

Recommendation  
regarding  
**DISTRIBUTED GENERATION  
INTERCONNECTION RULES**

Docket No. 99-DIST-GEN (2)  
CPUC Docket No. R-99-10-025

JUNE 2000  
P700-00-006



Gray Davis, *Governor*

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## ACKNOWLEDGEMENTS

The Energy Commission wishes to thank the staff and outside parties who have participated in this rulemaking to date. In particular, we express our deepest appreciation for the dedicated efforts of the following staff: Judy Grau, Pramod Kulkarni, Jeff Ogata, and Scott Tomashefsky. We also acknowledge the support of Jon Edwards and Joe Diamond, for contract management related to this proceeding, as well as Evelyn Beevers for administrative assistance. We also wish to thank the FOCUS team for their efforts under contract with the Energy Commission: Bill Brooks, Cris Cooley, Mike Edds, Edan Prabhu, and Chuck Whitaker.

Companies actively participating in the working group process included the following (one asterisk denotes parties filing comments on May 5, 2000, two asterisks for parties also filing comments on June 9, 2000):

California Air Resources Board  
California Manufacturers and Technology Association (CMTA)\*  
California Municipal Utilities Association (CMUA)\*  
California Independent System Operator (ISO)\*\*  
Capstone Turbine  
CPUC – Office of Ratepayer Advocates  
Coast Intelligen \*  
Cogeneration Association of California/Energy Producers and Users Coalition (CAC/EPUC)\*  
Engine World  
Enron \*  
Future Resources Associates  
Hetch Hetchy Water and Power  
Honeywell \*  
Intergy  
Los Angeles Department of Water and Power  
New Energy Inc. \*  
Pacific Gas and Electric \*\*  
Plug Power \*\*  
Polaris Group (The)  
Redding (City of)  
Resource Dynamics Corporation  
Riverside Public Utilities  
Southern California Edison \*  
San Diego Gas and Electric \*\*  
Sacramento Municipal Utilities District \*  
Sempra Energy  
Sierra Pacific Power Company \*  
Southern California Gas Company  
Solar Development Corporation  
University of California/California State University  
VFL Energy Technologies

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## INTRODUCTION

The Energy Commission is pleased to submit this report to the California Public Utilities Commission (CPUC) pursuant to Order Instituting Investigation OII 99-DIST-GEN(2) issued on November 3, 1999. The purpose of the report is to set forth an Energy Commission recommendation regarding the development of distributed generation interconnection rules. The recommendations are based upon whether these rules will remove barriers to distributed generation technologies entering the market.

The Energy Commission adopted this document at its regular business meeting held on June 14, 2000. The California Public Utilities Commission (CPUC) will further consider these recommendations in its current rulemaking investigating distributed generation (CPUC Docket R.99-10-025).

### Background

The adoption of D.99-10-065 and the opening of R.99-10-025 at the CPUC in October 1999 provided a procedural roadmap for addressing issues related to distributed generation. The decision was the result of collaborative efforts among the CPUC, the Energy Commission, and the Electricity Oversight Board. On November 3, 1999 the Energy Commission opened an investigation to identify barriers to the development of distributed generation technologies by utility interconnection and other rules, and then to develop, if possible, recommendations to remove those barriers. The Siting Committee (Committee) was assigned the task of developing these rules and subsequently bringing its recommendations for Energy Commission consideration. Based upon D.99-10-065, the Committee stated that this proceeding would address the following issues:

- Scope of technologies covered by the interconnection rules;
- Need for interim standards;
- Technical issues surrounding interconnection rules;
- Safety issues;
- Feasibility of type testing;
- Information and training for government agencies;
- Advanced communications and metering for scheduling and dispatch;
- Changes to utility tariffs explaining interconnection rules.

The Committee held a workshop in December 1999 to begin the investigation. Working group meetings facilitated by Energy Commission staff were held between January and March 2000 with follow-up discussions during April and May. The Energy Commission appreciates the

participation of more than 100 people in the process, providing a representation of a wide range of interests with respect to distributed generation and distribution competition.

## **Goal of the Report**

The goal of this report is to provide a formal recommendation to the CPUC with proposed rule language that could apply to all distributed generation customers seeking to interconnect with the three investor-owned utilities' distribution systems in California regulated by the CPUC. The recommendations in this report are based upon six key components: 1) an April 2000 Energy Commission staff workshop report documenting the results of work performed by technical and non-technical stakeholders since December 1999; 2) the results of a Siting Committee hearing held on April 25<sup>th</sup>, 3) 14 sets of stakeholder comments submitted on May 5<sup>th</sup>, 4) a May 2000 Committee recommendation on interconnection rules, 5) four sets of stakeholder comments submitted on June 9<sup>th</sup>, 6) consideration of the Committee recommendation at the June 14<sup>th</sup> business meeting, and 7) internal Committee discussions with staff throughout the process.

These recommendations are consistent with general principles that promote consumer choice and protect distribution system reliability:

- Rules, protocols, and processes should be clear and transparent.
- Rules should be technology neutral, except where differential requirements can be fully justified by safety or other legitimate concerns.
- A level playing field should be established for all distributed generation providers.
- Rules should be uniform throughout California, and nationwide if possible.
- Utility distribution companies should be fairly compensated for distribution services that support distributed generation installations and customers.

A general description of the workshop process and its applicability to the CPUC rulemaking was provided in the staff workshop report and will not be repeated here. Part I of this report will provide Energy Commission recommendations on each section of the proposed Rule 21; after a discussion which includes an overview of the section, a restatement of stakeholder concerns expressed in the workshop report, the May 5<sup>th</sup> and June 9<sup>th</sup> comments; a restatement of staff recommendations; and Energy Commission observations. Other issues targeted for a supplemental report to be filed in the latter part of this summer will be addressed in Part II. Part III summarizes the Energy Commission's recommendations to the CPUC. The report concludes with a discussion about next steps required in this process. Attachment A contains the proposed rule language endorsed by the Energy Commission.

## I. RULE 21 OVERVIEW AND DISCUSSION

Rule 21 is currently part of each investor-owned utility's tariff booklet, applicable to connections with parallel generation units identified as *Qualifying Facilities*.<sup>1</sup> The Energy Commission, the Committee, staff, and the working groups have assumed throughout this effort that the language developed in this process will eventually replace the existing Rule 21 text.

The proposed Rule 21 contains eight sections and one appendix (see Table 1). The rule begins in Section 1 with a statement on applicability, followed by the general rules and obligations of both the DG customer and the utility (Section 2). The heart of the Rule is contained in Sections 3 and 4, which describe the non-technical and technical considerations for completing an interconnection agreement. Specific technical details on the screening procedures is detailed in the Appendix. Ownership and operational considerations, as well as procedures for settling disputes, are addressed in Sections 5-7. The rule ends with a common set of definitions to ensure consistency in the rule language.

|    |   |
|----|---|
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The remainder of this part describes the intent of each Rule 21 section, followed by a discussion of issues of concern addressed by the working groups in the development of the rule language. Each section concludes with an Energy Commission recommendation. The major subtopics of the rule language are shown in italics. The proposed Rule 21 language can be found in Attachment A of this report.

### Section 1 – Applicability and Introduction

1.1 *Applicability*

1.2 *Definitions*

1.3 *Enabling Documents*

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<sup>1</sup> A *Qualifying Facility* is defined to be a Generating Facility meeting the criteria for a QF defined under the Code of Federal Regulations, Title 18, Chapter 1, Section 292, Subpart B of the Federal Energy Regulatory Commission's regulations.

The main objective of this section is to generally identify parties that are subject to Rule 21. In the context of the OIR, the rule applies to all *Generating Facilities* that seek to interconnect with an electricity distribution system subject to CPUC jurisdiction. While the CPUC does not have jurisdiction over municipalities and irrigation districts, several municipality representatives have participated in this process, recognizing the importance of developing a statewide standard applicable to all electrical corporations in California.

In much the same way that jurisdiction has been conferred on the CPUC over California's investor-owned utilities, respective boards and councils have been provided general authority under the California Constitution and Public Utilities Code to establish policy for publicly-owned utilities, and to provide for their regulation. This dual regulatory framework was reaffirmed in Assembly Bill 1890 (Statutes of 1996, Chapter 854), where key restructuring decisions were left to the local regulatory bodies of publicly owned utilities. With regard to interconnection rules for distributed generation, neither the CPUC nor the Energy Commission has jurisdiction over publicly-owned utilities. However, publicly-owned utilities have previously collaborated with the CPUC, the Energy Commission and the investor-owned utilities in the development of standards and rules, and publicly-owned utilities routinely look to standards set by the CPUC for guidance in establishing their own standards.

### ***Staff Recommendation from the April 2000 Workshop Report***

Staff recommends endorsing the language contained in Section 1.

### ***Comments Filed by Stakeholders and Discussion***

Parties did not express any major concerns regarding Section 1. The only party commenting on the content of the section was SDG&E. The utility argues in its comments that the proposed Rule may not apply to some DG projects "due to FERC jurisdictional issues." As such, further discussion is recommended to define applicability in this section.

The Energy Commission believes that SDG&E's concern is not relevant to the development of rule language in this proceeding. DG projects that are under FERC jurisdiction should not be subject to the interconnection rules developed here. As the language in Section 1.1 indicates, the rules apply to facilities that are connected to distributed systems "over which the California Public Utilities Commission (CPUC) has jurisdiction." In the Energy Commission's opinion, applicability is clearly defined in the proposed rule language. As such, we endorse the language contained in Section 1.

## **Section 2 – General Rules, Rights, and Obligations**

- 2.1 *Authorization Required to Interconnect*
- 2.2 *Separate Arrangements Required for Other Services*
- 2.3 *Transmission Service Not Provided with Interconnection*
- 2.4 *Compliance with Laws, Rules, and Tariffs*
- 2.5 *Design Reviews and Inspections*
- 2.6 *Right to Access*
- 2.7 *Confidentiality of Information*
- 2.8 *Prudent Operation and Maintenance Required*

## 2.9 *Curtailement and Disconnection*

This section provides the general rules applicable not only to the interconnection application process but also procedures associated with the design, safe operation, curtailment, and disconnection provisions of the interconnection. It begins by explaining the need for an *Electricity Producer* to comply with Rule 21, followed by the requirement for having the utility provide written authorization before the interconnection can become operational. After stating that other distribution and transmission-related utility services require separate agreements, the section addresses the need to comply with appropriate CPUC-approved tariff rules and regulations, and comply with appropriate local, state, federal, statutes or regulations. Access rights to the *Electricity Producers'* facility and data confidentiality issues are then addressed as well as the need to ensure that the utility system is not compromised because of the interconnection. The section ends with a discussion of provisions required for disconnection or curtailment.

### ***Staff Recommendation from the April 2000 Workshop Report***

Staff recommends: 1) endorsing the rule language applicable to all portions of Section 2; and 2) ruling on Sections 2.4, 2.7, and 2.10 (compliance with laws, rules, and tariffs; data confidentiality; and curtailment issues) after reviewing the results of the April 25<sup>th</sup> Committee hearing and stakeholder comments. This recommendation was based on a staff belief that the basic principles surrounding the development of Section 2 were generally accepted by the working groups in their deliberations and a myriad of concerns related to Sections 2.4, 2.7, and 2.10.

### ***Review of Comments Filed by Stakeholders and Discussion***

Several parties filed comments on various sections of the report, specifically with respect to Sections 2.4 and 2.7. It became clear at the Committee hearing that any issues expressed in the staff workshop report regarding Section 2.10 were no longer contended.

### **Section 2.4 (Compliance with Laws, Rules, and Tariffs)**

The California Independent System Operator (ISO) argues in its comments that its name should be specifically recognized in the Rule language. It believes that adding a reference will “facilitate early dialogue and understanding between the ISO and *Electricity Producers* about applicable ISO requirements and how these can and should be incorporated into proposed facilities.” It calls for additional Section 2.4 language that makes compliance with “...applicable FERC-approved rules, tariffs, and standards of the ISO...” Most parties felt otherwise, arguing that no other entity is specifically noted in the language.

In our opinion, the ISO does not need to be specifically recognized in the proposed Rule language. Two reasons support this conclusion. First, the language requires compliance with any local, state, or federal law applicable to all aspects of the *Generating Facility* and

Interconnection Facilities. Compliance with rules imposed by the ISO clearly falls into that category. Second, no other entity except the CPUC is specifically referenced in the rule, which raises the question about the added value of having the ISO specifically mentioned. In rejecting the ISO claim, subsequent to discussions at the June 14<sup>th</sup> business meeting, we endorse adding language that essentially adds language to Section 2.4 referencing FERC-approved rules, tariffs, and regulations. Section 2.4 now reads as follows:

- 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.

### Section 2.7 (Confidentiality of Information)

Section 2.7 generated significant discussion both at the hearing and in written comments. As proposed in the staff workshop report, the proposed Rule explains that the "*Electrical Corporation* shall not use or disclose information provided by an Applicant to propose competing *Generating Facility* installations to the Applicant."

The California Manufacturers and Technology Association (CMTA), Honeywell, Enron, and others comment that an *Electrical Corporation* should be barred from using confidential information provided by an *Electricity Producer* for any other purpose than facilitating interconnection. Enron specifically notes that "*Electrical Corporations* should be prohibited from utilizing confidential information to develop customer offerings designed to compete with a planned DG installation." Coast Intelligen remains "troubled by the opportunity for utilities to utilize information gleaned from a proposed DG application against the DG proponent." New Energy suggests the following language addition for Section 2.7:

Any information pertaining to Generating and/or Interconnection Facilities provided to Electrical Corporation by an Electricity Producer shall be treated by Electrical Corporation in a confidential manner. Electrical Corporation shall not use or disclose information provided by an Applicant nor to propose discounted tariffs, the purpose of which is to prevent the installation of the Generating Facility. (New text proposed by New Energy is underlined).

The utilities believe that the rule language presented in the staff workshop report should remain unchanged. PG&E states that current controls are in place to prevent possible data abuses and it will treat all information as confidential in the manner it treats confidential customer data today. SDG&E also supports the current language but indicates it has no intention of owning DG on the customer side of the meter and therefore will not provide an opportunity to offer any proposals of its own. SCE also supports the staff workshop report language, further adding that parties are proposing "unreasonable and unworkable limitations" on *Electrical Corporations*. According to SCE: 1) there are many people and functions within the *Electrical Corporation* that must be aware of and evaluate the feasibility of potential generation installations, and 2) the spirit of consumer choice should keep the Electrical Corporation from being restricted from providing alternative CPUC-approved rate options. In addition, SCE notes it will be virtually impossible to police where the information was acquired.

With respect to Section 2.7, SCE's last point about not policing information acquisition is exactly the reason why tighter language is included in Rule 21. Utilities must not misuse confidential data contained in individual DG interconnection applications. While acknowledging the sincerity of the utilities to not inappropriately use confidential data from the applications, specific language must be added to guard against potential misuse. As the workshop report noted previously, the Energy Commission has previously urged positions like that endorsed by the non-utility stakeholders. We repeat previous Energy Commission positions taken in past CPUC proceedings: as long as the UDC is permitted to simultaneously engage in both regulated monopoly and competitive market activities, some market participants will be concerned that knowledge gained for legitimate purposes in furtherance of the distribution function will be used for anti-competitive purposes.

In response to the Committee's formal recommendation, PG&E noted in its June 9<sup>th</sup> comments that prohibiting *Electrical Corporations* from using information gained through the Distributed Generation application process to offer discounted tariffs to prevent the installation is "bad public policy and anti-consumer." The Energy Commission disagrees and continues to believe that *Electrical Corporations* must not misuse confidential data contained in individual interconnection applications. However, minor modifications were made to Section 2.7 to remove the text related to the intent of the discounted rate offering. In our opinion, rule language should not contain text that suggests intent. Rather, the language should simply state that discounted tariffs should not be offered based on that information. Revised Section 2.7 now reads as follows:

- 2.7 **Confidentiality of Information.** Any information pertaining to Generating and/or Interconnection Facilities provided to Electrical Corporation by an Electricity Producer shall be treated by Electrical Corporation in a confidential manner. Electrical Corporation shall not use or disclose information provided by an Applicant nor propose discounted tariffs based on that information.

## Other Elements of Section 2

We agree with staff's position to endorse all other portions of Section 2.

## **Section 3 – Application and Interconnection Process**

- 3.1 *Application Process*
  - 3.1.1 *Applicant Initiates Contact with the Electrical Corporation*
  - 3.1.2 *Applicant Completes an Application Document*
  - 3.1.3 *Electrical Corporation Performs an Initial Review and Develops Preliminary Cost Estimates and Interconnection Requirements*
  - 3.1.4 *When Required, Applicant and Electrical Corporation Commit to Additional Interconnection Study*
  - 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*
  - 3.1.6 *Electricity Producer Installs or Constructs the Generating Facility; Where Applicable, Electrical Corporation or Electricity Producer Installs Required Interconnection Facilities or Modifies Electric Corporation's Electric System*

- 3.1.7 *Electricity Producer Arranges for and Completes Testing of Generating Facility and, Where Applicable, Electricity Producer Installs Interconnection Facilities*
- 3.1.8 *Electrical Corporation Authorizes Interconnection*
- 3.1.9 *Electrical Corporation Reconciles Costs and Payments*

Section 3 details the steps necessary for a DG applicant to connect to an *Electrical Corporation*. The process begins with the DG applicant making an initial inquiry about connecting to the distribution system. The *Electrical Corporation* shall then provide the Applicant with a standardized application and associated technical documents within three business days. The Applicant then files a completed application with the *Electrical Corporation* along with a fee for processing the request and performing an initial review of the application.

The key to the application review is an *Initial Review Process* developed by the technical working group. Its primary purpose is to allow the *Electrical Corporation* to distinguish the review for applications that can quickly be approved from those that need a more significant commitment of resources from the *Electrical Corporation*. The review for applications is categorized into three groups: 1) a simplified review, 2) a supplemental review that may require minor system modifications, and 3) a major interconnection study with significant system changes.

To qualify for the simplified review, an Applicant's proposed DG interconnection must pass a series of basic interconnection questions and threshold parameters. The parameters applicable to the simplified review are considered very conservative by the technical group and are intended to be applicable regardless of where the DG interconnection is located on the distribution system. However, an application can still be screened on a simplified basis if the reviewer determines that the threshold parameters of the screens are exceeded without compromising the protective "intent" of those screens.

For an application not passing the initial screens, a more in-depth review is required to identify minor system modifications and identify items specifically required of the Applicant that will be needed before the interconnection is completed. For applications determined by the reviewer to require significant modification to the distribution system at the desired location, the Applicant and *Electrical Corporation* shall formally agree to the terms and conditions of an interconnection study prior to connection.

The Applicant can construct the interconnection facilities and commence operation upon compliance with the provisions of any required documentation, signing an interconnection agreement, paying all applicable fees, and satisfactorily completing any required inspections or tests.

### ***Staff Recommendation from the April 2000 Workshop Report***

Staff recommends endorsement of the *Initial Review Process* and the proposed Rule language that supports the concept. **The *Initial Review Process* is the key change to the Rule 21 language currently applicable to each of the three investor-owned utilities and is strongly supported in concept by the working groups.**

## ***Comments Filed by Stakeholders and Discussion***

### Timelines for Initial Review and Supplemental Review

As stated in the workshop report and repeated in the comments, PG&E, SCE, and SDG&E expressed a uniform concern about the firmness of the days required to complete various portions of the Initial Review and Supplemental Reviews. Section 3.1.3.2 of the proposed Rule language states that the “*Electrical Corporation* shall normally complete its Initial Review within 10 business days if the Application qualifies for Simplified Interconnection.” Section 3.1.3.3 states the “Supplemental Review will normally be completed within 20 business days after receiving a completed Application.”

PG&E indicates it may be “premature to enforce a timeline which may be impractical.” SDG&E agrees with PG&E, noting the need for the rules to recognize that circumstances may arise where it is impossible to meet the timing requirements. SCE endorses the use of a good-faith effort to “complete these studies in the shortest time possible.”

The Energy Commission recognizes that certain unforeseen situations can occur that could make it difficult for any of the utilities to maintain responding within an appropriate timeframe. We agree that the utilities should be given the discretion to miss a 10-day and 20-day deadline for completing an Initial Review and a Supplemental Review of a DG application when circumstances require it is not practical to do so. In the Energy Commission’s opinion, the proposed language provided in the staff workshop report should be modified as follows:

- 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.....
- 3.1.3.3 ...The Supplemental Review shall be completed, absent any extraordinary circumstances, within 20 business days of receipt of a completed Application.

### DG Interconnection Fees – Initial and Supplemental Reviews

The appropriate calculation of the interconnection study fee for DG applications destined for Section 3.1.2 is an important issue that did reach resolution in advance of the staff workshop report. As indicated by staff, working group members noted that present interconnection study costs are traditionally treated as a “black box” of information. In these situations, the utility is not required to detail the costs of specific tasks performed in the study; rather, the Applicant is simply provided a bill for the study with no explanation. In response to this claim, PG&E states that it would provide a cost breakout upon request. One goal of this section was to provide some certainty for study costs. Without some resolution, some parties suggested that the issue be considered in a supplemental recommendation provided by the Energy Commission to the CPUC after further debate during the summer.

To determine what progress could be made on the issue, the Committee asked staff to convene a meeting with key members of the technical and non-technical working groups. A teleconference call was held on May 4, 2000 with representatives from each of the three investor-owned utilities, two municipalities, two energy service providers, a manufacturer, and Energy Commission staff to discuss the issue. Several alternatives were shared and some general agreements were reached. First, parties agreed that there should be some minimum charge for the Initial Review process. However, no agreements were reached regarding what that minimum fee might be. Second, the charge for the Supplemental Review should be reasonable and not exceed a specific dollar amount ranging from \$1,500 to \$4,000. The range for the Supplemental Review varies depending on the assumed amount of engineering time utilized for the review. Parties did agree that the approximate engineering time should be billed at approximately \$100 per hour. In this case, the review time for the Supplemental Review ranges from 15 to 40 hours. Parties and staff suggested that the Committee could pick from this range and modify the text of Section 3.1.2 accordingly.

The Energy Commission appreciates the proposals put forth during the teleconference and the willingness to agree on a range for us to consider. Agreeing with the recommendations of the Committee in its report, we are unwilling to commit to any minimum or maximum fee without further development of the evidentiary record. We direct staff to develop a full record on this issue during the summer working group meetings.

### Notification to the ISO

The ISO comments state that it should be notified when an application is submitted and when an interconnection is completed. It argues that the information would be useful in the context of system planning. It could also be used so that the ISO “could contact *Electricity Producers* to explain ISO requirements in the event that an *Electricity Producer* fails to contact the ISO, and to alert the UDC at an early stage of the process if the ISO has any concerns related to the proposed project.” The following addition to Section 3 was offered by the ISO in its written comments:

- 3.2 Notification to the ISO.** The UDC will notify the ISO when it receives an application to interconnect and when it allows an interconnected generating facility to commence parallel operations.

As staff reported in the workshop report, many working group members questioned why the ISO needed information on all interconnection applications submitted, including those that do not result in an interconnection. The Cogeneration Association of California / Energy Producers Users Coalition (CAC/EPUC) commented that the ISO’s concerns are “premature until FERC or the CPUC approve the applicability of any ISO interconnection.”

We are not convinced by the ISO arguments that it be notified whenever an application to interconnect with a utility is submitted. We see little value in the ISO having knowledge of that information. However, the Energy Commission believes the ISO should be notified when interconnection applications are ultimately approved. This issue should be further debated during the summer working group meetings to define when and how that notice will occur, as well as determining whether there are instances when notification is not necessary. In

considering the last point, we suggest addressing a CMTA comment that “DG facilities providing generation consumed on-site and interconnected to distribution facilities retained by the utilities are not subject to control by the ISO.”

### Defining a Supplemental Review

Throughout the workshop process, stakeholders focused on developing the Initial Review process and left the details of the Supplemental Review for a future date. Appendix A of the proposed Rule language defines some of the supplemental review work but leaves issues in general terms. For example, in the details of the Initial Review process, each screen contains a significance comment. That comment is designed to help the reviewer focus work in some areas but does not suggest any specifics to that effect.

During the May 4, 2000 teleconference on interconnection study fees, parties suggested that the Supplemental Review be based on engineering time equal to \$100 per hour. This approach gives the reviewer the flexibility to determine where review efforts should be focused. We agree with this approach and endorse the use of engineering time to determine the Supplemental Review costs. We suggest this issue be explored further during supplemental work recommended to begin in July.

### Reconciling Estimated Study Costs for Small DG Projects

Section 3.1.9 of the proposed rule language focuses on a process whereby an *Electricity Producer* may opt to have an *Electrical Corporation* reconcile any advance payments it made to an *Electrical Corporation* based on the actual cost of completing the interconnection. Under the proposed rule language, an *Electricity Producer* can agree to either: 1) a fixed cost calculation with no reconciliation once the work is complete; or 2) actual cost billing, with a cost reconciliation performed by the utility.

In its comments, PG&E argues that the costs of conducting a cost reconciliation “can be a sizeable fraction of the study cost. Smaller units (under 1 MW) should pay an estimated cost without true-up.” As such, the utility requests further consideration of this issue by the Energy Commission. We offer no opinion regarding PG&E’s concern at this time but believe the issue should be further explored during the course of the supplemental working group meetings.

## **Section 4 – Generating Facility Design and Operating Requirements**

4.1 *General Interconnection and Protection Requirements*

4.2 *Prevention of Interference*

4.3 *Control, Protection, and Safety Equipment Requirements for Distributed Generators*

This section provides the technical (electrical engineering) underpinnings for the procedures and practices of interconnection recommended in Rule 21. The section identifies the basic electrical engineering issues affecting the safety and reliability of the distribution grid. In addition, it specifies performance requirements (rather than equipment) and operating conditions that must be met to safeguard the distribution grid against power quality and other disturbances that might

originate in a DG system. The specifications in the proposed Rule language are based on current utility practices and the National Electrical Code. The section also reflects general agreement on certification and testing protocols that would be acceptable to *Electrical Corporations* and ultimately expedite and simplify the interconnection process. The recommended certification and testing, to the extent possible, references the work in progress of the various Institute of Electrical and Electronic Engineers (IEEE) committees currently addressing interconnection issues on a national level. Some of the distribution technologies and the interconnection equipment are still evolving, and the testing protocols are still being developed. This section recognizes this limitation and recommends an interim solution that is generally acceptable to the concerned parties. It also addresses the technical aspects of the screening process that allow for expedited interconnection application review. The detailed steps involved in the screening process are presented in Appendix A of the proposed Rule language.

This section was developed by a technical subgroup of the interconnection working group and mostly consisted of electrical engineering professionals representing the utilities, vendors, system integrators and consultants working for the Energy Commission. As indicated earlier, several participants are presently serving on national IEEE committees formulating national interconnection standards and testing protocols. The extensive work done by this group through this workshop process far surpasses work on interconnection rules completed in other states; as a result, California standards that develop out of this investigation could affect the development of national interconnection standards.

### ***Staff Recommendation from the April 2000 Workshop Report***

If it is clear based on the results of the April 25<sup>th</sup> Committee hearing that parties generally favor the tone and content of Section 4, then staff recommends endorsing the language soon after reviewing written comments from stakeholders.

### ***Comments Filed by Stakeholders and Discussion***

Honeywell, Plug Power, PG&E, SCE, and New Energy filed technical comments regarding Section 4. Many of the comments relate to definitions not provided in the staff workshop report, such as Short Circuit Contribution Ratio, and text inadvertently omitted from Section 4.3, which were corrected in the Committee's recommendation and this report. Others were not considered since the issues were not addressed during the course of the working group activity.

SCE's comments suggest two specific areas of Section 4 where text is duplicative and should be removed: 1) Section 4.2.1, describing conformance to codes, rules, and laws which the utility believes is covered in Section 2.4; and 2) Section 4.2.2, describing facility design, covered in Section 2.5. In addition, SCE suggests deleting Section 2.9, revising Section 4.2.8 to read as follows:

- 4.2.8 These requirements are designed to protect the Electricity Producer'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."

The Energy Commission agrees with SCE's recommended language changes and will incorporate them in the proposed Rule language. We also agree with some of the word changes proposed by PG&E in its comments, as well as changes suggested by others. The changes, while not necessarily mentioned here, are included in the proposed Rule language shown in Attachment A of this report.

PG&E, in both its May and June written comments, expressed concern that Section 4 of the proposed rule language does not adequately address technical interconnection requirements for larger projects. The utility argues that the workshops focused almost exclusively on the interconnection of small, standardized units. After addressing this issue at the June 14<sup>th</sup> business meeting, we direct the working groups to address PG&E's concern during the supplemental working group activities this summer.

## **Section 5 – Interconnection Facility Ownership and Financing**

*5.1 Scope and Ownership of Interconnection Facilities*

*5.2 Responsibility for Costs of Interconnecting a Generating Facility*

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

This section deals with the cost allocation of DG interconnection. The policy issues for cost allocation of DG interconnection are part of the rate design discussions and testimony in Phase 2 of the CPUC's proceeding on distributed generation. Because of this fact and the timing of the proceedings versus this effort to revise Rule 21, **the language within this section reflects how the cost allocation is currently instituted and does not prejudge how the CPUC should determine this matter.** The section as written provides a method of cost allocation during the interim period between when the proposed Rule language is adopted and when the CPUC addresses cost allocation questions. Following a CPUC decision regarding cost allocation and rate design structure, Section 5 will need to be reviewed and revised for consistency, as necessary.

### ***Staff Recommendation from April 2000 Workshop Report***

The language contained in Section 5 of the proposed Rule should be fully endorsed. The issue of cost allocation is a rate design issue that is more appropriate to address in the Phase 2 testimony of the CPUC rulemaking.

### ***Comments Filed by Stakeholders and Discussion***

No significant comments were filed by stakeholders regarding Section 5. PG&E notes that the section “departs little from established practices under PG&E’s Rule 21. However, it is missing numerous provisions which are contained in PG&E’s existing Rule 21, particularly with respect to Special Facilities.” New Energy reaffirms staff’s position that the Section reflects cost allocation as it stands today and does not represent a recommendation about what the cost allocation should be.

With no major contention offered in this process, the Energy Commission supports staff’s recommendation to endorse the proposed language in Section 5. We also agree to add a definition for *Special Facilities*, based on language contained in PG&E’s existing Rule 21.

## **Section 6 – Metering, Monitoring, and Telemetry**

- 6.1 *General Requirements*
- 6.2 *Metering by Non-Electrical Corporation Parties*
- 6.3 *Net Generation Metering*
- 6.4 *Point of Common Coupling Metering*
- 6.5 *Telemetry*
- 6.6 *Sunset Provision*
- 6.7 *Location*
- 6.8 *Costs of Metering*

This section responds to the need for requiring advanced metering equipment in order to efficiently schedule and dispatch DG. It begins with the general requirement that all *Generating Facilities* shall comply with all applicable tariffs and *Electrical Corporation* manuals dealing with metering specifications. The section does not apply to *Generating Facilities* operating with net metering tariffs.

The proposed Rule language then identifies that meter ownership, installation, operation, reading, and testing shall be performed by the *Electrical Corporation* except when the CPUC authorized another entity to perform the task. The section also addresses meter location issues, such as placement of the meter, and proposes that the *Electricity Producer* and/or customers bear all of the costs required by Rule 21.

The remainder of the section deals with specific areas that were discussed extensively and bear further elaboration. The concept of *net generation metering* was addressed to ensure that the terminology used by the working groups was consistent. *Net generation metering* occurs at the point after auxiliary load (electrical load required to run the generator). The ISO characterizes the same term as *gross generation metering* while the net generation concept is used in the field.

As indicated in the staff workshop report, the major issue of disagreement during the discussion of Section 6 concerned whether net generation metering should be required for *Generating Facilities*. Net generation metering is currently required for most DG interconnections<sup>2</sup> per distribution company tariffs and metering guidelines published in current interconnection

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<sup>2</sup> With the exception of those qualified under Public Utilities Code Section 2827.

handbooks. Proponents of net metering suggested that the requirement is needed for: 1) qualifying cogeneration gas allocations, 2) standby service administration, and 3) power purchase agreement administration/monitoring. Metering at the *Point of Common Coupling* is also required to measure power flow out to the distribution system as well as power supplied by the distribution system into the DG Customer's facility.

The utilities and the ISO originally held the position that net generation metering is required. From a distribution system planning and operations framework, they believed that information on net generation output is required to ensure the safe and reliable operation of the distribution system. The other working group members did not universally accept the utility and ISO position. CAC/EPUC in particular specifically supported several broad policy guidelines to determine what metering should be required: 1) the *Electrical Corporation* should clearly articulate the reason or purpose for which it requires such data and the minimum amount of data required to accomplish this purpose; 2) the least expensive method should be selected unless the distributed generator in its sole discretion chooses otherwise; 3) where the *Electrical Corporation's* purpose may be accomplished by only metering a subset of distributed generators, the metering requirement should not apply to small *Generating Facilities*; and 4) any information gathered is the propriety information of the distributed generator and should only be released to a party other than the UDC with the express consent of the distributed generator.

### ***Staff Recommendation from April 2000 Workshop Report***

Staff recommends endorsing the rule language applicable to Sections 6.1, 6.2, 6.5, and 6.6 and having further debate on the issue of net generation metering and telemetry requirements.

### ***Comments Filed by Stakeholders and Discussion***

PG&E, CAC/EPUC, and the ISO have been the most vocal players in the net metering discussion in this workshop process. All parties confirmed at the April 25<sup>th</sup> Committee hearing that they had failed to reach an agreement on unresolved issues but pledged to bring forward an agreed-upon set of language the Committee could endorse on an interim basis for the purposes of putting new rules into effect. Due to scheduling conflicts, the ISO was unable to participate in the development of interim language.

In its comments, the ISO notes its willingness to evaluate “whether, and to what extent, exemptions from the requirement for Net Generation Metering are appropriate, balancing the cost of compliance in proportion to overall typical project costs against the need for accurate information to maintain system reliability and to fairly allocate costs.” It suggests that the language of the net generation metering Section 6.3 provided by PG&E could be used on an interim basis with the underlined word addition as follows:

**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, and as necessary to meet ISO metering requirements, the Electrical Corporation shall have the right to specify the type, and require the installation of, Net Generation Metering. Net Generation Metering shall be at the Electricity Producer's expense and shall have the ability to record the profile of the Generating Facility's kW or kWh output.

The ISO recommends a process facilitated by the Energy Commission during the August timeframe to bring forth a new proposal that would be subject to hearings in September. PG&E and CAC/EPUC's interim proposal is provided directly below:

**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, 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.

**6.3b. 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 détentes to prevent reverse registration.

**6.4a 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 Telemetering to the extent that less intrusive and/or more cost effective options for providing the necessary data in real time are not available.

- 6.5 Sunset Provision** Sections 6.3 and 6.4a 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.

In summary, the interim proposal calls for the utilities to file applications for permanent metering requirements for Generating Facilities by the end of 2002. It also removes the strict need for net generation metering and telemetering facilities except when it is determined by the Electrical Corporation that “less intrusive and/or more cost effective options” for providing the required data are not available.

Other parties filing comments on this section include CMTA. CMTA indicates that the ISO does not need to be aware of all loads and generation, arguing that FERC has already clearly defined a “bright line for transmission facilities subject to the control of the ISO.” Honeywell argues that metering should not be required on any facility that does not export power to the grid, considering it to be: 1) financially burdensome on the small non-export distributed generators and 2) to provide little value or information to the Electrical Corporation. New Energy suggests the following language for Section 6.4:

- 6.4a Telemetering** Telemetry at the Point of Common Coupling may be required when the Generating Facility: 1) will be exporting power onto the grid for the purpose of selling energy, capacity, or ancillary services, and 2) at the Point of Common Coupling significantly effects the operations of the distribution grid such that “real-time” information is needed to safely and reliably operate the distribution grid.

In general, we find merit with much of the interim language proposed by PG&E and CAC/EPUC. Regarding Section 6.4a, the requirement for small facilities to have telemetering equipment is much more flexible than in the previous rule language proposed by the working groups. Rather than requiring equipment for all *Generating Facilities* 100 kW or greater that are interconnected to a distribution system operating at a voltage below 10 kV or that are 500 kW or greater for all others, it now only “may be required on *Generating Facilities* 250 kW or greater” for the former and 1 MW for the latter.

The other attractive feature of the new language is a specific reference to a sunset provision, which calls for the *Electrical Corporation* to file permanent metering requirements with the CPUC by the end of 2002.

In spite of the positive direction the language appears to be moving towards, the Energy Commission remains concerned that the *Electrical Corporation* retains considerable discretion regarding whether net generation metering and telemetering equipment is required. We are willing to accept these provisions provided that there is a mechanism put in place to track how these provisions are being applied. As such, the Energy Commission recommends that the *Electrical Corporation* provide to the CPUC or the Energy Commission a report on a quarterly basis identifying each instance where net generation metering or telemetering requirements are determined by the Electrical Corporation to be necessary. The report should include the size and location of the facility, as well as the reason for requiring the net generation metering or

telemetering equipment. The rule language adopted in this report will indicate this change. The addition of this provision should mitigate the concerns expressed by parties in their comments.

With this provision put in place, we endorse the proposed language provided by PG&E and CAC/EPUC. We also add language tying applicability of Section 6.3 to the compliance language provided in Section 2.4. We also endorse the other sections of the rule language (6.1, 6.2, 6.5, and 6.6) as recommended by staff in its workshop report. The Sections 6.5 and 6.6 will be renumbered to reflect the new language proposed by PG&E and CAC/EPUC.

## **Section 7 – Dispute Resolution Process**

Rule 21 language contained in Section 7 refers to the process required to resolve interconnection issues under dispute. Under the proposal, disputing parties have 45 calendar days to meet and confer to try to resolve a dispute. If the dispute is not resolved during that period, the CPUC would address the issue using current dispute guidelines pursuant to Article 3 (Rules 9-14) of the CPUC Rules of Practice and Procedure. Pending resolution of any disputes, the proposed language calls for the *Electrical Corporation* and the *Electricity Producer* to continue with the performance of their respective obligations under the interconnection agreement.

### ***Staff Recommendation from the April 2000 Workshop Report***

Staff believes that additional work is needed to further refine the dispute language. While the concerns noted by parties are quite valid and deserving of consideration, staff believes that the proposed language is appropriate for the Committee to endorse. Recognition should be given that additional work should be done in this subject area after interim Rule language is adopted by the CPUC.

### ***Comments Filed by Stakeholders and Discussion***

Comments on Section 7 were filed by PG&E, Honeywell, and New Energy. Each party maintains that the proposed language could be adopted on an interim basis and then further refining at a later date. PG&E adds that the section represents a “fair compromise” of the working group process. Honeywell appears to agree although notes its desire to shorten the time period for resolving disputes. To provide a complete record, we repeat from the staff report the concerns of some parties that believe the dispute process is invariably skewed in favor of the utility. If, for example, the utility seeks to extend the arbitration process for a significant length of time, a non-utility disputing party might not have the resources left to continue the resolution process. In that case, the utility wins the dispute by default.

We recognize the concerns expressed during the working group process regarding the inability of parties to have the available resources to arbitrate a particular dispute. However, no parties submitted these comments during the formal comment period. We agree with the parties filing comments that the proposed language in Section 7 is acceptable along with a commitment to

further investigate how to refine the dispute resolution process. The Energy Commission stands ready to further investigate this issue during the supplemental report period.

## **Section 8 – Definitions**

The final section of the proposed Rule language is designed to ensure consistency across all sections of the proposed Rule language. A definitions subgroup was empowered to develop specific definitions covering a wide range of technical and non-technical terms. More than 50 definitions were developed and are provided in Section 8 of the proposed Rule. Both working groups offered general agreement on the list of definitions.

### ***Staff Recommendation from the April 2000 Workshop Report***

Staff recommends endorsement of the definition language contained in Section 8.

### ***Comments Filed by Stakeholders and Discussion***

Parties generally agree with the breadth of definitions applied in the proposed Rule language. Still, there are several areas identified by stakeholders that require clarification or additional work. PG&E indicates missing definitions for the following terms: 1) Short Circuit Contribution Ratio (SCCR) (Section 4.4.2.1), 2) Interconnection Facilities (Section 5.1.1), and 3) Special Facilities (Section 5), with specific reference to rule language in the existing PG&E Rule 21 that could apply. They also indicate that definitions for Load Balance Ratio and Net Nameplate Rating are not needed since they are not used. SDG&E provides some clarification to the Net Nameplate Rating definition.

We endorse the definitions contained in Section 8 as suggested by staff, with additions for SCCR and minor edits as needed.

## **II. ISSUES TO INCLUDE IN SUPPLEMENTAL REPORT**

As the Committee report suggested, there are several areas where additional work is needed to complete the development of standardized interconnection rules. As stated in the discussion of Section 3, the parties will need to meet during the summer months to develop a record that will allow the Energy Commission to recommend an appropriate minimum initial review fee and maximum supplemental review cost.

This part of the report highlights other issues needing additional investigation, namely: 1) uniqueness of utility tariffs, 2) completion by the working groups of a proposed set of standardized interconnection agreements and applications; 3) completion of procedures for type testing or precertifying generation equipment that will ultimately accelerate the application review process outlined in Section 3; and 4) specific language surrounding staff's need for an interconnection database. This part of the report concludes with a discussion about addressing future changes and reaching out to the municipalities and irrigation districts.

The resolution or further development of each of these issues will be the subject of a supplemental report that will be filed with the CPUC in the latter part of this summer.

### **Uniqueness of Utility Tariffs**

In its comments, SDG&E proposed that it be allowed to keep utility-specific provisions of Rule 21 intact, rather than being required to move them to other areas of the utility tariff rules. This echoes the comments of staff in its presentation at the hearing that SDG&E believes that some aspects of each utility's tariffs are unique and should be retained.

With this concept in mind, PG&E submitted an addendum to its comments that included strikeout text of its current Rule 21, incorporating many of the issues being considered in this workshop process. Without formally endorsing PG&E's proposal, the Energy Commission believes this approach should be used to determine what specific areas of each utility's tariffs are unique and should be retained. As part of the supplemental workshop process, we would like further working group meetings to address this issue in a manner that best suits the group.

### **Standard Application and Interconnection Agreements**

As stated in the workshop report, a major effort to draft standard application and interconnection agreements began near the conclusion of the formal workshop process. Meetings were held by interested members of the working group to develop a proposal for the Committee to consider at the April 25<sup>th</sup> Committee hearing. The discussion at the hearing suggested that no agreements had been reached about the provisions of the draft Standard Agreement related to liability and insurance coverage. Other issues include the following: 1) a party who consumes energy during a period when it has been forced to curtail or interrupt its generation, and 2) a party's right to schedule or control the maintenance outages taken by the other party. The stakeholders must further discuss these issues before a satisfactory resolution is reached.

The Committee in its report suggested that additional work will be needed before a formal set of applications and interconnection agreements can be offered for consideration by the CPUC. We agree. The Energy Commission recommends that additional working group meetings be held during July and August to address the issue in the supplemental workshop report to be issued later this summer.

### **Type Testing and Precertified Equipment**

As stated at the April 25<sup>th</sup> hearing, type testing and precertification work was set aside by the technical working group in lieu of completing the main text of the technical rules for interconnecting, now part of Section 4. Still, much progress was made on this area of the work but is not complete. The Energy Commission does not believe the lack of a complete product in this area is critical to the value of the proposed screening process at this point. The proposed Rule language is designed so that, in the event that no type testing and precertification options are available, the application can still be processed. We recommend that this work continue during the supplemental workshop process this summer with a report on progress and potential recommended rule language as part of the supplemental workshop report.

### **Monitoring the Development of Distributed Generation**

Staff recommended in its report that Section 6 specifically note that each *Electrical Corporation* develop and forward to the Energy Commission an “interconnection database.” It noted that the database would serve two purposes: 1) successive annual editions of this database would enable analysis of generation technology installation trends required of the Energy Commission by Public Utilities Code Section 383 and other statutory directives concerning renewable generation technologies; and 2) this database provides a source of generator ownership and contact information that can be used to ensure that all generators are complying with Energy Commission data reporting requirements.

In both comments and testimony at the April 25<sup>th</sup> hearing, none of the utilities objected with staff’s request. It was suggested that each utility would be willing to provide non-operational data for each interconnection, including the name, location, and nameplate capacity of the interconnected facility.

The Energy Commission agrees with staff’s recommendation and wishes to add the primary fuel type and technology type as categories to the database. As part of this proceeding, we recommend that the working groups develop appropriate language during the supplemental report process.

### **Forum for Addressing Future Changes Once the Proposed Rule is Adopted**

Staff recommended that the Energy Commission open another proceeding to facilitate the meetings of the technical and non-technical working group once the rules are ultimately adopted by the CPUC. These working groups would meet on a regular basis to address issues and proposed changes to Rule 21 in the future.

The Energy Commission believes that staff's recommendation for a working group process similar to the Rule 22 Direct Access working group process is a prudent and effective way to proceed. Therefore, once the CPUC issues a decision adopting Rule 21 tariff language, the Energy Commission will open a new proceeding as a home for addressing issues and recommending change. The specifics of that proceeding will be detailed at a subsequent hearing convened by the Committee, after consultation with the CPUC.

### **Extending CPUC Rules to Municipalities and Irrigation Districts**

Representatives from several publicly-owned utilities have actively participated in the interconnection working group meetings from the outset of the workshop process. Many have suggested the possibility that rules adopted by the CPUC could be tailored to apply to their respective municipality or irrigation district. Recognizing the value of this process to entities outside the jurisdiction of the CPUC, the California Municipal Utilities Association (CMUA) has indicated a willingness to assist the Energy Commission in disseminating the recommended interconnection rules to the various publicly-owned utilities. The recommended interconnection rules could be presented for review and eventual consideration by the respective local regulatory bodies.

The Energy Commission sincerely appreciates the participation of CMUA, the municipal districts, and the irrigation districts in this proceeding. A goal of this proceeding is to have consistent rules about interconnection in place statewide, to the extent possible. CMUA's agreement to assist the Energy Commission with this objective is paramount to making this become a reality, as it will be able to facilitate the information exchange between the Energy Commission and the publicly-owned utilities in the state.

The Energy Commission will meet with CMUA and any other publicly-owned utility and/or irrigation district to develop a plan for gaining support for the proposed Rule language beyond the scope of the utilities under CPUC jurisdiction. We will report on progress in the supplemental report.

### III. SUMMARY OF ENERGY COMMISSION RECOMMENDATIONS

#### Section 1

The Energy Commission endorses the language contained in Section 1.

#### Section 2

- 1) The ISO does not need to be specifically recognized in the proposed Rule language. However, we endorse adding language that references FERC-approved rules, tariffs, and regulations. Section 2.4 now reads as follows:

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) The Energy Commission recommends applying the following language to Section 2.7 of the rule language:

Any information pertaining to Generating and/or Interconnection Facilities provided to Electrical Corporation by an Electricity Producer shall be treated by Electrical Corporation in a confidential manner. Electrical Corporation shall not use or disclose information provided by an Applicant nor propose discounted tariffs based on that information.

- 3) We endorse all other portions of Section 2.

#### Section 3

- 1) The Energy Commission recognizes that certain unforeseen situations can occur that could make it difficult for any of the utilities to maintain responding within an appropriate timeframe. We agree that the utilities should be given the discretion to miss a 10-day and 20-day deadline for completing an Initial Review and a Supplemental Review of a DG application when circumstances require it is not practical to do so. In our opinion, the proposed language provided in the staff workshop report should be modified as follows:

3.1.3.2 The Electrical Corporation shall complete its Initial Review, absent any extraordinary circumstances, within 10 days if the Application qualifies for Simplified Interconnection.....

3.1.3.3 ...The Supplemental Review shall be completed, absent any extraordinary circumstances, within 20 business days of receipt of a completed Application.

- 2) We are unwilling to commit to any minimum or maximum fee without further development of the evidentiary record. We direct staff to develop a full record on the issue during the summer working group meetings.
- 3) We are not convinced by the ISO arguments that it be notified whenever an application to interconnect with a utility is submitted. We see little value in the ISO having knowledge of that information. However, the Energy Commission believes the ISO should be notified when interconnection applications are ultimately approved. This issue should be further debated during the summer working group meetings to define when and how that notice will occur, as well as determining whether there are instances when notification is not necessary. In considering the last point, we suggest addressing a CMTA comment that “DG facilities providing generation consumed on-site and interconnected to distribution facilities retained by the utilities are not subject to control by the ISO.”
- 4) We endorse the use of engineering time to determine the Supplemental Review costs. We suggest this issue be explored further during supplemental work recommended to begin in July.

#### Section 4

The Energy Commission agrees with SCE’s recommended language changes and will incorporate them in the proposed Rule language submitted for Energy Commission approval. It also agrees with some of the word changes proposed by PG&E in its comments, as well as changes suggested by others. The changes, while not necessarily mentioned here, are shown in strikeout mode in the proposed Rule language shown in Appendix A of this report.

We also direct the working groups to address a PG&E concern that Section 4 of the proposed rules does not adequately address technical interconnection requirements for larger projects.

#### Section 5

With no major contention offered in this process, the Energy Commission endorses the proposed language contained in Section 5.

#### Section 6

With a provision for auditing instances where utilities conclude that net generation metering or telemetering is required for a particular applicant, we endorse the proposed language provided by PG&E and CAC/EPUC. We also add language tying applicability of Section 6.3 to the compliance language provided in Section 2.4. We also endorse the other sections of the rule language (6.1, 6.2, 6.5, and 6.6) as recommended by staff in its workshop report. The Sections 6.5 and 6.6 will be renumbered to reflect the new language proposed by PG&E and CAC/EPUC.

#### Section 7

We agree with the parties filing comments that the proposed language in Section 7 is acceptable along with a commitment to further investigate how to refine the dispute resolution process. The Energy Commission stands ready to further investigate this issue during the supplemental report period.

### Section 8

We endorse the definitions contained in Section 8 as suggested by staff, with minor edits as suggested by many parties in this process.

### Areas Needing Supplemental Work

Additional working group meetings should be held during the summer on the following topic areas, each of which will be documented in a supplemental report to the CPUC in the latter part of this summer:

- Developing a record that will allow the Energy Commission to recommend an appropriate minimum initial review fee and maximum supplemental review cost.
- Uniqueness of utility tariffs,
- Standardized interconnection agreements and applications;
- Completion procedures for type testing or precertifying generation equipment
- Specific language surrounding staff's need for an interconnection database.

### Forum for Future Work

The Energy Commission recommends a working group process similar to the Rule 22 Direct Access working group to review future changes to the rule. We are willing to lead that process under the direction of the Committee. Once the CPUC issues a decision adopting Rule 21 tariff language, the Energy Commission will open a new proceeding as a home for addressing issues and recommending change. The specifics of that proceeding will be detailed at a subsequent hearing convened by the Committee, after consultation with the CPUC.

### Outreach to Entities Not Subject to CPUC Jurisdiction

The Energy Commission will work with CMUA to encourage municipalities and irrigation districts to adopt Rule 21-type rules that could further encourage standardized interconnection rules across the entire state.

#### **IV. NEXT STEPS**

The next step in this proceeding is for the CPUC to receive this recommendation and provide parties with an additional 21 days to submit written materials commenting on the Energy Commission process and factual misrepresentations. Subsequent to a review of this report, additional comments filed by parties, and the continuing progress of the supplemental work efforts, CPUC Administrative Law Judge Cooke will prepare a proposed decision for CPUC consideration. The timing associated with the CPUC's proposed decision on interconnection rules is scheduled for November, in conjunction with a proposed decision on other R.99-10-025 Phase 1 issues. It is possible, however, that the interconnection issue could be addressed earlier than November in a proposed decision that is separate from the other Phase 1 issues.

## ATTACHMENT A – Proposed Rule 21 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 or disclose information provided by an Applicant, nor propose discounted tariffs based on that information.
- 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 **Curtailement 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 (per P.U. Code Sec. 2827) | None                       |
| < 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:

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

*\*"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 4.3.4.1 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 Telemetering 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 telemetering 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:**

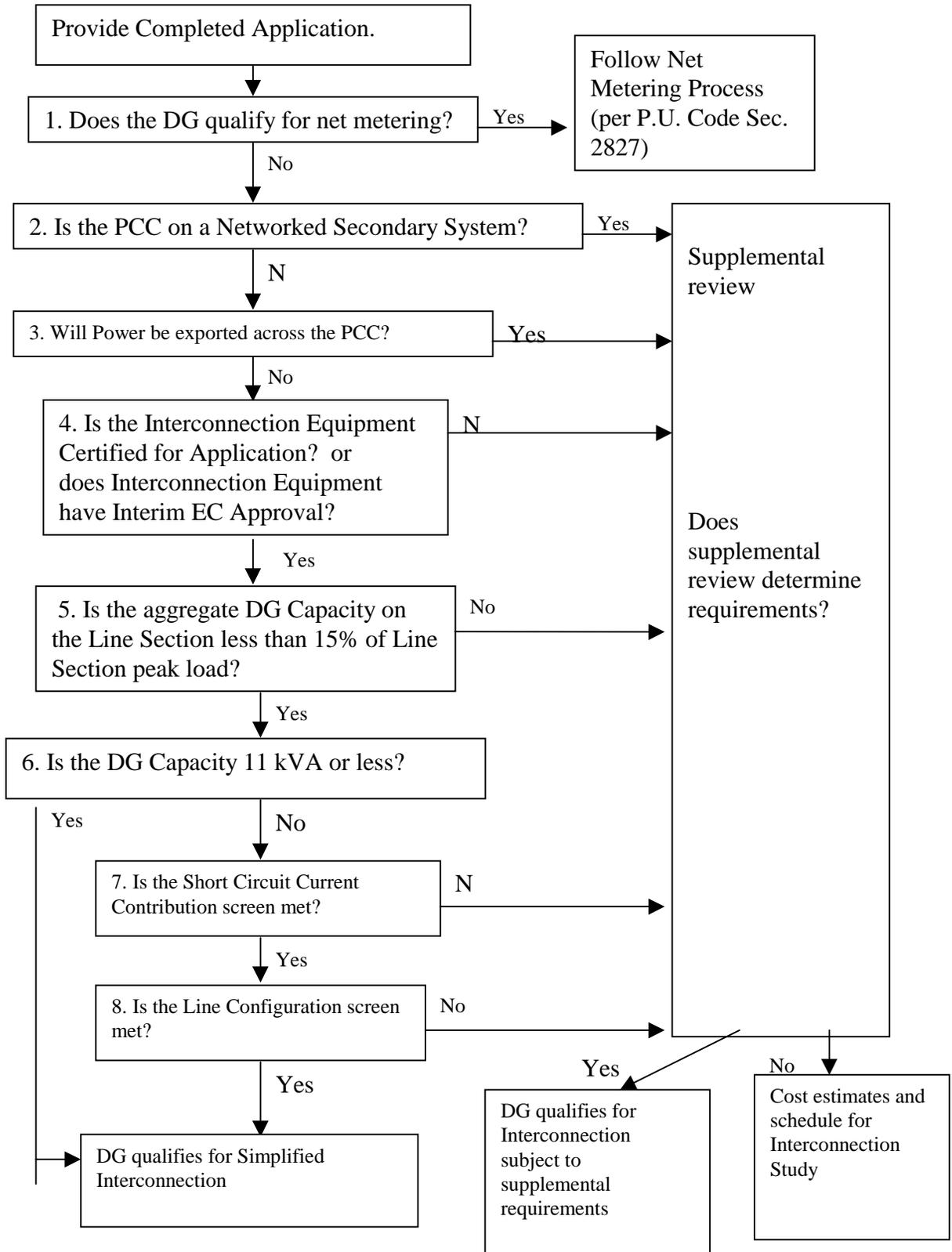
The Initial Review determines:

- 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**



## 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 qualifies for Simplified Interconnection.

### 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<br>(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.