ATTACHMENT B

GENERATING FACILITY INTERCONNECTIONS

RULE AND REGULATION 27

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A. APPLICABILITY

This Rule describes the Interconnection, Metering and operating requirements for Generating Facilities to be connected to the City of Palo Alto Utilities (CPAU) Electric Distribution System.

In order to provide for uniformity and to encourage the Interconnection of renewable energy generation, this Rule is intended to be generally consistent with the technical requirements of California Public Utilities Commission Rule 21 and IEEE 1547, as amended.

Language from IEEE 1547 that has been adopted directly (as opposed to paraphrased) is followed by a citation that lists the clause from which the language derived. For example, IEEE 1547-4.1.1 is a reference to Clause 4.1.1.

In the event of any conflict between this Rule and any of the CPUC Rule 21 and IEEE 1547 standards listed herein, the requirements of this Rule shall take precedence.

B. GENERAL RULES, RIGHTS AND OBLIGATIONS

1. Prior Authorization Required to Interconnect and Operate. An executed Interconnection Agreement or Net Energy Metering and Interconnection Agreement, as applicable, is required in addition to receiving CPAU's express written permission before Parallel Operation of a Generating Facility with CPAU's Distribution System. CPAU shall apply this Rule in a non-discriminatory manner and shall not unreasonably withhold its permission for Parallel Operation of Generating Facilities with CPAU's Distribution System.

2. Separate Agreements Required for Other Services. Separate Agreements are required for the provision of other Electric Services from CPAU including, but not limited to, Distribution Service provided by CPAU during periods of Curtailment or interruption of a Generating Facility, in accordance with CPAU's Rules & Regulations.

3. Service Not Provided With Interconnection. Interconnection with CPAU's Distribution System under this Rule provides no rights to utilize CPAU's Distribution System for the transmission, distribution, or wheeling of electric power.

4. Compliance with Laws, Rules & Regulations and Utility Rates. Applicants shall ascertain and comply with applicable CPAU Rules & Regulations and Utility Rates; applicable Federal Energy Regulatory Commission (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 Applicant's Generating Facility and Interconnection Facilities.

5. Design Reviews and Inspections. CPAU has the right to review the design of an Applicant's Generating Facility and Interconnection Facilities and to inspect the Generating Facility and/or Interconnection Facilities prior to the commencement of Parallel Operation with CPAU's Distribution System. CPAU may require Applicants to make modifications as necessary to comply with the requirements of CPAU Rules and Regulations or other reasonable requirements. CPAU's review and authorization for Parallel Operation shall not be construed as confirming or endorsing the Applicant's design or as warranting the Generating Facility and/or Interconnection Facilities' safety, durability or reliability. CPAU is not responsible for the adequacy or capacity of such Facilities.

6. Right to Access. Customer Generating and Interconnection Facilities shall be accessible to CPAU personnel whenever necessary for CPAU to perform its duties and exercise its rights under its Rules and Regulations and any Interconnection Agreement, including the Net Energy Metering and Interconnection Agreement.

7. Prudent Operation and Maintenance Required. The Customer shall operate and maintain its Generating Facility and Interconnection Facilities in accordance with Prudent Electrical Practices and shall maintain compliance with CPAU Rules and Regulations.

8. Curtailment and Disconnection. CPAU may limit the operation, disconnect or require the disconnection of a Customer's Generating Facility from CPAU's Distribution System at any time, with or without notice, in the event of an Emergency, or to correct Unsafe Operating Conditions. CPAU may also limit the operation, disconnect or require the disconnection of a Customer's Generating Facility from CPAU's Distribution System with reasonable written notice: (1) to allow for routine maintenance, repairs or modifications to CPAU's Distribution System; (2) upon CPAU's determination that a Customer's Generating Facility is not in compliance with any CPAU Rules and Regulations; or (3) upon termination of the applicable Interconnection Agreement or Net Energy Metering and Interconnection Agreement. Within a reasonable period after the Customer's written request, CPAU will provide a written explanation of the reason for such Curtailment or disconnection.

9. Coordination with Affected Systems. CPAU will notify the Affected System Operators that are potentially affected by an Applicant's Interconnection Request(s). CPAU will coordinate the conduct of any studies required to determine the impact of the Interconnection Request on Affected Systems with Affected System Operators and, if possible, include those results in its Interconnection Study. CPAU will invite such Affected System Operators to all meetings held with Applicant as required by this Rule. Applicants and transmission providers which may be an Affected System shall cooperate with CPAU in all matters related to the conduct of relevant studies and the determination of modifications to Affected Systems. Applicant shall enter into an agreement with the owner of the Affected System, as applicable and upon request by CPAU. The agreement will specify the terms governing payments to be made by Applicant to the owner of the Affected System as well as the repayment, if applicable, by the owner of the Affected System.

10. Transferability of Interconnection Request. An Applicant may transfer its Interconnection Request to another entity only if such entity acquires the proposed Generating Facility identified in the Interconnection Request and the Point of Interconnection and operating parameters do not change. CPAU at its discretion may deny such requests if CPAU determines applicable requirements will not be met as a result of the transfer.

11. Special Provisions Applicable to Net Energy Metering Applicants (NEM). Notwithstanding any other provision in this Rule:

a. For Generating Facilities qualifying for service under PUC Sections 2827, 2827.8 and 2827.10, as amended, the Applicant is not responsible for payment of study costs.

b. For Generating Facilities qualifying for service under PUC Sections 2827 and 2827.8, as amended, CPAU's approval for Interconnection will normally be processed not later than thirty (30) Business Days following CPAU's receipt of:

i. a completed Net Energy Metering Interconnection Request including all supporting documents and required payments;
ii. a completed signed Net Energy Metering Generator Interconnection Agreement; and
iii. evidence of Applicant's final electric inspection clearance from the Palo Alto Building Department.

If the 30-day period cannot be met, CPAU will notify Applicant of the reason for the inability to process the Interconnection Request and the expected completion date.

Applicants with PUC Section 2827 Generating Facilities that include non-inverter based Generators and/or Generators with non-Certified Equipment should submit a completed Net Energy Metering Interconnection Request, including all supporting documents sufficient for CPAU to start the review process, without waiting for the final inspection clearance. Applicants with such Generating Facilities are advised to submit their Interconnection Request at least six (6) months in advance of their planned Commercial Operation Date. Depending on the size and location of these Generating Facilities, additional time for review and study may be required.

C. APPLICATION AND INTERCONNECTION PROCESS

1. APPLICATION PROCESS

a. Utility Service Application (Application). All Applicants must complete and submit the Application and three (3) sets of plan drawings at the Development Center located at 285 Hamilton Avenue.

2. OVERVIEW OF THE INTERCONNECTION REVIEW PROCESS

a. Valid Interconnection Request. After an Application is received and deemed complete and valid, CPAU will start the interconnection review process. See Section B.11 for special provisions related to the timeframe and costs applicable to NEM Applicants.

b. Initial Review. Upon receipt of a complete and valid Application and plans, CPAU shall perform an Initial Review. The Initial Review determines if (i) the Generating Facility qualifies for a Simplified Interconnection, or (ii) the Generating Facility requires a Supplemental Review. Absent extraordinary circumstances, CPAU shall notify Applicant in writing of the results of Initial Review within ten (10) Business Days following validation of an Interconnection Request.

i. Passage of Initial Review. For Interconnection Requests that pass the Initial

Review and do not require Interconnection Facilities or Distribution Upgrades, CPAU will provide the Applicant with a Generator Interconnection Agreement or Generator Interconnection Agreement and Net Energy Metering Agreement, if applicable, within fifteen (15) Business Days of providing notice of Initial Review results. For Interconnection Requests that pass the Initial Review but also require Interconnection Facilities or Distribution upgrades, CPAU will provide Applicant with a non-binding cost estimate of the Interconnection Facilities or Distribution upgrades within thirty (30) Business Days of providing notice of Initial Review results. These facilities may be treated as Special Facilities (depending on circumstance) for the purpose of determining Applicant costs. The applicant can then proceed with executing an Interconnection Agreement in accordance with Section C.1.e below.

ii. Failure of Initial Review. For Interconnection Requests that fail Initial Review, CPAU will provide the technical reason, data and analysis supporting the Initial Review results in writing and provide Applicant the option to proceed directly to a Supplemental Review. The Applicant shall notify CPAU within ten (10) Business Days following such notification whether to (i) proceed to a Supplemental Review, or (ii) withdraw the Interconnection Request. Applicants that elect to proceed to a Supplemental Review shall provide a nonrefundable Advance Engineering Fee set forth in Rate Schedule E-15 with their response. CPAU will proceed with the Supplemental Review once payment of the required Advance Engineering Fee has been received. If Applicant fails to notify CPAU within ten (10) Business Days of such notification, the Interconnection Request will be deemed withdrawn.

iii. Additional Initial Review Information. No changes may be made to the planned Point of Interconnection or Generating Facility size included in the Interconnection Request during the review process, unless such changes are agreed to by CPAU. Where agreement has not been reached, Applicants choosing to change the Point of Interconnection or Generating Facility size must reapply and submit a new Interconnection Request.

c. Supplemental Review.

If Applicant requests a Supplemental Review and submits an Advance Engineering Fee as described in Rate Schedule E-15, if required, CPAU will perform the Supplemental Review using the review process in Section H.2., and complete the Supplemental Review within twenty (20) Business Days, absent extraordinary circumstances, following authorization and receipt of the fee. The Supplemental Review will determine if (i) the Generating Facility qualifies for interconnection, or interconnection with additional requirements, or (ii) the Generating Facility requires a Detailed Study.

The Applicant must provide the following data to CPAU when requesting a Supplemental Review:

Generator:

1. MVA Rating
2. kV Rating
3. Base MVA
4. Base kV
5. Xd" (direct axis subtransient reactance)
6. Xd' (direct axis transient reactance)
7. Xd (Synchronous reactance)
8. X2 (Negative Sequence reactance)
9. X0 (Zero Sequence reactance)

Generating Facility Transformer Data:

1. Winding configuration (delta-Wye gnd or Wye gnd-Delta)
2. MVA Rating
3. KV Rating
4. Base MVA
5. Base KV
6. Z1 HV-LV
7. Z0 HV-LV

Line Data:

1. Impedance data for line from Transformer to POI (if applicable)
2. Z1
3. Z0
4. Point of Interconnection (POI) Location

i. Passage of Supplemental Review. For Interconnection Requests that pass a Supplemental Review and do not require Interconnection Facilities or Distribution Upgrades, CPAU will provide Applicant with a Generator Interconnection Agreement within fifteen (15) Business Days of providing notice of the Supplemental Review results. For Interconnection Requests that pass a Supplemental Review but also require Interconnection Facilities or Distribution upgrades, CPAU will provide Applicant with a non-binding cost estimate of the Interconnection Facilities or Distribution upgrades within thirty (30) Business Days of providing notice of the Supplemental Review results. These facilities may be treated as Special Facilities (depending on circumstance) for the purpose of determining Applicant costs. The Applicant can then proceed with executing an Interconnection Agreement in accordance with Section C.1.e below.

ii. Failure of Supplemental Review. For Interconnection Requests that fail a Supplemental Review, CPAU will provide the technical reason, data and analysis supporting the Supplemental Review results in writing and provide Applicant the option to proceed directly to a cost estimate and schedule for a Detailed Study. The Applicant shall notify CPAU within fifteen (15) Business Days following such notification whether to (i) proceed to a cost estimate and schedule for a Detailed Study, or (ii) withdraw the Interconnection Request. If the Applicant elects to proceed with the cost estimate and schedule for a Detailed Study, CPAU shall provide Applicant with a non-binding cost estimate and schedule within thirty (30) Business Days of the Applicant providing notice to proceed. If Applicant fails to notify CPAU within fifteen (15) Business Days of such notification, the Interconnection Request shall be deemed withdrawn.

d. Detailed Study.

If the Applicant requests to proceed with the cost estimate and schedule for a Detailed Study as provided by CPAU in Section C.1.c.ii above, CPAU and the Applicant may enter into a Detailed Study agreement that provides for CPAU to perform additional studies, facility design and engineering, and to provide an estimate for the actual cost of CPAU provided Interconnection Facilities or Distribution Upgrades as required to allow for the interconnection of the generating facility at the Applicant's expense. The Detailed Study agreement shall set forth CPAU's estimated time schedule and charges for completing such work. Note: the Detailed Study fee shall be waived for NEM applicants meeting the requirements of Section B.11. Following payment of the cost estimate by the Applicant, CPAU will proceed with the Detail Study in accordance with the agreed upon time schedule, and upon completion of the Detailed Study, CPAU will provide the results in writing to the Applicant along with the final cost estimate of any required Interconnection or Distribution Facilities. These facilities may be treated as Special Facilities (depending on circumstance) for the purpose of determining Applicant costs. The applicant can then proceed with executing an Interconnection Agreement in accordance with Section C.1.e below.

e. Execution of the Generator Interconnection Agreement.

i. Following the receipt of a cost estimate for any Distribution Upgrades and/or Interconnection Facilities that have been identified (Applicants that did not require a cost estimate may proceed to Section C.1.e.ii below), Applicant shall notify CPAU within fifteen (15) Business Days whether Applicant: (i) requests a Generator Interconnection Agreement, or (ii) withdraws its Interconnection Request. If Applicant fails to notify CPAU within fifteen (15) Business Days, the Interconnection Request shall be deemed withdrawn. If Applicant elects to proceed to a Generator Interconnection Agreement, CPAU will provide Applicant with a Generator Interconnection Agreement for Applicant's signature within fifteen (15) Business Days of Applicant's request.

ii. Upon receipt of a draft Generator Interconnection Agreement, Applicant has ninety (90) Calendar Days to sign and return the Generator

Interconnection Agreement. Applicant shall provide to CPAU written comments, or notification of a lack of any comments, on the draft Generator Interconnection Agreement and appendices within thirty (30) Calendar Days. At the request of Applicant, CPAU shall begin negotiations with Applicant at any time after CPAU provides Applicant with the draft Generator Interconnection Agreement, which contains in its appendices the cost estimate for any Distribution Upgrades and/or Interconnection Facilities that have been identified by CPAU. If Applicant fails to execute the Generator Interconnection Agreement within the ninety (90) Calendar Days described in this section, the Interconnection Request shall be deemed withdrawn.

iii. After Applicant has executed the Generator Interconnection Agreement and paid the final invoice for estimated cost of Distribution Upgrades and/or Interconnection Facilities, CPAU will commence with the design, procurement, construction and installation of required facilities identified in the Generator Interconnection Agreement. (Note: once the Applicant executes the agreement, the Applicant is thereafter referred to as a Producer) CPAU and Producer will use good faith efforts to meet schedules and estimated costs in accordance with the requirements of the Generator Interconnection Agreement. Producer is responsible for all costs associated with Parallel Operation to support the safe and reliable operation of the Distribution System and Transmission System.

3. COMMISSIONING TESTING AND PARALLEL OPERATION

a. Commissioning Testing. Producer is responsible for commissioning and testing new Generating Facilities and associated Interconnection Facilities to ensure compliance with the safety and reliability provisions of this Rule prior to being operated in parallel with CPAU's Distribution or Transmission System. For non-Certified Equipment, Producer shall develop a written testing plan to be submitted to CPAU for its review and acceptance. Where applicable, the testing plan shall include the installation test procedures published by the manufacturer of the Generating Facility or Interconnection Facilities. Facility testing shall be conducted at a mutually agreeable time, and CPAU shall be given the opportunity to witness the tests.

b. Parallel Operation or Momentary Parallel Operation. Producer shall not commence Parallel Operation of its Generating Facility with CPAU's system unless it has received CPAU's express written permission to do so. CPAU will authorize Producer's Generating Facility for Parallel Operation or momentary Parallel Operation with CPAU's Distribution or Transmission System, in writing, within five (5) Calendar Days of satisfactory compliance with the terms of all applicable agreements.

4. WITHDRAWAL / CANCELLATION

Applicant may withdraw its Interconnection Request at any time by written notice of such withdrawal to CPAU. In addition, after receipt of the Interconnection Request, if Applicant fails to adhere to the requirements and timelines of this rule, CPAU shall deem the Interconnection Request to be withdrawn and shall provide written notice to Applicant of the deemed withdrawal within five (5) Business Days and an explanation of the reasons for such deemed withdrawal. Upon receipt of such written notice, Applicant shall have five (5) Business Days in which to either respond with information or action that either cures the deficiency or supports its position that the deemed withdrawal was erroneous.

Applications that are over one year old (from the date of CPAU's receipt) without resulting in a signed Interconnection Agreement or Net Energy Metering and Interconnection Agreement, or approval for Parallel Operation of a Generating Facility within one year of completion of all applicable review and/or studies, are subject to cancellation by CPAU.

D. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS

This section D. has been revised to be consistent with the requirements of ANSI/IEEE 1547-2003 *Standard for Interconnecting Distributed Resources with Electric Power Systems* (IEEE 1547). Exceptions are taken to IEEE 1547 Clauses 4.1.4.2 Distribution Secondary Spot Networks and Clauses 4.1.8.1 or 5.1.3.1, which address Protection from Electromagnetic Interference. Note that this Rule and Regulation 27 does not adopt the Generating Facility power limitation of 10 MW incorporated in IEEE 1547.

1. GENERAL INTERCONNECTION AND PROTECTION FUNCTION REQUIREMENTS

The Protective Functions and requirements of this Rule are designed to protect CPAU's Distribution System and not the Generating Facility. Customer shall be solely responsible for providing adequate protection for its Generating Facility and Interconnection Facilities. The Customer's Protective Functions shall not impact the operation of other Protective Functions utilized on CPAU's Distribution System in a manner that would affect CPAU's capability of providing reliable service to its Customers.

a. Protective Functions Required. A Generating Facility operating in parallel with CPAU's Distribution System shall be equipped with the following Protective Functions to sense abnormal conditions on CPAU's Distribution System and cause the Generating Facility to be automatically disconnected from CPAU's Distribution System or to prevent the Generating Facility from being connected to CPAU's Distribution System inappropriately:

i. Over and under voltage trip functions and over and under frequency trip functions;

ii. A voltage and frequency sensing and time-delay Function to prevent the Generating Facility from energizing a de-energized Distribution System circuit and to prevent the Generating Facility from reconnecting with CPAU's Distribution System unless CPAU's Distribution System service voltage and frequency is within the ANSI C84.1-1995 Table 1 Range B Voltage Range of 106V to 127V on a 120V basis, inclusive, and a frequency range of 59.3 Hz to 60.5 Hz, inclusive, and are stable for at least 60 seconds, and;

iii. A Function to prevent the Generating Facility from contributing to the formation of an Unintended Island, and cease to energize the CPAU system within two seconds of the formation of an Unintended Island.

The Generating Facility shall cease to energize CPAU's Distribution System for faults on CPAU's Distribution System circuit to which it is connected (IEEE1547-4.2.1). The Generating Facility shall cease to energize CPAU's Distribution circuit prior to re-closure by CPAU's Distribution System

equipment (IEEE1547-4.2.2).

b. Momentary Paralleling Generating Facilities. With CPAU's approval, the transfer switch or scheme used to transfer the Producer's Loads from CPAU's Distribution System to Producer's Generating Facility may be used in lieu of the Protective Functions required for Parallel Operation.

c. Suitable Equipment Required. Circuit breakers or other interrupting devices located 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 their intended application. This includes being capable of interrupting the maximum available fault current expected at their location. Producer's Generating Facility and Interconnection Facilities shall be designed so that the failure of any one device shall not potentially compromise the safety and reliability of CPAU's Distribution System.

The Generating Facility's paralleling-device shall be capable of withstanding 220% of the Interconnection Facilities' rated voltage (IEEE 1547-4.1.8.3). The Interconnection Facilities shall have the capability to withstand voltage and current surges in accordance with the environments defined in IEEE Std C62.41.2-2002 or IEEE Std C37.90.1-2002 as applicable and as described in IEEE 1547-4.1.8.2.

d. Visible Disconnect Required: The Producer shall furnish and install a ganged, manually-operated isolating switch (or a comparable device mutually agreed upon by CPAU and the Producer) near the Point of Interconnection to isolate the Generating Facility from CPAU's Distribution System. The device does not have to provide overcurrent protection.

The device must:

i. Allow visible verification that separation has been accomplished. (This requirement may be met by opening the enclosure to observe contact separation.) Molded case circuit breakers do not meet the visible contact requirement and are not acceptable as a Visible Disconnect device.

ii. Include markings or signage that clearly indicates open and closed positions.

iii. Be capable of being reached quickly and conveniently 24 hours a day by

CPAU personnel for construction, maintenance, inspection, testing or reading, without obstacles or requiring those seeking access to obtain keys, special permission, or security clearances.

iv. Be capable of being locked in the open position.

v. Be clearly marked on the submitted Single Line Diagram and its type and location approved by CPAU prior to installation. If the device is not adjacent to the Point of Common Coupling (PCC), permanent signage must be installed at a CPAU-approved location providing a clear description of the location of the device. Generating Facilities with Non-Islanding inverters totaling one (1) kilovolt-ampere (kVA) or less are exempt from this requirement.

e. Drawings Required. Prior to Parallel Operation or Momentary Parallel Operation of the Generating Facility, CPAU shall approve the Producer's Protective Function and control diagrams. A Generating Facility equipped with a Protective Function and control scheme previously approved by CPAU for system-wide application or only Certified Equipment may satisfy this requirement by reference to previously approved drawings and diagrams.

f. Generating Facility Conditions Not Identified. In the event this Rule does not address the Interconnection conditions for a particular Generating Facility, CPAU and Producer may agree upon other arrangements, to be approved by CPAU.

2. PREVENTION OF INTERFERENCE

The Producer shall not operate a Generating Facility or Interconnection Facilities that superimpose a voltage or current upon CPAU's Distribution System that interferes with CPAU operations, service to CPAU Customers, or communication facilities. If such interference occurs, the Producer must diligently pursue and take corrective action at its own expense after being given notice and reasonable time to do so by CPAU. If the Producer does not take corrective action in a timely manner, or continues to operate the facilities causing interference without restriction or limit, CPAU may, without liability, disconnect the Producer's facilities from CPAU's Distribution System, in accordance with Section B.8 of this Rule. To eliminate undesirable interference caused by its operation,

each Generating Facility shall meet the following criteria:

a. Voltage Regulation. The Generating Facility shall not actively regulate the voltage at the PCC while in parallel with CPAU's Distribution System. The Generating Facility shall not cause the service voltage at other Customers to go outside the requirements of ANSI C84.1-1995, Range A (IEEE 1547-4.1.1).

b. Operating Voltage Range. The voltage ranges in Table D.1 define protective trip limits for the Protective Function and are not intended to define or imply a voltage regulation Function. A Generating Facility shall cease to energize CPAU's Distribution System within the prescribed trip time whenever the voltage at the PCC deviates from the allowable voltage operating range. The Protective Function shall detect and respond to voltage on all phases to which the Generating Facility is connected.

i. Generating Facilities. Generating Facilities shall be capable of operating within the voltage range normally experienced on CPAU's Distribution System from plus to minus 5% of the nominal voltage (e.g. 114 volts to 126 volts on a 120 volt base), at the service panel or PCC. The trip settings at the generator terminals shall be selected in a manner that minimizes nuisance tripping between 106 volts and 132 volts on a 120-volt base (88-110% of nominal voltage) to compensate for voltage drop between the generator terminals and the PCC. Voltage shall be detected at either the PCC or the Point of Interconnection. However, the voltage range at the PCC with the generator on-line shall stay within +/-5% of nominal.

ii. Voltage Disturbances. Whenever CPAU's Distribution System voltage at the PCC varies from and remains outside normal (nominally 120 volts) by the predetermined amounts set forth in Table D.1, the Generating Facility's Protective Functions shall cause the Generator(s) to become isolated from CPAU's Distribution System.

TABLE D.1: Voltage Trip Settings			
Voltage at Point of Common Coupling		**Maximum Trip Time[(1)]**	
Assuming 120 V Base	% of Nominal Voltage	# of Cycles (Assuming 60 Hz Nominal)	Seconds
Less than 60 Volts	Less than 50%	10 Cycles	0.16 Seconds
Greater than or equal to 60 Volts but less than 106 Volts	Greater than or equal to 50% but less than 88%	120 Cycles	2 Seconds
Greater than or equal to 106 Volts but less than or equal to 132 Volts	Greater than or equal to 88% but less than or equal to 110%	Normal Operation	
Greater than 132 Volts but less than or equal to 144 Volts	Greater than 110% but less than or equal to 120%	60 Cycles	1 Second
Greater than 144 Volts	Greater than 120%	10 Cycles	0.16 Seconds

(1) "Maximum Trip time" refers to the time between the onset of the abnormal condition and the Generating Facility ceasing to energize CPAU's Distribution System. Protective Function sensing equipment and circuits may remain connected to CPAU's Distribution System to allow sensing of electrical conditions for use by the "reconnect" feature. The purpose of the allowed time delay is to allow a Generating Facility to "ride through" short-term disturbances to avoid nuisance tripping. Set points shall not be user adjustable (though they may be field adjustable by qualified personnel).

c. Paralleling. The Generating Facility shall parallel with CPAU's Distribution System without causing a voltage fluctuation at the PCC greater than ±5% of the prevailing voltage level of CPAU's Distribution System at the PCC, and meet the flicker requirements of D.2.d.

d. Flicker. The Generating Facility shall not create objectionable flicker for other Customers on CPAU's Distribution System. To minimize the adverse voltage effects experienced by other Customers (IEEE 1547-4.3.2), flicker at the PCC caused by the Generating Facility should not exceed the limits defined by the "Maximum Borderline of Irritation Curve" identified in IEEE 519-1992 (IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems, IEEE STD 519-1992). This requirement is necessary to minimize the adverse voltage

affects experienced by others Customers on CPAU's Distribution System. Generators may be connected and brought up to synchronous speed (as an induction motor) provided these flicker limits are not exceeded.

e. Integration with CPAU's Distribution System Grounding. The grounding scheme of the Generating Facility shall not cause over-voltages that exceed the rating of the equipment connected to CPAU's Distribution System and shall not disrupt the coordination of the ground fault protection on CPAU's Distribution System (IEEE 1547-4.1.2).

f. Frequency. The Generating Facility shall operate in synchronism with CPAU's Distribution System. Whenever CPAU's Distribution System Frequency at the PCC varies from and remains outside normal (nominally 60 Hz) by the predetermined amounts set forth in Table D.2, the Generating Facility's Protective Functions shall cease to energize CPAU's Distribution System within the stated maximum trip time.

TABLE D.2: Frequency Trip Settings

Generating Facility Rating	**Frequency Range (Assuming 60 Hz Nominal)**	**Maximum Trip Time [(1)] (Assuming 60 Cycles per Second**
Less or equal to 30 kW	Less than 59.3 Hz	10 Cycles
	Greater than 60.5 Hz	10 Cycles
Greater than 30 kW	Less than 57 Hz	10 Cycles
	Less than an adjustable value between 59.8 Hz and 57 Hz but greater than 57 Hz [(2)]	Adjustable between 10 and 18,000 Cycles [(2),(3)]
	Greater than 60.5 Hz	10 Cycles

1) "Maximum Trip time" refers to the time between the onset of the abnormal condition and the Generating Facility ceasing to energize CPAU's Distribution System. Protective Function sensing equipment and circuits may remain connected to CPAU's Distribution System to allow sensing of electrical conditions for use by the "reconnect" feature. The purpose of the allowed time delay is to allow a Generating Facility to "ride through" short-term disturbances to avoid nuisance tripping. Set points shall not be user adjustable (though they may be field adjustable by qualified personnel).

(2) Unless otherwise required by CPAU, a trip frequency of 59.3 Hz and a maximum trip time of 10 cycles shall be used.

(3) When a 10-cycle maximum trip time is used, a second under frequency trip setting is not required.

g. Harmonics. When the Generating Facility is serving balanced linear Loads, harmonic current injection into CPAU's Distribution System at the PCC shall not exceed the limits stated below in Table D.3. The harmonic current injections shall be exclusive of any harmonic currents due to harmonic voltage distortion present in CPAU's Distribution System without the Generating Facility connected (IEEE 1547-4.3.3). The harmonic distortion of a Generating Facility located at a Customer's site shall be evaluated using the same criteria as for the Host Loads.

Table D.3 Maximum Harmonic Current Distortion in Percent of Current (I)[1,2]

Individual Harmonic Order h, (odd harmonics) [3]	h<11	11 ≤ h < 17	17 ≤ h < 23	23 ≤ h < 35	35 ≤ h	Total Demand distortion (TDD)
Max Distortion (%)	4.0	2.0	1.5	0.6	0.3	5.0

(1) IEEE 1547-4.3.3

(2) I = the greater of the maximum Host Load current average Demand over 15 or 30 minutes without the GF, or the GF rated current capacity (transformed to the PCC when a transformer exists between the GF and the PCC).

(3) Even harmonics are limited to 25% of the odd harmonic limits above.

h. Direct Current Injection. Generating Facilities should not inject direct current greater than 0.5% of rated output current into CPAU's Distribution System.

i. Power Factor. Each Generator in a Generating Facility shall be capable of operating at some point within a Power Factor range from 0.9 leading to 0.9 lagging. Operation outside this range is acceptable provided the reactive power of the Generating Facility is used to meet the reactive power needs of the Host Loads or that reactive power is otherwise provided under tariff by CPAU. The Producer shall notify CPAU if it is using the Generating Facility for Power Factor correction. Unless otherwise agreed upon by the Producer and CPAU, Generating Facilities shall automatically

regulate Power Factor, not voltage, while operating in parallel with CPAU's Distribution System.

3. TECHNOLOGY SPECIFIC REQUIREMENTS

a. Three-Phase Synchronous Generators. For three-phase Generators, the Generating Facility circuit breakers shall be three-phase devices with electronic or electromechanical control. The Producer shall be responsible for properly synchronizing its Generating Facility with CPAU's Distribution System by means of either manual or automatic synchronizing equipment. Automatic synchronizing is required for all synchronous Generators that have a Short Circuit Contribution Ratio (SCCR) exceeding 0.05. Loss of synchronism protection is not required except as may be necessary to meet D.2.d (Flicker) (IEEE 1547-4.2.5). Unless otherwise agreed upon by the Producer and CPAU, synchronous Generators shall automatically regulate Power Factor, not voltage, while operating in parallel with CPAU's Distribution System. A power system stabilization function is specifically not required for Generating Facilities under 10 MW Net Nameplate Rating. Ground Fault Protection is required for generators $\geq$ 40 kW. Voltage Restraint Overcurrent or Voltage Controlled Overcurrent relays are required for generators or a group of generators $\geq$ 400 kW.

b. Induction Generators. Induction Generators (except self-excited Induction Generators) do not require a synchronizing Function. Starting or rapid Load fluctuations on induction Generators can adversely impact CPAU's 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 Producer's side of the Point of Common Coupling, CPAU must review these measures. Additional equipment may be required as determined in a Supplemental Review or a Detailed Study.
Ground Fault Protection is required for generators $\geq$ 40 kW. Voltage Restraint Overcurrent or Voltage Controlled Overcurrent relays are required for generators or a group of generators $\geq$ 400 kW.

c. Inverters. Only Certified inverters are approved for interconnection. Utility-interactive inverters do not require separate synchronizing equipment. Non-utility-interactive or "stand-alone" inverters shall not be used for Parallel Operation with

CPAU's Distribution System. Inverters or a group of inverters ≥ 400 kW require Ground Fault Protection.

Inverter based systems not classified as "Smart Inverters" may continue to be installed per Section D.3.c until September 8, 2017, which is twelve (12) months after the date the Supplement SA of UL-1741 (with California requirements) was approved. Section D.5 may be used in all or in part, for inverter based technologies by mutual agreement of CPAU and the Applicant.

The replacement of an existing inverter to an inverter that is of equal or greater ability than the original is allowed per Section D.3.c. Section D.5 may be used in all or in part, for replacement inverter based technologies by mutual agreement of CPAU and the Applicant.

d. Single-Phase Generators. For single-phase Generators connected to a shared single-phase secondary system, the maximum Net Nameplate Rating of the Generating Facilities shall be 20 kVA. Generators connected to a center-tapped service neutral must be installed such that no more than 6 kVA of unbalanced power is applied to the two "legs" of the service. The current in the most heavily loaded leg must not exceed twice that of the other leg. For Dedicated Distribution Transformer Services, the maximum Net Nameplate Rating of a single-phase Generating Facility shall be the transformer nameplate rating.

4. SUPPLEMENTAL GENERATING FACILITY REQUIREMENTS

a. Fault Detection. A Generating Facility with an SCCR exceeding 0.1 or one that does not cease to energize CPAU's Distribution System within two seconds of the formation of an Unintended Island shall be equipped with Protective Functions designed to detect Distribution System faults, both line-to-line and line-to-ground, and shall cease to energize CPAU's Distribution System within two seconds of the initiation of a fault.

b. Transfer Trip. For a Generating Facility that cannot detect Distribution System faults (both line-to-line and line-to-ground) or the formation of an Unintended Island, and cease to energize CPAU's Distribution System within two seconds, CPAU may require a Transfer Trip system or an equivalent Protective Function. For net metered

or non-net metered Generating Facilities, the Facility will be considered capable of supporting an Unintended Island if the aggregate distributed generation output is 80% or more of the Distribution System real-time load kW seen at CPAU's source-side Distribution Protection Device.

c. Reclose Blocking. Where the aggregate Generating Facility capacity exceeds 15% of the peak Load on any automatic reclosing device, CPAU may require additional Protective Functions, including, but not limited to reclose-blocking on some of the automatic reclosing devices.

5. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS

Section D.3.c shall continue to be used for interconnection of inverter based technologies until September 8, 2017, twelve (12) months after the date the Supplement SA of UL-1741 (with CA requirements) was approved by the full UL-1741 Standards Technical Panel (STP). Following such date, Section D.5 shall apply for interconnection of inverter based technologies. Until such date, Section D.5 may be used in all or in part, for inverter based technologies by mutual agreement of the CPAU and the Applicant.

The inverter requirements are intended to be consistent with ANSI/IEEE 1547- 2003 and 1547a Standard for Interconnecting Distributed Resources with Electric Power Systems (IEEE 1547 including amendment 1547a). In the event of conflict between this Rule and IEEE 1547-2003, this Rule shall take precedence. Exceptions are taken to IEEE 1547 Clauses 4.1.4.2 Distribution Secondary Spot Networks and Clauses 4.1.8.1 or 5.1.3.1, which address Protection from Electromagnetic Interference. Rule 27 does not adopt the Generating Facility power limitation of 10 MW incorporated in IEEE1547.

a. Protective Functions Required. Smart Inverters operating in parallel with CPAU's Distribution System shall be equipped with the following Protective Functions to sense abnormal conditions on CPAU's Distribution System and cause the Smart Inverter to be automatically disconnected from CPAU's Distribution System or to prevent the Smart Inverter from being connected to CPAU's Distribution System inappropriately:

i. Over and under voltage trip functions and over and under frequency trip functions;

ii. A voltage and frequency sensing and time-delay function to prevent the Smart Inverter from energizing a de-energized Distribution System circuit and to prevent the Smart Inverter from reconnecting with CPAU's System unless CPAU's Distribution System service voltage and frequency is within the ANSI C84.1-1995 Table 1 Range B voltage Range of 106 volts to 127 volts (on a 120 volt basis), inclusive, and a frequency range of 59.3 Hz to 60.5 Hz, inclusive, and are stable for at least 15 seconds; and

iii. A function to prevent the Smart Inverter from contributing to the formation of an Unintended Island, and cease to energize CPAU's Distribution System within two seconds of the formation of an Unintended Island.

iv. Only Certified Smart Inverters are approved for interconnection. Smart Inverters or a group of Smart Inverters $\geq$ 400 kW require Ground Fault Protection.

The Smart Inverter shall cease to energize CPAU's Distribution System for faults on CPAU's Distribution System circuit to which it is connected (IEEE 1547-4.2.1). The Smart Inverter shall cease to energize CPAU's Distribution circuit prior to reclosing by CPAU's Distribution System equipment (IEEE 1547-4.2.2).

b. Momentary Paralleling Generating Facilities. With CPAU's approval, the transfer switch or scheme used to transfer Producer's loads from CPAU's Distribution System to Producer's Generating Facility may be used in lieu of the Protective Functions required for Parallel Operation.

c. Suitable Equipment Required. Circuit breakers or other interrupting equipment located at the PCC must be Certified or "Listed" (as defined in Article 100, the Definitions Section of the National Electrical Code) as suitable for their intended application. This includes being capable of interrupting the maximum available fault current expected at their location. Producer's Smart Inverter and Interconnection Facilities shall be designed so that the failure of any single device or component shall

not potentially compromise the safety and reliability of CPAU's Distribution System. The Smart Inverter paralleling-device shall be capable of withstanding 220% of the Interconnection Facility rated voltage (IEEE 1547- 4.1.8.3). The Interconnection Facility shall have the capability to withstand voltage and current surges in accordance with the environments defined in IEEE Std. C62.41.2-2002 or IEEE Std. C37.90.1-2002 as applicable and as described in L.3.e (IEEE 1547- 4.1.8.2).

d. Visible Disconnect Required. Producer shall furnish and install a ganged, manually-operated isolating switch (or a comparable device mutually agreed upon by CPAU and Producer) near the Point of Common Coupling to isolate the Smart Inverter from CPAU's Distribution System. The device does not have to provide over-current protection.

The device must:

i. Allow visible verification that separation has been accomplished. (This requirement may be met by opening the enclosure to observe contact separation.) Molded case circuit breakers do not meet the visible contact requirement and are not acceptable as a Visible Disconnect device.

ii. Include markings or signage that clearly indicates open and closed positions.

iii. Be capable of being reached quickly and conveniently 24 hours a day by CPAU personnel for construction, maintenance, inspection, testing or reading, without obstacles or requiring those seeking access to obtain keys, special permission, or security clearances.

iv. Be capable of being locked in the open position.

v. Be clearly marked on the submitted single line diagram and its type and location approved by CPAU prior to installation. If the device is not adjacent to the PCC, permanent signage must be installed at a CPAU approved location providing a clear description of the location of the device. If the switch is not accessible outside the locked premises, signage with contact information and a CPAU approved locking device for the premises shall be installed. Generating Facilities with Non-Islanding inverters totaling one (1)

kilovolt-ampere (kVA) or less are exempt from this requirement.

e. Drawings Required. Prior to Parallel Operation or Momentary Parallel Operation of the Smart Inverter, CPAU shall approve Producer's Protective Function and control diagrams. Generating Facilities equipped with Protective Functions and a control scheme previously approved by CPAU for system-wide application or only Certified Equipment may satisfy this requirement by reference to previously approved drawings and diagrams.

f. Generating Facility Conditions Not Identified. In the event this Rule does not address the Interconnection conditions for a particular Smart Inverter, CPAU and Producer may agree upon other arrangements, to be approved by CPAU.

g. Prevention of Interference. Producer shall not operate Smart Inverters that superimpose a voltage or current upon CPAU's Distribution System that interferes with CPAU operations, service to CPAU Customers or communication facilities. If such interference occurs, Producer must diligently pursue and take corrective action at its own expense after being given notice and reasonable time to do so by CPAU. If Producer does not take corrective action in a timely manner, or continues to operate the facilities causing interference without restriction or limit, CPAU may, without liability, disconnect Producer's facilities from CPAU's Distribution System, in accordance with Section B.8 of this Rule.

h. Voltage Regulation. If approved by CPAU, the Smart Inverter may actively regulate the voltage at the Point of Common Coupling (PCC) while in parallel with CPAU's Distribution System. The Smart Inverter shall not cause the service voltage at other customers to go outside the requirements of ANSI C84.1-1995, Range A (IEEE 1547-4.1.1).

i. Voltage Trip and Ride-Through Settings. The voltage ranges in Table D.4 define protective trip limits for the Protective Function and are not intended to define or imply a voltage regulation Function. Generating Facilities shall cease to energize CPAU's Distribution System within the prescribed trip time whenever the voltage at the PCC deviates from the allowable voltage operating range. The Protection Function shall detect and respond to voltage on all phases to which the Generating Facility is connected.

j. Smart Inverters. Smart Inverters shall be capable of operating within the voltage range normally experienced on CPAU's Distribution System from plus to minus 5% of the nominal voltage (e.g. 114 volts to 126 volts, on a 120 volt base), at the service panel or PCC. The trip settings at the generator terminals may be selected in a manner that minimizes nuisance tripping in accordance with Table D.4 to compensate for voltage drop between the generator terminals and the PCC. Voltage may be detected at either the PCC or the Point of Interconnection. However, the voltage range at the PCC, with the generator on-line, shall stay within +/-5% of nominal.

k. Voltage Disturbances. Whenever CPAU's Distribution System voltage at the PCC varies from and remains outside Near Nominal voltage for the predetermined parameters set forth in Table D.4, the Smart Inverter's Protective Functions shall cause the Smart Inverter(s) to become isolated from CPAU's Distribution System:

i. The Smart Inverter shall stay connected to CPAU's Distribution System while the grid remains within the "Ride-Through Until" voltage-time range and must stay connected in the corresponding "Operating Mode".

ii. For voltage excursions beyond the near Nominal (NN) magnitude range and within the range of the HV1 or LV3 regions, the Smart Inverter shall momentarily cease to energize within 0.16 seconds.

iii. In the HV1 region, the Smart Inverter is permitted to reduce power output as a function of voltage under mutual agreement between the Producer and CPAU.

iv. If the distribution system voltage does not exit the ride-through region and recovers to normal system voltage, the Smart Inverter shall restore continuous operation within 2 seconds.

v. If the CPAU's Distribution System voltage does not exit the ride-through region and returns from the LV3 region to the LV2 or LV1 region, the Smart Inverter shall restore available current within 2 seconds.

vi. Different voltage-time settings could be permitted by CPAU.

Table D.4: Voltage Ride-Through Table				
Region	**Voltage at Point of Common Coupling (% Nominal Volts)**	**Ride-Through Until**	**Operating Mode**	**Maximum Trip Time**
High Voltage 2 (HV2)	$V \geq 120$			0.16 seconds
High Voltage 1 (HV1)	$110 < V < 120$	12 seconds	Momentary Cessation	13 seconds
Near Nominal (NN)	$88 \leq V \leq 110$	Indefinite	Continuous Operation	Not Applicable
Low Voltage 1 (LV1)	$70 \leq V < 88$	20 seconds	Mandatory Operation	21 seconds
Low Voltage 2 (LV2)	$50 \leq V < 70$	10 seconds	Mandatory Operation	11 seconds
Low Voltage 3 (LV3)	$V < 50$	1 second	Momentary Cessation	1.5 seconds

l. Paralleling. The Generating Facility shall parallel with CPAU's Distribution System without causing a voltage fluctuation at the PCC greater than plus/minus 5% of the prevailing voltage level of CPAU's Distribution System at the PCC, and meet the flicker requirements of Section D.5.m below.

m. Flicker. The Generating Facility shall not create objectionable flicker for other customers on CPAU's Distribution System. To minimize the adverse voltage effects experienced by other customers (IEEE 1547-4.3.2), flicker at the PCC caused by the Generating Facility should not exceed the limits defined by the "Maximum Borderline of Irritation Curve" identified in IEEE 519-1992 (IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems, IEEE STD 519-1992). This requirement is necessary to minimize the adverse voltage affects experienced by other Customers on CPAU's Distribution System. Generators may be connected and brought up to synchronous speed (as an induction motor)

provided these flicker limits are not exceeded.

n. Integration with CPAU's Distribution System Grounding. The grounding scheme of the Generating Facility shall not cause over-voltages that exceed the rating of the equipment connected to CPAU's Distribution System and shall not disrupt the coordination of the ground fault protection on CPAU's Distribution System (IEEE 1547-4.1.2).

o. Frequency. CPAU controls system frequency, and the Generating Facility shall operate in synchronism with CPAU's Distribution System. Whenever CPAU's Distribution System frequency at the PCC varies from and remains outside normal (nominally 60 Hz) by the predetermined amounts set forth in Table D.2, the Generating Facility's Protective Functions shall cease to energize CPAU's Distribution System within the stated maximum trip time.

p. Frequency Ride-Through Requirements. Smart Inverter based systems shall remain connected to CPAU's Distribution System while the grid is within the frequency-time range indicated in Table D.5, and shall disconnect from the electric grid during a high or low frequency event that is outside that frequency-time range. The frequency values are shown in Table D.5. These values provide default interconnection system response to abnormal frequencies. The inverter shall disconnect by the default clearing times. In the high frequency range between 60.2 Hz and 61.5 Hz, or some other mutually agreed range, the Smart Inverter is permitted to reduce real power output until it ceases to export power by 61.5 Hz, or other frequency value mutually agreed between the generating facility operator and CPAU. Islands and microgrids may need different default frequency settings.

Table D.5: Frequency Ride-Through and Trip Settings Table				
System Frequency Default Settings (Hz)	**Minimum Range of Adjustability (Hz)**	**Ride-Through Until**	**Ride –Through Operational Mode**	**Maximum Trip Time**
f > 62	62 – 64	No Ride Through	Not Applicable	0.16 seconds
60.5 < f ≤ 62	60.1 – 62	299 seconds	Mandatory Operation	300 seconds
58.5 ≤ f ≤ 60.5	Not Applicable	Indefinite	Continuous Operation	Not Applicable
57.0 ≤ f < 58.5	57 – 59.9	299 seconds	Mandatory Operation	300 seconds
f < 57.0	53 – 57	No Ride Through	Not Applicable	0.16 seconds

q. Harmonics. When the Smart Inverter is serving balanced linear loads, harmonic current injection into CPAU's Distribution System at the PCC shall not exceed the limits stated in Table D.3. The harmonic current injections shall be exclusive of any harmonic currents due to harmonic voltage distortion present in CPAU's Distribution System without the Smart Inverter connected (IEEE 1547-4.3.3.). The harmonic distortion of a Smart Inverter shall be evaluated using the same criteria as for the Host Loads.

r. Direct Current Injection. Smart Inverter should not inject direct current greater than 0.5% of rated output current into CPAU's Distribution System.

s. Power Factor. Producer shall provide adequate reactive power compensation on site to maintain the Smart Inverter power factor near unity at rated output or a CPAU specified power factor in accordance with the following requirements:

i. Default Power Factor setting: 1.0 +/- 0.01 (0.99 Lagging to 0.99 Leading).

ii. Aggregate generating facility is greater than 15 kW: 1.0 +/- 0.15 (0.85

Lagging to 0.85 Leading) down to 20% rated power based on available reactive power.

iii. Aggregate generating facility is less than or equal to 15 kW: 1.0 +/- 0.10 (0.90 Lagging to 0.90 Leading) down to 20% rated power based on available reactive power.

t. Dynamic Volt/VAR Operations. The Smart Inverter shall be capable of operating dynamically within a power factor range of +/- 0.85 PF for larger (>15 kW) systems, down to 20% of rated power, and +/- 0.9 PF for smaller systems (≤15 kW), down to 20% of rated power, based on available reactive power. This dynamic Volt/VAR capability shall be able to be activated or deactivated in accordance with CPAU requirements.

CPAU may permit or require the Smart Inverter systems to operate in larger power factor ranges, including in 4-quadrant operations for storage systems with the implementation of additional anti-islanding protection as determined by CPAU.

The Smart Inverter shall be capable of providing dynamic reactive power compensation (dynamic Volt/VAR operation) within the following constraints:

- The Smart Inverter shall not cause the line voltage at the point of common coupling to go outside the requirements of the latest version of ANSI C84.1, Range A.

- The Smart Inverter shall be able to consume reactive power in response to an increase in line voltage, and produce reactive power in response to a decrease in line voltage.

- The reactive power provided shall be based on available reactive power, but the maximum reactive power provided to the system shall be as directed by CPAU.

u. Ramp Rate Requirements. The Smart Inverter is required to have the following ramp controls for at least the following two conditions. These functions can be established by multiple control functions or by one general ramp rate control function. Ramp

rates are contingent upon sufficient energy available from the Smart Inverter.

- Normal ramp-up rate: For transitions between energy output levels over the normal course of operation. The default value is 100% of maximum current output per second with a range of adjustment between 1% to 100%, with specific settings as mutually agreed by the CPAU and the Producer.

- Connect/Reconnect Ramp-up rate: Upon starting to inject power into the grid, following a period of inactivity or a disconnection, the inverter shall be able to control its rate of increase of power from 1 to 100% maximum current per second, with specific settings as mutually agreed upon by CPAU and the Producer.

v. Default Activation States for Phase 1 Functions. Unless otherwise provided by CPAU, the default settings will be as follows:

- Anti-islanding – activated
- Low/High Voltage Ride-Through – activated
- Low/High Frequency Ride-Through – activated
- Dynamic Volt/VAR operations – deactivated
- Ramp rates – activated
- Fixed power factor – activated
- Reconnect by "soft-start" methods – activated

These default activation states may be modified by mutual agreement between CPAU and Producer.

w. Automatic Transfer (Load Shedding or Transfer). The voltage and frequency ride-through requirements of D.5.i and D.5.m shall not apply if either: a) The real power across the Point of Common Coupling is continuously maintained at a value less than

10% of the aggregate rating of the Smart Inverters connected to the Generation Facility prior to any voltage disturbance, and the Generation Facility disconnects from CPAU's distribution system, along with Generation Facility load, such that the net change in real power flow from or to CPAU is less than 10% of the aggregate Smart Inverter capacity; or b) Generation Facility load real power demand equal to 90% to 120% of the pre-disturbance aggregate Smart Inverter real power output is shed within 0.1 seconds of Smart Inverter disconnection.

x. Fault Detection. A Smart Inverter with an SCCR exceeding 0.1 or one that does not cease to energize CPAU's Distribution System within two seconds of the formation of an Unintended Island shall be equipped with Protective Functions designed to detect Distribution System faults, both line-to-line and line-to-ground, and cease to energize CPAU's Distribution System within two seconds of the initiation of a fault.

y. Transfer Trip. For a Generating Facility that cannot detect Distribution System faults (both line-to-line and line-to-ground) or the formation of an Unintended Island, and cease to energize CPAU's Distribution System within two seconds, CPAU may require a Transfer Trip system or an equivalent Protective Function.

z. Reclose Blocking. Where the aggregate Generating Facility capacity exceeds 15% of the peak load on any automatic reclosing device, CPAU may require additional Protective Functions, including, but not limited to reclose-blocking on some of the automatic reclosing devices.

E. INTERCONNECTION FACILITIES AND DISTRIBUTION SYSTEM MODIFICATIONS OWNERSHIP AND COST ALLOCATION

1. SCOPE AND OWNERSHIP OF INTERCONNECTION FACILITIES AND DISTRIBUTION SYSTEM MODIFICATIONS

a. Scope. Parallel Operation of Generating Facilities may require Interconnection Facilities or modifications to CPAU's Distribution System ("Distribution System modifications"). The type, extent and costs of Interconnection Facilities and Distribution System modifications shall be consistent with this Rule and determined through the Supplemental Review and/or Interconnection Studies described in Section C.

b. Ownership. Interconnection Facilities installed on Producer's side of the PCC may be owned, operated and maintained by the Producer or CPAU. Interconnection Facilities installed on CPAU's side of the PCC and Distribution System modifications shall be owned, operated and maintained only by CPAU.

2. RESPONSIBILITY OF COSTS OF INTERCONNECTING A GENERATING FACILITY

a. Study and Review Costs. A Producer shall be responsible for the reasonably incurred costs of the reviews and studies conducted pursuant to Section C.1 of this Rule.

b. Facility Costs. A Producer shall be responsible for all costs associated with Interconnection Facilities owned by the Producer. The Producer shall also be responsible for any costs reasonably incurred by CPAU in providing, operating, or maintaining the Interconnection Facilities and Distribution System modifications required for the Interconnection of the Producer's Generating Facility with CPAU's Distribution System.

c. Separation of Costs. Should CPAU combine the installation of Interconnection Facilities or Distribution System modifications required for the Interconnection of a Generating Facility with modifications to CPAU's Distribution System to serve other Customers or Producers, CPAU shall not include the costs of such separate or incremental facilities in the amounts billed to the Producer.

d. Payments. The Producer must pay applicable costs prior to the scheduling of any engineering reviews and studies; construction of distribution system modifications; or interconnection of generating facilities to CPAU's Distribution System.

3. INSTALLATION AND FINANCING OF INTERCONNECTION FACILITIES AND DISTRIBUTION SYSTEM MODIFICATIONS

a. Agreement Required. The costs for Interconnection Facilities and Distribution System modifications shall be paid by the Producer pursuant to the Provisions contained in the Special Facilities Agreement. Where the type and extent of the

Interconnection Facilities or Distribution System modifications warrant additional detail, Producer and CPAU shall execute separate agreement(s) to more fully describe and allocate the parties' responsibilities for installing, owning, operating and maintaining the Interconnection Facilities and Distribution System modifications.

b. Interconnection Facilities and Distribution System Modifications. Interconnection Facilities connected to CPAU's side of the Point of Common Coupling and Distribution System modifications shall be provided, installed, owned and maintained by CPAU at Producer's expense.

c. Reservation of Unused Facilities. When a Producer wishes to reserve CPAU-owned Interconnection Facilities or Distribution System modifications installed and operated as Special Facilities for the Producer at Producer's expense, but idled by a change in the operation of the Producer's Generating Facility or otherwise, Producer may elect to abandon or reserve such facilities consistent with the terms of its agreement with CPAU. If Producer elects to reserve idle Interconnection Facilities or Distribution System modifications, CPAU shall be entitled to continue to Charge Producer for the costs related to the ongoing operation and maintenance of the Special Facilities.

d. Refund of Salvage Value. When a Producer elects to abandon the Special Facilities for which it has either advanced the installed costs or constructed and transferred to CPAU, the Producer shall not receive a credit for the net salvage value of the Special Facilities.

F. METERING, MONITORING AND TELEMETRY

1. GENERAL REQUIREMENTS

All Generating Facilities shall be metered in accordance with this Section F and shall meet all applicable standards of CPAU contained in CPAU's applicable rules and published CPAU manuals dealing with Metering specifications. For general metering requirements, see CPAU Rule and Regulation 15. For net metering requirements, see CPAU Rule and Regulation 29.

2. METERING BY CPAU

The ownership, installation, operation, reading and testing of revenue Metering Equipment

for Generating Facilities shall be by CPAU only.

3. NET GENERATION METERING

For purposes of monitoring Generating Facility operation to determine standby Charges and applicable non-bypassable Charges as defined in CPAU's tariffs, and for Distribution System planning and operations, consistent with Section B.4 of this Rule, CPAU shall have the right to specify the type, and require the installation of Net Generation Metering equipment. CPAU shall only require Net Generation Metering to the extent that less intrusive and/or more cost effective options for providing the necessary Generating Facility output data are not available. In exercising its discretion to require Net Generation Metering, CPAU shall consider all relevant factors, including but not limited to:

a. Data requirements in proportion to need for information;
b. Producer's election to install equipment that adequately addresses CPAU's operational requirements;
c. Accuracy and type of required Metering consistent with purposes of collecting data;
d. Cost of Metering relative to the need for and accuracy of the data;
e. The Generating Facility's size relative to the cost of the Metering/monitoring;
f. Other means of obtaining the data (e.g., Generating Facility logs, proxy data etc.); and
g. Requirements under any Interconnection Agreement with the Producer.

4. POINT OF COMMON COUPLING METERING

For purposes of assessing CPAU Charges for retail service, the Producer's PCC Metering shall be reviewed by CPAU, and if required, replaced to ensure that it will appropriately measure Electric power according to the Provisions of the Customer's Electric Service tariff. Where required, the Customer's existing Meter may be replaced with a bi-directional meter so that power deliveries to and from the Producer's site can be separately recorded. Alternately, the Producer may, at its sole option and cost, require CPAU to install Multi-Metering Equipment to separately record power deliveries to CPAU's Distribution System and retail purchases from CPAU. Where necessary, such PCC Metering shall be designed to prevent reverse registration.

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 Producer's expense. If the Generating Facility is interconnected to a portion of CPAU's Distribution System operating at a voltage below 10 kV, then Telemetering equipment may be required on Generating Facilities 250 kW or greater. CPAU 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. LOCATION

Where CPAU-owned Metering is located on the Producer's Premises, Producer shall provide, at no expense to CPAU, a suitable location for all such Metering Equipment as set forth in CPAU Rule and Regulation 15.

7. COSTS OF METERING

The Producer will bear all costs of the Metering required by this Rule, including the incremental costs of operating and maintaining the Metering Equipment.

(END)