the relief sought, and express notice by the aggrieved Party that it is invoking the procedures under Section 7.2. Within 45 calendar days of the date of the dispute letter, the Parties' authorized representatives will be required to meet and confer to try to resolve the dispute.

7.2.2 If the Parties do not resolve their dispute within 45 calendar days after the date of the dispute letter, the dispute shall, upon demand of either party, be submitted to resolution before the Commission in accordance with the Commission's rules, regulations and procedures applicable to the resolution of such disputes.

7.3 Pending resolution of any dispute under this section, the Parties shall proceed diligently with the performance of their respective obligations under this Rule and the implementing agreements, unless the implementing agreements have been terminated.

7.4 Disputes as to the application and implementation of this section shall be subject to resolution pursuant to the procedures set forth in this section.

## 8. DEFINITIONS

**Active Anti-Islanding Scheme:** A control scheme installed with the Generating Facility that senses and prevents the formation of an Unintended Island.

**Applicant:** The entity submitting an Application for Interconnection.

**Application:** The standard form CPUC-approved document submitted to the Electrical Corporation for electrical interconnection of a Generator with the Electrical Corporation.

**Certification Test;** A test adopted by an Electrical Corporation that verifies conformance of certain equipment with CPUC-approved performance standards in order to be classified as Certified Equipment. Certification Tests are normally performed by approved laboratories such as the Underwriter's Lab (UL).

**Certification; Certified:** The results of a successful Certification Testing. (Note: The details about the certification process will be part of a Supplemental Report.

**Certified Equipment:** Equipment that has passed the Certification Test.

**CPUC:** The Public Utilities Commission of the State of California.

**Customer:** The entity that receives or is entitled to receive Distribution Services through the Distribution System.

**Dedicated Transformer:** A transformer that provides Electricity Service to a single Customer. The Customer may or may not have a Generating Facility.

**Distributed Generation:** Electrical power generation by any means, including from stored electricity, that is interconnected to an Electrical Corporation at a Point of Common Coupling under the jurisdiction of the CPUC.

**Distributed Generator:** An individual electrical power plant, including required equipment, appurtenances, protective equipment and structures, that is capable of Distributed Generation.

**Distribution Service:** All services required by, or provided to, a Customer pursuant to the approved tariffs and rules of the Electrical Corporation.

**Distribution System Island:** A condition on the Distribution System in which one or more Distributed Generator(s), over which the utility has no direct control, and a portion of the Distribution System operate while isolated from the remainder of the Distribution System.

**Distribution System:** All electrical wires, equipment, and other facilities owned or provided by the Electrical Corporation by which an Electrical Corporation provides Distribution Service to its Customers.

**Electrical Corporation:** The entity that, under the jurisdiction of the CPUC, is charged with providing Electricity Distribution Service to the Customer.

**Electricity Producer:** The entity that executes an Interconnection Agreement with the Electrical Corporation. The Electricity Producer may or may not own or operate the Generating Facility, but is responsible for the rights and obligations related to the Interconnection Agreement.

**Emergency:** An actual or imminent condition or situation, which jeopardizes the Distribution System Integrity.

**Field Testing:** Testing performed in the field to determine whether equipment meets the Electrical Corporation's requirements for safe and reliable Interconnection

**Generating Facility:** All Distributed Generators that are included in an Interconnection Agreement.

**Gross Nameplate Rating:** The total gross generating capacity of the Distributed Generator as designated by the manufacturer of the Distributed Generator.

**Host Load:** Electrical power that is consumed by the Customer at the property on which the Generating Facility is located.

**Initial Operation:** The first time the Generating Facility is in Parallel Operation.

**Initial Review:** The review by the Electrical Corporation, following receipt of an Application, to determine the following:

- a. If an Application qualifies for Simplified Interconnection, or
- b. If an Application can be made to qualify for Interconnection with supplemental review determining any potential additional requirements, or
- c. If an Interconnection Study is required, the cost estimate and schedule for performing the Interconnection Study.

**Interconnection Agreement:** An agreement between the Electrical Corporation and the Electricity Producer that gives each the certain rights and obligations to effect or end Interconnection.

**Interconnection Study:** A study to establish the requirements for Interconnection of an Electricity Producer.

**Interconnection; (Interconnected):** The physical connection of Distributed Generation in accordance with the requirements of these rules so that Parallel Operation with the utility system can occur (has occurred).

**Interconnection Facilities:** The electrical wires, switches and related equipment, that interconnect a Generating Facility to the Distribution System.

**Island; Islanding:** A condition on the Distribution System in which one or more Generating Facilities , deliver power to Customers using a portion of the Distribution System that is electrically isolated from the remainder of the Distribution System.

**ISO:** The California Independent System Operator, responsible for the management of electrical power flow through California's electrical transmission network.

**Line Section:** That portion of the Distribution System connected to a Customer bounded by automatic sectionalizing devices or the end of the line.

**Metering Equipment:** All equipment, hardware, software including meter cabinets, conduit, etc. that is necessary for Metering.

**Metering:** The measurement of electrical power flow in kW and/or kWh, and, if necessary, kVAR at a point, and its display to the Electrical Corporation, as required by this rule.

**Net Energy Metering:** Metering for the mutual purchase and sale of electricity between the Electricity Producer and the Electrical Corporation pursuant to the net metering tariff approved by the CPUC.

**Net Generation Metering:** The Metering of the net electrical energy output in kW and kWh from a given Generating Facility. This may also be the measurement of the difference between the total electrical energy produced by a Distributed Generator and the electrical energy consumed by the auxiliary equipment necessary to operate the Distributed Generator. For a Distributed Generator with no Host Load and/or Section 218 Load, Metering that is located at the point of Common Coupling. For a Distributed Generator with Host Load and/or Section 218 Load, Metering that is located at the Distributed Generator bus after the point of auxiliary load(s) and prior to serving Host Load and/or Section 218 Load.

**Net Metering:** Where electricity at a point may flow in both directions, the measurement of the net, or the algebraic sum, of electrical energy in kWh, that flows through that point in a given time-interval. Net Metering typically uses two meters, or in some cases a single meter with two or more registers, to individually measure a Customer's electric deliveries to, and consumption of retail service from, the Distribution System. Over a given time frame (typically a month) the difference between these two values yield either net consumption or net surplus. The meter registers are ratcheted to prevent reverse registration. If available, a single meter may be allowed spin backward to yield the same effect as a two meter (or register) arrangement.

**Net Nameplate Rating:** The Gross Nameplate Rating minus the consumption of electrical power of the Distributed Generator as designated by the manufacturer(s) of the Distributed Generator.

**Network Service:** More than one electrical feeder providing Distribution Service at a Point of Common Coupling.

**Parallel Operation:** The simultaneous operation of a Distributed Generator with power delivered or received by the Electrical Corporation while Interconnected. For the purpose of this rule, Parallel Operation includes only those generators that are so interconnected with the Distribution System for more than 60 cycles.

**Point of Common Coupling Metering:** Metering located at the Point of Common Coupling. This is the same Metering as Net Generation Metering for Generating Facilities with no Host Load and/or Section 218 Load.

**Point of Common Coupling:** The transfer point for electricity between the electrical conductors of the Electrical Corporation and the electrical conductors of the Electricity Producer.

**Point of Interconnection:** The electrical transfer point between an electrical power plant and the electrical distribution system. This may or may not be coincident with the Point of Common Coupling.

**Power Purchase Agreement:** An agreement for the sale of electricity by the Electricity Producer to the Electrical Corporation.

**Protective Function(s):** The equipment, hardware and/or software in a Generating Facility (whether discrete or integrated with other functions) whose purpose is to protect against Unsafe Operating Conditions.

**Prudent Electrical Practices:** Those practices, methods, and equipment, as changed from time to time, that are commonly used in prudent electrical engineering and operations to design and operate electric equipment lawfully and with safety, dependability, efficiency, and economy.

**Scheduled Operation Date:** The date specified in the Interconnection Agreement when the Generating Facility is, by the Electricity Producer's estimate, expected to begin Initial Operation.

**Secondary Network:** A network supplied by several primary feeders suitably interlaced through the area in order to achieve acceptable loading of the transformers under emergency conditions and to provide a system of extremely high service reliability. Secondary networks usually operate at 600 V or lower.

**Section 218 Load:** Electrical power that is supplied in compliance with California Public Utilities Code (PU Code) section 218. PU Code 218 defines an "Electric Corporation" and provides conditions under which a generator transaction would not classify a generating entity as an Electric Corporation. These conditions relate to "over-the-fence" sale of electricity from a generator without using the Distribution System.

**Simplified Interconnection:** Interconnection conforming to the minimum requirements under these rules, as determined by Appendix A.

**Short Circuit Contribution Ratio (SCCR):** The ratio of the Generating Facility's short circuit contribution to the Electrical Corporation's short circuit contribution for a three-phase fault at the high voltage side of the distribution transformer connecting the Generating Facility to the Electrical Corporation's system.

**Special Facilities:** Those facilities installed at the Electricity Producer's request which the Electrical Corporation does not normally furnish under its tariff schedule; or a prorata portion of existing facilities requested by the Electricity Producer, allocated for the sole use of such an Electricity Producer, which would not normally be allocated for such sole use.

**Stabilization; Stability:** The return to normalcy of an Electrical Corporation Distribution System, following a disturbance. Stabilization is usually measured as a time period during which voltage and frequency are within acceptable ranges.

**System Integrity:** The condition under which a Distribution System is deemed safe and can reliably perform its intended functions in accordance with the safety and reliability rules of the Electrical Corporation.

**Telemetry:** The electrical or electronic transmittal of Metering data on a real-time basis to the Electrical Corporation.

**Unintended Island:** The creation of an island, usually following a loss of a portion of the Distribution System, without the approval of the Electrical Corporation.

**Unsafe Operating Conditions:** Conditions that, if left uncorrected, could result in harm to personnel, damage to equipment, loss of System Integrity or operation outside pre-established parameters required by the Interconnection Agreement.

## **RULE 21 APPENDIX A: INITIAL REVIEW PROCESS**

### **FOR APPLICATIONS TO INTERCONNECT DISTRIBUTED GENERATION**

#### **Introduction:**

This Initial Review Process was developed to create a path for selection and rapid approval of those Applications for Interconnection that do not require an Interconnection Study. The capitalized phrases used in this Appendix A have the same meanings as those in Section 8 of the proposed Rule 21.

#### **Purpose:**

The Initial Review determines:

- a. If an Application qualifies for Simplified Interconnection;
- b. If an Application can be made to qualify for Interconnection with supplemental review determining any potential additional requirements, or
- c. If an Interconnection Study is required, the cost estimate and schedule for performing the Interconnection Study.

#### **NOTE:**

Failure to pass any screen only means that further review, and/or studies, are required before the DG project will be approved for interconnection with the Electrical Corporation. It does not mean that the DG cannot interconnect.

### **INITIAL REVIEW PROCESS FLOW CHART**

Provide Completed Application.

Follow Net Metering Process (per P.U. Code Sec. 2827)

1. Does the DG qualify for net metering?

1.

2.

3. Will Power be exported across the PCC?

4. Is the Interconnection Equipment Certified for Application? or does Interconnection Equipment have Interim EC Approval?

5. Is the aggregate DG Capacity on the Line Section less than 15% of Line Section peak load?

6. Is the DG Capacity 11 kVA or less?
7. Is the Short Circuit Current Contribution screen met?
8. Is the Line Configuration screen met?

#### **INITIAL REVIEW PROCESS DETAILS:**

##### **1. Does the DG qualify for net metering?**

If YES, go to a separate process for net-metered DG (per P.U. Code Sec. 2827)

If NO, continue to next screen.

Significance:

1. Net-metered systems are covered by state legislation (refer to Section 2827 of the Public Utilities Code).

Criteria to Qualify for Net-Metering:

1. DG facility must comply with PUC Code Section 2827

##### **2. Is the Point of Common Coupling (PCC) on a Networked Secondary System?**

If NO, continue to next screen.

If YES, DG does not qualify for Simplified Interconnection.

Perform supplemental review.

Significance:

1. Special considerations must be given to DG on networked secondary distribution systems because of the design and operational aspects of network protectors. There are no such considerations for radial distribution systems.

##### **3. Will power be exported across the PCC?**

If YES, DG does not qualify for Simplified Interconnection.

Perform supplemental review.

If NO, DG must incorporate one of the following four options:

Option 1:

To insure power is never exported, a reverse power Protective Function must be implemented at the PCC.

Default setting shall be 0.1% (export) of transformer rating, with a maximum 2.0 second time delay.

Option 2:

To insure at least a minimum import of power, an under-power Protective Function must be implemented at the PCC.

Default setting shall be 5% (import) of DG Gross Nameplate Rating, with maximum 2.0 second time delay.

Option 3:

To limit the incidental export of power, all of the following conditions must be met:

- The aggregate DG capacity of the Generating Facility must be no more than 25% of the nominal ampere rating of the Customer's Service Equipment;
- The total aggregate DG capacity must be no more than 50% of the transformer rating (This capacity requirement does not apply to customers taking primary service without an intervening transformer);
- The DG must be certified as non-islanding.

Option 4:

To insure that the relative size (capacity) of the DG compared to facility load results in no export of power without the use of additional devices, the DG capacity must be no greater than 50% of the customer's verifiable minimum annual load.

Significance:

1. Electrical Corporation's system does not need to be studied for load-carrying capability or DG power flow effects on EC voltage regulators since on-site DG reduces EC load.
2. Permits use of reverse-power relaying at the PCC as positive anti-islanding protection.

**4. Is the Interconnection Equipment Certified for the Application or does the Interconnection Equipment have Interim EC Approval?**

If NO, DG does not qualify for Simplified Interconnection.

Perform supplemental review.

If YES, continue to next screen.

Significance:

1. The Electrical Corporation does not need to review, or test, the DG's protective function scheme. Site commissioning testing may still be required to insure that the system is connected properly and that the protective functions are working properly.

- Basic protective function requirements met.
- Harmonic distortion limits met.
- Synchronizing requirements met.
- Flicker limitation requirements met.
- Pf regulation requirements met.
- Non-islanding requirements met.
- If used, reverse power function requirement met.
- If used, under-power function requirement met.

**5. Is the aggregate DG Capacity on the Line Section less than 15% of Line Section Peak Load?**

If YES, continue to next screen.

If NO, perform supplemental review to determine cumulative impact on Line Section.

Significance:

1. Low penetration of DG will have a minimal impact on operation and load restoration.

**6. Is the DG Capacity 11 kVA or less?**

If YES, DG qualifies for Simplified Interconnection.

If NO, continue to next screen.

Significance:

1. DG has minimal impact on fault current levels and any potential line overvoltages from loss of system neutral grounding.

**7. Is Short Circuit Current Contribution screen met?**

If NO, DG does not qualify for Simplified Interconnection.

Perform supplemental review.

If YES, continue to next screen.

Short Circuit Current Contribution Screen:

A. At primary side (high side) of dedicated distribution transformer, for the specified feeder, the sum of the Short Circuit Contribution Ratios (SCCR) of all DG's on the feeder must be less than or equal to 0.1.

B. At secondary (low side) of a shared distribution transformer, the short circuit contribution of the proposed DG must be less than or equal to 2.5% of the interrupting rating of the Customer's Service Equipment.

Significance:

No significant DG impact on:

- Distribution System's short circuit duty
- Distribution System fault detection sensitivity
- Distribution System relay coordination
- Distribution System fuse-saving schemes

**8. Is the Line Configuration screen met?**

If NO, then DG does not qualify for Simplified Interconnection.

Perform supplemental review.

If Yes, then DG

Line Configuration Screen:

Identify primary distribution line configuration. Based on proposed interconnection type, determine from table whether DG passes screen.

Primary Distribution Line Type	Type of Interconnection to Primary Distribution Line	Result/Criteria
Three-phase, three wire	Any	Pass screen
Three-phase, four wire	Single-phase, line-to-neutral	Pass screen
Three-phase, four wire  (For any line that has such a section OR mixed 3 wire & 4 wire)	All others	To pass, aggregate DG Capacity must be less than or equal to 10% of Line Section Peak Load.

Significance:

1. If the Electrical Corporation's primary system is three-wire or the DG interconnection transformer is single-phase (line-to-neutral), then there is no concern about overvoltages to the Electrical Corporation's, or Customer, equipment caused by loss of system neutral grounding during the operating time of anti-islanding protection.

(END OF APPENDIX A)