1.0 SCOPE

1.1. This standard contains the requirements for any Customer Generation facilities less than 200 kW output where such generation may be interconnected for parallel operation with the EWEB electric distribution system.

2.0 DEFINITIONS

2.1. Customer Generation Facility (CG Facility): Electrical generating equipment that is located within a Customer's site and that is interconnected in parallel to the EWEB electric distribution system. Customer Generation includes generator(s) or inverter(s), together with all other protective, safety, and associated equipment necessary to produce electric power and interconnect the generator with the EWEB electric distribution system.

2.2. Generation-Type CG Facility: CG Facility that is configured to deliver electric output from the CG system to the EWEB electric distribution system instead of offsetting customer electric load. The generation system is interconnected to the EWEB electric distribution system through a separate meter and service entrance.

2.3. Net Metered-Type CG Facility: CG Facility that is interconnected in parallel to the EWEB electric distribution system on the Customer's side of the meter, and is intended primarily to offset part or all of the Customer's requirements for electricity. A separate service and meter is not required for a net metered CG facility.

2.4. Parallel Interconnection: A generator that is electrically interconnected to a bus common with the EWEB electric distribution system, either on a momentary or continuous basis. A consequence of such interconnected operation is that the generator becomes an integral part of the utility system that must be considered in the electrical protection of the utility system.

3.0 INTERCONNECTION REQUIREMENTS

3.1. CG facilities shall conform to all applicable National Electrical Code (NEC) requirements, applicable building and electrical codes, and Customer shall obtain all electrical permits and any other required permits for the facility installation. The separate service required for a generation-type CG facility shall meet all requirements of EWEB's Customer Services Policies and Procedures.

3.2. All photovoltaic (PV) modules, inverters, and battery energy storage systems shall be listed in the California Energy Commission's Solar Equipment List.

3.3. Battery storage systems shall isolate themselves from EWEB's electric distribution system through automatic means when the battery system switches to backup mode. The battery system shall not dispatch power onto EWEB's electric distribution system.

3.4. The Customer generator must be connected on the load side of the meter base. Connecting the generator using a "meter collar" between the meter base and EWEB's meter is not allowed.

3.5. Customer shall install and maintain a single manual, gang-operated, load-break, UL-listed Disconnect Switch located on the load side of the EWEB service meter to provide the ability to open the connection of the CG Facility's AC power output to the EWEB electric distribution system.

3.5.a. A disconnect switch is not required if the generation system meets all the following conditions:

3.5.a.1. Inverted based and UL1741-certified anti-islanding.

3.5.a.2. AC output is 25 kW or less.

3.5.a.3. Service is less than 600 volts and metered with a self-contained meter. A disconnect switch is required for all generation systems connected to CT metered services.

3.5.b. Disconnect Switch may be fused or non-fused. If fused, Customer is responsible for properly sizing fuses and replacing any failed fuses.

3.5.c. Disconnect Switch shall be capable of being locked in a visibly open position by a standard EWEB padlock that will completely isolate the CG facility from the EWEB electric distribution system. The Disconnect Switch blades, jaws and the air-gap between them shall all be clearly visible when the switch is in the open position. It is not acceptable to have any of the visible open components obscured by the switch case or an arc-shield, etc. Only switches specifically designed to provide a true visible open are acceptable.

3.5.d. Disconnect Switch shall be installed in a place to provide easy and unrestricted accessibility to EWEB personnel on a 24-hour basis. It shall be installed within site and within five feet of the EWEB meter.

3.5.e. Disconnect Switch shall have provisions for locking in closed position with standard EWEB double hasp. Customer shall provide a lock on one side of the hasp and EWEB will install an EWEB lock on the other side of the hasp which will allow either the Customer or EWEB to remove one lock, remove the double hasp and open the disconnect switch.

3.5.f. EWEB shall have the right to lock open the Disconnect Switch without notice to Customer when interconnected operation of the CG facility could adversely affect the EWEB electric distribution system or endanger life or property.

3.5.g. The Disconnect Switch shall be rated for the voltage, load and short circuit current requirements of the CG facility, and shall meet all applicable UL, NEMA, ANSI and IEEE standards.

3.5.h. The switch enclosure shall be NEMA 250 Type 3R and shall be properly grounded per the requirements of the National Electrical Code (NEC).

3.6. Customer's overcurrent device at the service panel shall be marked to indicate circuit is a power source and is connected to the EWEB electric distribution system.

3.7. Customer generating equipment must deliver at the EWEB service meter, nominal 60 Hertz, either single or three-phase power at one standard voltage compatible with EWEB's interfacing facilities as specified by EWEB. Output shall be balanced between phases as equally as practical.

3.8. CG facilities and power output control systems shall comply with NEC Articles 690 and 705; Institute of Electrical and Electronics Engineers (IEEE) Standards 929, 519 and 1547; Underwriters Laboratories (UL) Standard 1741; which identify minimum specifications and functional standards for parallel operation with the EWEB electric distribution system, including but not limited to:

3.8.a. Power output control system shall have anti-islanding capability and for inverter-based generators, shall be certified as Utility Interactive per IEEE 929 and UL 1741 requirements. These requirements provide for the automatic disconnection of CG facilities from EWEB upon loss of

EWEB source voltage and prevent CG facility reconnection until EWEB source voltage has been safely restored. CG facilities can power the customer load upon loss of the EWEB source voltage if CG facility is isolated from the EWEB electric distribution system by an EWEB-approved transfer switch.

3.8.b. Power output control system shall automatically disconnect from EWEB electric distribution system if Customer's voltage fluctuates beyond plus or minus 10%. Photovoltaic systems shall meet the requirements of Table 2 of IEEE 929, IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems.

3.8.c. Power output control system shall automatically disconnect from the EWEB electric distribution system if Customer and EWEB's frequency fluctuates plus or minus one hertz for one cycle.

3.8.d. The power factor of the CG facility shall not be less than 95% lagging (based on peak KW and KVAR readings) as referenced from the EWEB electric distribution system, but shall not be leading unless agreed to by EWEB in writing.

3.8.e. The electrical output of the CG facility shall not contain harmonic content which may cause disturbances on or damage to the EWEB electric distribution system, or other party's systems, such as but not limited to computer, telephone, communication and other sensitive electronic or control systems. The harmonic output of the CG facility shall comply with the practices and requirements specified in the most current version of IEEE Std. 519 IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems.

3.8.f. If Customer utilizes the EWEB electric distribution system to facilitate start-up of its generating facility, the voltage flicker level shall not exceed EWEB standards. Voltage flicker is caused by voltage variations from load fluctuations that can be visually detected as flickering of lighting systems. In general, any voltage flicker should not exceed the limits defined by the Maximum Borderline of Irritation Curve identified in IEEE Std. 519.

3.9. If the proposed CG Facility is served by **EWEB's secondary distribution network system**, it shall meet the requirements listed below. Additional evaluation, technical requirements, equipment, and testing may be required. Any additional expense is the responsibility of the Customer.

3.9.a. Shall be configured as a net-metered service.

3.9.b. Shall be an inverter-based generator.

3.9.c. The maximum size of generator shall be 25% of the minimum load of the facility, as determined by EWEB.

3.9.d. Shall be provided with controls to monitor the net load of the facility (facility load – generator output) with a utility grade under-power relay, Basler Electric model BE3-37, or equal, as determined by EWEB, to automatically disconnect the generator from the EWEB electric distribution system when the instantaneous net load on any phase drops to three times the largest phase output of the CG facility based on the generator inverter nameplate output rating. When disconnected due to low load, the generator shall remain disconnected until the load rises above the required setpoint plus the generator maximum output and remains above this level continuously for 30 minutes at which time it may reconnect to the EWEB electric distribution system. For example:

3.9.d.1. The largest generator size a facility with a minimum load of 100 kW may have is 25 kW (25% of 100 kW).

3.9.d.2. When operating at this minimum load with maximum generator output, the net load of the facility is 75 kW (100 kW – 25 kW), which is three times the generator output.

3.9.d.3. If the net load drops below 75 kW to 74 kW, the generator shall be disconnected.

3.9.d.4. After the generator is disconnected, the under-power relay measuring the net load will now see 99 kW of load since the 25 kW generator is now disconnected.

3.9.d.5. The load must stay above 100 kW continuously for 30 minutes before the generator is allowed to reconnect.

3.9.e. The under-power control scheme, setpoints, all components, and functional test method shall be approved by EWEB in writing. The controls shall be functionally tested annually for the life of the CG facility and submitted to EWEB. Any changes to the control scheme or control equipment in the future shall be approved by EWEB.

4.0 PROTECTIVE RELAY REQUIREMENTS

4.1. The Customer shall be solely responsible for properly protecting and synchronizing their CG facility with the EWEB electric distribution system.

4.2. Customer facility shall include a UL approved automatic interrupting device that is rated to interrupt available short circuit current. The interrupting devices shall be tripped, as a minimum, by all protective devices identified and required herein.

4.3. In addition to the required relays for overvoltage, undervoltage, overfrequency, underfrequency, and overcurrent, all CG facilities shall be consistent with the guidelines set forth in IEEE Std. C37.102, IEEE Guide for AC Generator Protection.

4.4. See section 3.2 above for additional relays and controls required for connection to the EWEB secondary distribution network system.

5.0 METERING REQUIREMENTS

5.1. Customer shall provide and install, in accordance with EWEB Electric Utility Customer Services Policies and Procedures, meter sockets and metering cabinets in a suitable location to be determined by EWEB Electric Distribution or Electric Meter Department. All new meter bases shall be grouped with, and installed within five feet of any existing meters except as described below.

5.2. For Net Metered-Type CG , only one bi-directional electric meter is required. The same meter will be used to measure the power used by the Customer as well as any excess power delivered to EWEB.

5.3. For Generation-Type CG, a dedicated electric meter is required to measure the power delivered to EWEB, in addition to the meter(s) to measure the power used by the Customer.

5.4. For those primary metered facilities where EWEB has approved Customer Generation to be installed on the Customer premises and connected on the Customer side of the primary meter, a dedicated EWEB electric meter is required to measure the power produced by the Customer generator. This meter can be located remotely from the primary meter, but a phenolic plaque shall be installed at the primary meter

with a map showing the location(s) of the meter(s) for the Customer generator(s). If the Customer generation meter requires a CT, a disconnect switch shall be provided per the requirements in section 3 and shall be installed within 5 feet of the EWEB meter for the Customer generator.

5.5. EWEB will furnish, own, install and maintain all meters that register the sales of power to, and the purchase or transfer of power from Customer.

6.0 LABELING REQUIREMENTS

6.1. All labels shall be laminated nameplates with engraved letters with wording as described below, permanently attached to the front of the equipment enclosure in a clearly visible location.

6.2. The Disconnect Switch nameplate shall read "UTILITY DISCONNECT SWITCH FOR GENERATOR MAY BE ENERGIZED FROM BOTH LINE AND LOAD".

6.3. The Meter Base and current transformer can (if applicable) nameplate(s) shall read "NET-METERED GENERATION MAY BE ENERGIZED FROM BOTH LINE AND LOAD", or "GENERATION ONLY MAY BE ENERGIZED FROM BOTH LINE AND LOAD " as applicable.

7.0 TESTING REQUIREMENTS

7.1. Customer shall, at a minimum, have all specified interface equipment, shutdown and associated protective devices tested and calibrated at the time of installation by qualified personnel and shall also perform functional trip testing of these relays and associated generator or inverter breaker. Calibration shall include on-site bench testing of pickup and timing characteristics of the relays. Functional testing shall demonstrate that each protective relay trip function as required herein, upon a simulated out of tolerance input signal, will trip the generator breaker as designed, and shall also include a simulated loss of control power to demonstrate that the generator breaker will open.

7.2. If requested, Customer shall provide EWEB with a copy of calibration and functional test results. Customer shall also notify EWEB at least five working days in advance that such tests are to be performed and allow EWEB personnel to witness such tests. Customer shall not commence interconnected operation of its generating facility until the installation has been inspected by an authorized EWEB representative and final written approval is received from EWEB to commence interconnected operation. Customer shall give EWEB at least five working days prior to notice of when initial startup is to begin. EWEB shall have the right to have a representative present during initial energizing and testing of CG facility.

8.0 SAFETY

8.1. All safety and operating procedures for CG facilities shall be in compliance with the Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.269, the National Electrical Code (NEC), the National Electrical Safety Code (NESC), EWEB safe work practices, and equipment manufacturer's safety and operating manuals.

9.0 REFERENCE STANDARDS

A Refer to EC4-0.6500 for Overhead Customer Generation Service Reference.

B Refer to EC5-0.6500 for Underground Customer Generation Service Reference.