



**U.S. Virgin Islands Water and Power Authority**

**REQUIREMENTS AND PROCEDURES**

**FOR**

**INTERCONNECTING GENERATING FACILITIES**

**TO THE**

**ELECTRICAL DISTRIBUTION SYSTEM**

September 2019

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## **1. Definitions**

- a. Clearing Time: The time between the abnormal voltage being applied and the generating facility ceasing to energize the WAPA Distribution System.
- b. Customer: The individual or entity applying for interconnection.
- c. Customer Insurance Coverage: Consistent with Section 6, the Customer shall maintain insurance coverage or be self-insured against risks arising under the Interconnection Agreement. Proof of Customer Insurance Coverage will be included as Exhibit C to an Interconnection Agreement entered between WAPA and the Customer.
- d. Distribution System: All electrical wires, equipment, and other facilities at the distribution voltage levels owned or provided by the utility, through which WAPA provides electrical service to its customers.
- e. Facility Equipment List: Identifies equipment, space, and/or data at the Generating Facility location to be provided by the Customer for use in conjunction with WAPA's Interconnection Facilities. The Facility Equipment List will be included as Exhibit A to any Interconnection Agreement entered between WAPA and the Customer.
- f. Facility Protection Devices/Schemes: The protection and synchronizing relays and settings, and protection, synchronizing and control schemes, consistent with the technical requirements of Section 8, that affect the reliability, safety of operation, and power quality of WAPA's Distribution System with which the Generating Facility seeks to interconnect.
- g. Generating Facility: Customer or utility-owned electrical power generation or storage technology that is interconnected to the WAPA Distribution System. This is also a term synonymous with Distributed Energy Resources (DER). Battery Energy Storage Systems (BESS) will also be considered part of this category for the purposes of interconnection, even though BESS may be a load or a source of energy at different times.
- h. Initial Technical Review: Pursuant to Section 3, the review by WAPA following receipt of an Interconnection Application to determine the following: a) if the Generating Facility qualifies for Simplified Interconnection; or b) if the Generating Facility can be made to qualify for interconnection with a Supplemental Review determining additional requirements, if any.
- i. Interconnection Application: Completion of one of the two applications in Attachments 1 or 3, as appropriate, submitted to WAPA for interconnection of a Generating Facility.
- j. Interconnection Facilities: The electrical wires, switches and related equipment that are required in addition to the facilities required to provide electric distribution service to a Customer to allow interconnection. Interconnection Facilities may be located on either side of the Point of Interconnection as appropriate to their purpose and design. Interconnection Facilities may be integral to a Generating Facility or provided separately.

- k. Interconnection Requirements Study (or “IRS”): Pursuant to Section 5, a study to establish the requirements for interconnection of a Generating Facility with WAPA’s Distribution System. This may also be referred to as a Detailed Impact Study in various documents, standards and procedures.
- l. Inverter System: A machine, device, or system that changes direct-current power to alternating-current power.
- m. Islanding: Islanding is a condition in which one or more Generating Facilities deliver power to a WAPA customer or customers using a portion of WAPA’s Distribution System that is electrically isolated from the remainder of WAPA’s Distribution System. Unintended islanding may occur following an unanticipated loss of a portion of the WAPA Distribution System.
- n. Line Section: The portion of the WAPA Distribution System connected to a Customer bounded by automatic sectionalizing devices, or the end of a distribution line. Where a radial distribution circuit does not have automatic sectionalizing devices, the whole circuit is considered one Line Section. A fuse must be manually replaced and is therefore not considered an automatic sectionalizing device.
- o. Point of Interconnection: The point at which the WAPA and customer interface occurs.
- p. Short Circuit Current Contribution Ratio (SCCR): The SCCR evaluates the short circuit current contribution of the Generating Facility in two ways. First the SCCR looks at the ratio of the Generating Facility short circuit contribution to the short circuit contribution of the utility system for a three-phase fault at the high voltage side of the customer or utility transformer connecting the generating facility to the utility (aggregate SCCR must be less than or equal to 10%). Second, it compares the Generating Facility short circuit current to the interrupt rating of the customer’s service panel to ensure that the customer’s equipment will not be overloaded.
- q. Simplified Interconnection: Interconnection conforming to the Initial Technical Review requirements of Sections 3 and 4.
- r. Supplemental Review: Pursuant to Section 4, a process wherein WAPA further reviews an Interconnection Application that fails one or more of the Initial Technical Review screens. The intent of the Supplemental Review is to provide a slightly more detailed review of only the conditions that cause the Generating Facility generator to fail Initial Technical Review. Supplemental Review may result in one of the following: a) approval of interconnection; b) approval of interconnection with additional requirements; or c) cost and schedule for an Interconnection Requirements Study.
- s. Synchronous Generator: A rotating machine generator that converts mechanical power into electrical power, in which the rotor current creating the magnetic field comes from a separate DC source or the generator itself.

- t. System Protection Facilities: The equipment, including necessary protection signal communications equipment, required: (a) to protect WAPA's Distribution System from faults or other electrical disturbances occurring at the Generating Facility, and (b) to protect the Generating Facility from faults or other electrical system disturbances occurring on WAPA's Distribution System or on other delivery systems or other generating systems to which WAPA's Distribution System is directly connected, as indicated in the Interconnection Requirement Study, if any.
- u. System Upgrade Facilities: The equipment and facilities at or beyond the Point of Interconnection, excluding WAPA's Interconnection Facilities, that are necessary or advisable, if any, to be incorporated into WAPA's Distribution System for the Generating Facility to interconnect reliably and safely, and for WAPA's Distribution System to operate reliably and safely and in a manner that meets the interconnection procedures and associated standards, and in each case including any modification, addition, or upgrades to such equipment and facilities necessary for the Generating Facility to interconnect reliably and safely to WAPA's Distribution System.

## **2. Overview of the Interconnection Process**

- a. **Step 1:** WAPA's interconnection review begins when a Customer submits to WAPA a completed Interconnection Application, along with the design drawings, operating manuals, manufacturer's brochures/instruction manual and technical specifications, manufacturer's test reports, list of DER system materials, protection and synchronizing relay settings, and protection, synchronizing, and control schemes for the Generating Facility to WAPA for its review. WAPA shall have the right to specify Facility Protection Devices/Schemes for the Generating Facility. WAPA shall maintain the confidentiality of information the Customer deems confidential, unless and until a final, non-appealable Commission decision determines that disclosure is necessary to protect the public or as otherwise determined by the Commission. For DER developers and Customers who anticipate the need for a full detailed impact study (see Step 5 under IRS), checking the box on the application for IRS will expedite the application review once the application is deemed complete by WAPA. Interconnection forms are available upon request and on the WAPA DER online portal ([www.viwapa.vi](http://www.viwapa.vi)). Applications vary depending on DER system size and type of generation technology.
- b. **Step 2:** Within ten (10) business days of WAPA's receipt of an Interconnection Application and supporting material, or such other period as is mutually agreed upon in writing by WAPA and the Customer, WAPA shall review the Customer's Interconnection Application and supporting material and provide written notification of its general completeness, or alternatively, incompleteness. If an Interconnection Application is deemed incomplete, WAPA shall specify in a written notice the additional information that is required. The completeness determination cycle will be repeated as necessary until sufficient information is submitted by the Customer to enable WAPA to review the Interconnection Application. The timeline for Step 2 is reset if an application is deemed incomplete.

- c. **Step 3:** Within fifteen (15) business days of the date the Customer's Interconnection Application and supporting materials are deemed complete, WAPA will complete an Initial Technical Review of the Interconnection Application. The Initial Technical Review will result in WAPA providing either: (a) if all the Initial Technical Review Screens are passed (see Figure 1), an executable Interconnection Agreement for the Customer's signature; or, (b) if one or more screens are not passed, notification that Supplemental Review will be required and the results, in writing, of all appropriate Initial Technical Review screens. Notification to Customer will include an estimated cost to perform the Supplemental Review.
- d. **Step 4:** If Supplemental Review is required, within fifteen (15) business days of notification by WAPA, the Customer shall notify WAPA, in writing, to proceed with the Supplemental Review, or the Customer shall agree to withdraw its Interconnection Application.
- e. **Step 5:** Within twenty (20) business days of notification by the Customer that it would like to move forward with Supplemental Review, WAPA shall complete the Supplemental Review. The Supplemental Review will result in WAPA providing either: (a) Simplified Interconnection (b) interconnection requirements beyond those for a Simplified Interconnection, and a non-binding, good faith estimate of WAPA's portion of the costs to perform the interconnection upgrades identified by the Supplemental Review (if any), or (c) a determination that an Interconnection Requirements Study (IRS) is required, and a good faith cost estimate and schedule for the completion of the IRS, including an identification of the specific analyses and/or reviews that will be performed as part of the IRS.
- f. **Step 6:** If an IRS is required, within thirty (30) business days of notification by WAPA, the Customer shall agree to pay the cost estimate for the IRS, or the Customer shall withdraw its Interconnection Application by notifying WAPA in writing. WAPA shall complete the IRS within six months of the Customer's agreement to move forward with the IRS and payment of the IRS cost is received.
- g. **Step 7:** Based on the results of the Initial Technical Review, or Supplemental Review (if needed), or IRS (if needed), the Customer and WAPA will work together to modify and finalize the single-line diagram, list of necessary relay functions and circuit breaker requirements, trip scheme and settings, and three-line diagram, which may be required in the circumstances set forth in the Interconnection Application. After finalization of the single-line diagram, relay list, trip scheme and settings, and three-line diagram (if required), the Customer will make any revisions deemed necessary to the Interconnection Application and resubmit the Interconnection Application to WAPA. Resubmission will not impact the Customer's interconnection queue position unless agreed upon by both Customer and WAPA. The Customer must also complete a Facility Equipment List, which will identify equipment, space and/or data at the Generating Facility location that must be provided by the Customer for use in conjunction with WAPA's Interconnection Facilities. The Facility Equipment List will be included as Exhibit A to an Interconnection Agreement

entered between WAPA and the Customer. If requested, WAPA will provide assistance to the Customer to complete the Facility Equipment List.

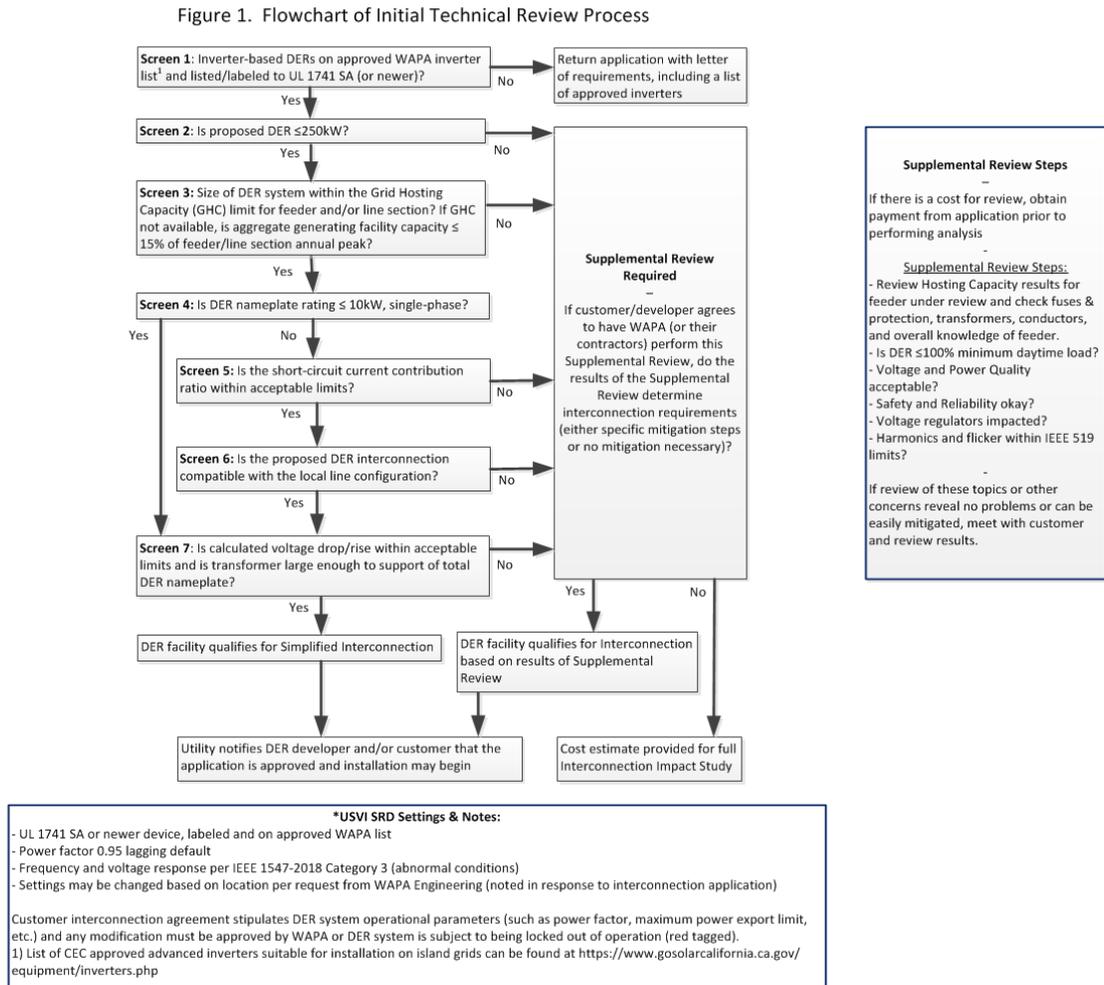
- h. **Step 8:** Within fifteen (15) business days of the completion of all activities specified in Step 7 above, or within such other period as is mutually agreed upon in writing by WAPA and the Customer, WAPA will complete an identification of Interconnection Facilities that are necessary to complete the interconnection and that will be owned by WAPA. A list and description of WAPA's Interconnection Facilities will be included as Exhibit B to the Interconnection Agreement entered between WAPA and the Customer. WAPA and Customer shall mutually agree in writing to a schedule by which the Interconnection Facilities will be constructed and a determination of when the Customer's Generating Facility shall be connected to WAPA's Distribution System. The Interconnection Facilities are project-specific, and the time to complete the facilities will depend on the complexity of the facilities required. Consistent with Section 6, the Customer shall maintain insurance coverage or be self-insured against risks arising under the Interconnection Agreement. The Customer Insurance Coverage will be included as Exhibit C to any Interconnection Agreement entered between WAPA and the Customer.
- i. **Step 9:** Within five (5) business days of the completion of all activities specified in the steps above, WAPA will provide the Customer with an executable Interconnection Agreement, which must be executed prior to the interconnection and parallel operation of the Customer's Generating Facility. If requested by the Customer, the Interconnection Agreement may be signed by the Customer and a third party that is the owner and/or operator of the Generating Facility.
- j. WAPA, for good cause, may modify the time limits to conduct the Initial Technical Review, Supplemental Review, or IRS, and shall inform the Customer in writing of the need to modify the applicable time limit. The modified time limit shall be mutually agreed upon in writing between WAPA and the Customer. Final results of all technical screenings, Supplemental Review, and IRS studies will be provided in writing to the Customer.

### **3. Initial Technical Review**

- a. The Initial Technical Review process includes a screening (application of technical screens shown in Figure 1) to determine if a Generating Facility qualifies for Simplified Interconnection, or if Supplemental Review is needed to determine requirements, if any, beyond those of a Simplified Interconnection. Failure to pass an Initial Technical Review screen means only that further review is required to determine additional requirements, if any, or if an IRS is needed before the Generating Facility can be approved for interconnection with WAPA's Distribution System.
- b. Within fifteen (15) business days of the date the Customer's Interconnection Application is deemed complete, WAPA will complete the Initial Technical Review. WAPA, for good cause, may modify the time limit to conduct the Initial Technical Review and shall inform the Customer in writing of the need to modify the applicable time limit. The modified time limit shall be mutually agreed upon in writing between WAPA and the Customer.

- c. The Initial Technical Review will result in WAPA providing either: (a) an executable interconnection agreement for the Customer’s signature if all of the Initial Technical Review Screens are passed; or, (b) if one or more screens are not passed, notification that Supplemental Review will be required and the results, in writing, of all Initial Technical Review screenings.

Figure 1. Flowchart of Initial Technical Review Process



d. Initial Technical Review Screens:

**Screen 1:** Inverter-based DERs on approved WAPA inverter list and listed/labeled to UL 1741SA (or newer)?

*If Yes*, continue to Screen 2

*If No*, continue to Supplemental Review

**Significance:** Application must include model number(s) of inverters that are on the WAPA approved inverter list available on the WAPA website. Being listed under UL 1741SA (or newer) will ensure that the grid support features for island systems are available, including abnormal voltage response and abnormal frequency response settings, among others. These latest generation “smart inverters” offer new and important grid support critical to island electrical systems. Newer versions of UL 1741 will also include key functions for island support.

**Screen 2:** Is the Generating Facility inverter-based and less than or equal to 250 kW (AC) and does it meet IEEE 1547 and UL 1741SA (or newer) standards?

*If Yes*, continue to Screen 3.

*If No*, continue to Supplemental Review.

**Significance:** Inverter-based generating facilities less than 250 kW (AC) interconnecting through inverters that meet UL 1741SA, or latest version (the Standard for Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources) and IEEE 1547, or latest version (the IEEE Standard for Interconnecting Distribution Resources with Electric Power Systems) have minimal impact to the short circuit currents. Self-excited Synchronous Generators present additional interconnection challenges.

**Screen 3:** Is the proposed DER system within the Grid Hosting Capacity (GHC) limit for feeder and/or line section? If GHC not available, is aggregate generating facility capacity less than or equal to 15% of feeder or line section annual peak?

*If Yes*, continue to Screen 4.

*If No*, continue to Supplemental Review.

**Significance:** The Grid Hosting Capacity calculations are a complex set of modeling results that have determined the maximum size of DER at that location that may be installed with minimal risk of the DER(s) causing a problem for the distribution system. An alternate, and generally very conservative estimate when GHC is not available, is to calculate 15% of the annual peak demand at that location and compare all DER tied to that location is lower than the 15%.

**Screen 4:** Is the DER nameplate rating less than or equal to 12 kW (AC), single-phase?

*If Yes*, Continue to Screen 7.

*If No*, continue to Screen 5.

Significance: The Generating Facility will have a minimal impact on fault current levels and any potential line over-voltages from loss of WAPA's Distribution System neutral grounding.

**Screen 5:** Is the Short Circuit Current Contribution Ratio within acceptable limits?

*If Yes*, continue to Screen 6.

*If No*, perform Supplemental Review.

The Short Circuit Current Contribution Ratio consists of two criteria; both of which must be met when applicable:

- 1) When measured at primary side (high side) of a Dedicated Distribution Transformer serving a Generating Facility, the sum of the short circuit contribution ratios of all generating facilities connected to WAPA's Distribution System circuit that serves the Generating Facility must be less than or equal to 0.1 (10%), *and*
- 2) When measured at the secondary side (low side) of a shared distribution transformer, the short circuit contribution of the proposed Generating Facility must be less than or equal to 2.5% of the interrupting rating of the Customer's service equipment.

Significance: If the Generating Facility passes this screen it can be expected that it will have no significant impact on WAPA's Distribution System's short circuit duty, fault detection sensitivity, relay coordination or fuse-saving schemes.

Note: The ampere rating of the Customer's service equipment to be used in this evaluation will be that rating for which the customer's utility service was originally sized or for which an upgrade has been approved. It is not the intent of this provision to allow increased export simply by increasing the size of the Customer's service panel, without separate approval for the resize.

**Screen 6:** Is the proposed DER interconnection compatible with the local line configuration?

*If Yes*, continue to Screen 7.

*If No*, perform Supplemental Review.

Line Configuration Screen: Identify primary distribution line configuration that will serve the Generating Facility. Based on the type of interconnection to be used for the Generating Facility, determine from the table below if the proposed Generating Facility passes the screen.

**Screen 7:** Is the calculated voltage drop/rise within acceptable limits and is transformer large enough to support the total DER nameplate(s)?

*If Yes*, application qualifies for Simplified Interconnection.

*If No*, continue to Supplemental Review.

**Significance:** Any voltage flicker at the Point of Interconnection caused by the generating facility shall not exceed the limits defined by the “Borderline of Visibility Curve” identified in IEEE Standard 1453-2004 “Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems” (or latest version). This requirement is necessary to minimize the adverse voltage effects upon other utility customers on the WAPA Distribution System. Also included in this screen is the transformer size check to be sure the total DER tied to the transformer(s) will not overload the transformer.

Table I

Primary Distribution Line Type Configuration	Type of Interconnection to be Made to Primary Distribution Line	Results/Criteria
Three-phase, three wire	Any type	Pass Screen
Three-phase, four wire	Single-phase, line-to-neutral	Pass Screen
Three-phase, four wire (For any line that has such a section OR mixed three wire and four wire)	All others	To pass, aggregate Generating Facility nameplate rating must be less than or equal to 10% of Line Section peak load

**Significance:** If the primary distribution line serving the Generating Facility is of a “three-wire” configuration, or if the Generating Facility’s distribution transformer is single-phase and connected in a line-to-neutral configuration, then there is no concern about overvoltages to WAPA’s or other customer’s equipment caused by loss of system neutral grounding during the operating time of the non-Islanding protective function.

#### **4. Supplemental Review**

- a. If a Generating Facility has failed one or more Initial Technical Review screens, WAPA will notify the Customer and offer to perform a Supplemental Review. The intent of Supplemental Review is to provide a slightly more detailed review of only the conditions that caused the Generating Facility to fail the Initial Technical Review.
- b. If Supplemental Review is required, the Customer shall notify WAPA, in writing, to proceed with the Supplemental Review, or the Customer shall agree to withdraw the Interconnection Application. If the Customer does not notify WAPA within fifteen (15) business days, the Interconnection Application shall be deemed to be withdrawn.
- c. The Supplemental Review shall be completed, absent any extraordinary circumstances, within twenty (20) business days of receipt of the Customer’s authorization, in writing, to

proceed with the Supplemental Review. WAPA, for good cause, may modify the time limit to conduct the Supplemental Review and shall inform the Customer, in writing, of the need to modify the applicable time limit. The modified time limit shall be mutually agreed upon, in writing, between WAPA and the Customer.

- d. The Supplemental Review will result in WAPA providing either: (a) Simplified Interconnection, (b) interconnection requirements beyond those for a Simplified Interconnection, and a non-binding, good faith estimate WAPA's portion of the costs to perform the interconnection upgrades identified by the Supplemental Review, or (c) a determination that an IRS is required, and a good faith cost estimate and schedule for the completion of the IRS including an identification of the specific analysis and/or reviews that will be performed as part of the IRS.
- e. An IRS will not be required when: (1) Supplemental Review is triggered by Screen 3 and the aggregate generating capacity per distribution feeder is below 50% of the feeder minimum kW load during the period when the proposed generation is available (e.g. noon on Sunday for solar photovoltaic systems); or (2) Supplemental Review is triggered by Screen 6 (line configuration) and a feasible solution to effectively ground the Generating Facility has been agreed upon between WAPA and the Customer.
- e. If Supplemental Review results in interconnection requirements beyond those for a Simplified Interconnection, the Customer must complete a Facility Equipment List, which will identify equipment, space and/or data at the Generating Facility location to be provided by the Customer for use in conjunction with WAPA's Interconnection Facilities. The Facility Equipment List will be included as Exhibit A to an Interconnection Agreement entered between WAPA and the Customer. If requested, WAPA will provide assistance to the Customer to complete the Facility Equipment List.

## **5. Interconnection Requirements Study**

- a. If an IRS is required, WAPA will provide the Customer a good faith cost estimate and schedule for the completion of the IRS, including an identification of specific analyses and/or reviews that will be performed. A cost estimate and schedule for the IRS will be provided to the Customer before the IRS is started.
- b. The IRS will assess whether Interconnection Facilities and System Upgrade Facilities, if any, are needed for the Generating Facility to interconnect reliably and safely to WAPA's Distribution System, and for the Generating Facility and the WAPA's Distribution System to be operated in parallel in a reliable and safe manner. The IRS, among other things, will: (i) identify probable impacts of the requested interconnection on the operation, reliability and safety of WAPA's Distribution System; (ii) assess whether the requested interconnection will require System Upgrade Facilities or System Protection Facilities; (iii) determine the location and configuration of Interconnection Facilities, System Upgrade Facilities and System Protection Facilities; (iv) assess costs of design, engineering, procurement, and construction of such facilities; (v) identify a schedule for constructing, testing, and completing such facilities consistent with the commencement of operation of

the Generating Facility; and (vi) designate the WAPA operations center that will coordinate the operations of the Generating Facility.

- c. The IRS may include, but not limited to, the following: (i) Power-Flow Study; (ii) Short-Circuit Study; (iii) Circuit Protection and Coordination Study; (iv) Impact on System Operation; (v) Stability Study, and the conditions that would justify including this element in the Impact Study; (vi) Voltage-Collapse Study, and the conditions that would justify including this element in the Impact Study; (vii) A review of the Generating Facility's protective devices for adherence to the Interconnection Standards.
- d. During the course of the IRS, the Customer and WAPA shall exchange information regarding the design and compatibility of the Interconnection Facilities and System Upgrade Facilities and compatibility of the Interconnection Facilities with WAPA's Distribution System, and shall work diligently and in good faith to make any design changes reasonably necessary to achieve such compatibility. The Customer and WAPA shall meet periodically during such study to discuss alternative interconnection options, to exchange information that would be reasonably expected to impact such interconnection options, to analyze such information, and to determine the potential feasible points of interconnection.
- e. The IRS, and all data, analyses, and reports collected as part of or in connection with either such interconnection study, all work papers generated as part of either study, and all iterations of the preliminary and final studies (including periodic updates and drafts by WAPA) shall be the property of WAPA. The Customer shall be responsible for payment of all reasonable costs and expenses, including charges and fees of consultants, incurred by WAPA for the IRS. The Customer shall pay all such amounts not later than thirty (30) calendar days after invoice from WAPA.
- f. The Customer shall notify WAPA not less than fifteen (15) Business Days prior to the anticipated start-up date of Generating Facility. Such notification shall be accompanied by an Interconnection Completion Certificate, which is Attachment 2 to these interconnection procedures. Upon receipt of such notice and certificate, WAPA may contact the Customer to schedule an inspection of the Generating Facility at WAPA's expense. Any inspection shall be scheduled to occur, at a time mutually agreeable to WAPA and the Customer, within ten (10) Business Days of Customer's notice of the anticipated start-up date and Interconnection Completion Certificate. A Generating Facility shall not pass WAPA's inspection unless such Generating Facility fully complies with the technical standards in Section 8. If a Generating Facility initially fails a WAPA inspection, WAPA shall offer to redo the inspection at Customer's expense at a time mutually agreeable to WAPA and the Customer.
- g. After WAPA has received Customer's Interconnection Completion Certificate and the Generating Facility has passed WAPA's inspection, or WAPA has waived t, in writing, he right to inspect the Generating Facility, Customer may begin parallel operation of the Generating Facility with WAPA's Distribution System. Customer and WAPA shall enter into an Interconnection Agreement, substantially in the form of Attachment 6.

- h. WAPA shall complete or have a consultant complete the IRS within one hundred fifty (150) calendar days of the Customer's payment of the IRS. WAPA, for good cause, may modify the time limit to conduct the IRS and shall inform the Customer, in writing, of the need to modify the applicable time limit. The modified time limit shall be mutually agreed upon in writing between WAPA and the Customer. WAPA shall provide a written letter to the Customer to explain all delays in completing the IRS beyond the completion schedule of one hundred fifty (150) calendar days.
- i. WAPA may consolidate more than one Generating Facility in an IRS if the Generating Facilities are on the same Distribution System feeder that is the subject of the IRS, provided that the Customers consent to consolidation and the sharing of technical information between them. Parties to a consolidated IRS shall pay study and upgrade costs on a pro rata basis as agreed by the parties that desire to share the costs for the IRS. The cost may be prorated based upon the expected annual electricity output of the respective facilities or the capacity of the Generating Facility.
- j. The IRS may identify the need for Interconnection Facilities required to facilitate interconnection of the Generating Facility. The Customer will be responsible for the cost of any Interconnection Facilities associated with the interconnection of its Generating Facility. An identification of WAPA Interconnection Facilities and an estimated cost of WAPA Interconnection Facilities shall be listed in Exhibit B (Interconnection Facilities Owned by WAPA) to the Interconnection Agreement entered between WAPA and the Customer. The Customer will be responsible for the cost of any Interconnection Facilities associated with the interconnection of its Generating Facility.

## **6. Insurance Coverage**

- a. Customer is obligated to carry adequate insurance in forms and amounts that are commercially reasonable for each particular situation. Customer bears responsibility for determining its insurance requirements. Prior to execution of an Interconnection Agreement, Customer shall disclose if it will be self-insured (and if so its means and capability to self-insure) or if it will obtain an insurance policy (and if so in what forms and amounts). Customer shall provide evidence of such insurance, including insurer's acknowledgement that coverage applies with respect to the Interconnection Agreement, by providing certificates of insurance to WAPA prior to any parallel interconnection, or, if insurance is being modified, within 30 days of any change.
- b. As general guidance, WAPA recommends consideration of a commercial general liability policy, covering bodily injury and property damage. WAPA also recommends that coverage amounts be considered relative to the nameplate rating of the generator, with higher amounts of coverage for larger generators. Additionally, WAPA recommends consideration of the following insurance provisions: (1) naming WAPA, its directors, officers, agents, and employees as additional insureds; (2) inclusion of contractual liability coverage for written contracts and agreements including the standard interconnection agreement; (3) inclusion of provisions stating that the insurance will respond to claims or suits by additional insureds against Customer or any other insured thereunder; and (4) inclusion of provisions that insurance is primary with respect to Customer and WAPA.

The adequacy of the coverage afforded by the insurance should be reviewed by Customer from time to time, and if it appears in such review that risk exposures require an increase in the coverages and/or limits of this insurance, Customer should make such increase to that extent.

## **7. Dispute Resolution**

- a. If there is a dispute between Customer and WAPA as to whether an IRS is required, or as to the scope and cost of the study, then WAPA shall use the following procedures: (1) WAPA shall inform Customer in writing of the reasons for and scope of the study required; (2) if Customer disagrees with the conclusion, then Customer may request to meet with representatives from WAPA to discuss the matter; (3) if Customer continues to disagree with the conclusion, then Customer may write to WAPA explaining the position of Customer, and WAPA shall respond in writing within fifteen (15) business days (so that any dispute is reduced to writing); (4) if the parties continue to have a dispute, then authorized representatives from WAPA and Customer (having full authority to settle the dispute) shall meet in person, or by telephone conference, or other electronic media, with the meeting to be scheduled within five (5) business days of the request, and for at least one hour, or less than one hour at the option of the party requesting the meeting, and attempt in good faith to resolve the dispute; provided that if the dispute involves technical issues persons with sufficient technical expertise and familiarity with the issue in dispute from each party shall also attend the meeting; and (5) if the parties continue to have a dispute, then the parties may engage in a form of alternative dispute resolution agreeable to both parties, or a party may request that the Commission resolve the matter by input relevant dispute resolution process.
  
- b. If there is a dispute as to the need for interconnection equipment, protective devices or control systems, then WAPA shall use the following procedures: (1) WAPA shall inform Customer of the reasons for the interconnection equipment/protective devices/control systems; (2) if Customer disagrees with the conclusion, then Customer may request to meet with representatives from WAPA to discuss the matter; (3) additional analyses may be conducted by WAPA at the request of a Customer that questions the need for particular interconnection equipment/protective devices/control systems if Customer pays for the analyses; (4) if Customer continues to disagree with the conclusion, then Customer may write to WAPA explaining the position of Customer, and WAPA shall respond in writing within fifteen (15) business days (so that any dispute is reduced to writing); (5) if the parties continue to have a dispute, then authorized representatives from WAPA and Customer (having full authority to settle the dispute), shall meet in person, or by telephone conference, or other electronic media, with the meeting to be scheduled within five (5) business days of the request, and for at least one hour, or less than one hour at the option of the party requesting the meeting, and attempt in good faith to resolve the dispute; provided that if the dispute involves technical issues, persons with sufficient technical expertise and familiarity with the issue in dispute from each party shall also attend the meeting; and (6) if the parties continue to have a dispute, then the parties may engage in a form of alternative dispute resolution agreeable to both parties, or a party may request that the Commission resolve the matter.

## **8. Technical Standards**

- a. Technical Standards. Each Generating Facility shall comply with all applicable codes and standards, applicable laws, and good engineering and operating practices, and with the following standards, as applicable:
  - i. IEEE Standard 1547-2018 for Interconnecting Distributed Resources with Electric Power Systems for facilities tied to distribution facilities (up to 25 kV).
  - ii. IEEE Standard 1547.1 for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems. The latest version should be harmonized with the latest IEEE 1547 (2018).
  - iii. UL 1741 SA Standard for Inverters, Converters and Controllers for Use in Independent Power Systems (or latest version with smart inverter functionality). UL 1741 SA compliance must be recognized or certified by a Nationally Recognized Testing Laboratory as designated by the U.S. Occupational Safety and Health Administration. Certification of a particular model or a specific piece of equipment is sufficient. It is also sufficient for an inverter built into a Facility to be recognized as being UL 1741 SA compliant by a Nationally Recognized Testing Laboratory.
  - iv. NFPA 70 National Electrical Code (latest edition).
  - v. ANSI C84.1-2016, American National Standard for Electric Power Systems and Equipment—Voltage Ratings (60 Hertz) (latest edition).
  - vi. IEEE 1453-2004 IEEE Recommended Practice for Measurement and Limits of Voltage Fluctuations and Associated Light Flicker on AC Power Systems (latest edition).
  - vii. PV modules and panels must be listed and be in compliance with Underwriters Laboratories (UL) Standard 1703, Standard for Safety: Flat-Plate Photovoltaic Modules and Panels.
- b. Additional Standards and Requirements. In addition, each Generating Facility must comply with the following standards and requirements:
  - i. Permits and Approvals. Customer is responsible for obtaining any necessary local code official approval (electrical, building, zoning, etc.), as well as all other permits and approvals, for the Generating Facility and Customer's Interconnection Facilities.
  - ii. Commissioning Test. Customer shall conduct commissioning tests of the Generating Facility and Customer's Interconnection Facilities pursuant to IEEE Standard 1547-2018 and in compliance with all manufacturer requirements.

- iii. Operations and Maintenance. Customer shall be fully responsible to operate, maintain, and repair the Generating Facility to ensure that it complies at all times with IEEE Standard 1547-2018.
- iv. Periodic Testing. WAPA may require any manufacturer-recommended testing and all interconnection-related protective functions and associated batteries shall be periodically tested at intervals specified by the manufacturer or WAPA. Periodic test reports or a log for inspection shall be maintained.
- v. External Disconnect Switch. If indicated by the IRS, WAPA may require a manual, lockable, load break utility-interface disconnect switch between the output of the photovoltaic inverter and Customer's wiring connected to WAPA's Distribution System. The load break device shall be both visible and accessible to WAPA's employees. Customer hereby grants a full license to access the property and the PV system to ensure compliance herewith. Customers installing Inverter Systems that are UL 1741 SA certified and are less than 12 kW in capacity will no longer be required to include an external disconnect switch when the facility has a self-contained electric revenue meter (i.e., 0-320 amp socket based on meters or 400 amp K-based meters).
- vi. Disconnection. WAPA may temporarily disconnect the Generating Facility (i) for transmission events, unscheduled outages, or electric system emergencies, or (ii) if the Generating Facility does not operate in the manner consistent with these terms and conditions of the Interconnection Agreement and these interconnection procedures. WAPA shall inform the Customer in advance of any scheduled disconnection, or as is reasonable after an unscheduled disconnection.
- vii. Testing of Protective Relays. WAPA reserves the right to test the anti-Islanding features and the power output quality of inverters.
- viii. Inspection. WAPA shall have the right to inspect any Generating Facility before and after interconnection approval is granted, at reasonable hours and with reasonable prior notice provided to Customer. If WAPA discovers a Generating Facility is not in compliance with the requirements of these interconnection procedures, and the non-compliance adversely affects the safety or reliability of the electric system, WAPA may require disconnection of such Generating Facility until the Generating Facility complies with these interconnection procedures.
- ix. System Equipment Protection. It is the responsibility of the Customer to protect its generating equipment, inverters, protection devices, and other system components from damage by the normal conditions and operations that occur on the part of WAPA in delivering and restoring power to WAPA's Distribution System. WAPA disclaims any liability whatsoever for damage to Customer's equipment.
- x. Costs and Expenses. Except as otherwise expressly set forth in these interconnection procedures, or the Interconnection Agreement, Customer is responsible for all costs for the design, development, permitting, engineering,

procurement, construction, completion, installation, and testing related to the Interconnection Facilities, including WAPA's Interconnection Facilities and any System Upgrade Facilities.

**ATTACHMENT 1**  
**APPLICATION FOR INTERCONNECTING A CERTIFIED, INVERTER-BASED, SMALL GENERATING FACILITY NO LARGER THAN 12 KW**

This Application is considered complete when it provides all applicable and correct information required below. Additional information to evaluate the Application may be required.

Interconnection Customer:

Name: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Telephone (Day): \_\_\_\_\_ (Evening): \_\_\_\_\_  
Fax: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_  
WAPA Account No.:

Contact (if different from Interconnection Customer):

Name: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Telephone (Day): \_\_\_\_\_ (Evening): \_\_\_\_\_  
Fax: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

Owner of the Generating Facility (if different from Interconnection Customer)

Name: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Telephone (Day): \_\_\_\_\_ (Evening): \_\_\_\_\_  
Fax: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

Generating Facility Information

Inverter Manufacturer(s): \_\_\_\_\_ Model(s) \_\_\_\_\_

Nameplate Rating: \_\_\_\_\_ (kW) \_\_\_\_\_ (kVA) \_\_\_\_\_ (AC Volts) (CEC-CSI)<sup>1</sup>

Single Phase \_\_\_\_\_ Three Phase \_\_\_\_\_

12 kW or smaller

System Design Capacity: \_\_\_\_\_ (kW) \_\_\_\_\_ (kVA) \_\_\_\_\_ (AC Volts) (CEC-CSI)

Prime Mover: Photovoltaic  Reciprocating Engine  Fuel Cell

Turbine  Other \_\_\_\_\_

Energy Source: Solar  Wind  Hydro  Diesel  Natural Gas  Battery

Fuel Oil  Other (describe) \_\_\_\_\_

Is the equipment UL1741 SA Listed? Yes \_\_\_ No \_\_\_

If Yes, attach manufacturer's cut-sheet showing UL1741 SA listing

Is the system self-excited with the potential to island (i.e. will the equipment package include an onsite storage system)? Yes \_\_\_\_\_ No \_\_\_\_\_

Estimated Installation Date: \_\_\_\_\_ Estimated In-Service Date: \_\_\_\_\_

This Application is available only for inverter-based Generating Facilities no larger than 12 kW that meet the codes, standards, and certification requirements of NEC, UL, IEEE, relevant building codes, and WAPA's interconnection requirements in effect at the time of signing this application.

List components of the Small Generating Facility equipment package that are currently certified:

Equipment Type	Certifying Entity (e.g. CEC-CSI)
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____

Interconnection Customer Signature

I hereby certify that, to the best of my knowledge, the information provided in this Application is true. I agree to return the Interconnection Completion Certificate when the Generating Facility has been installed.

Signed: \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_

Contingent Approval to Interconnect the Generating Facility

*(For WAPA use only)*

Interconnection of the Generating Facility is approved contingent upon the execution of an interconnection agreement and the return of the Interconnection Completion Certificate.

WAPA Signature: \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_

Application ID number: \_\_\_\_\_

WAPA waives inspection/witness test? Yes \_\_\_ No \_\_\_

\_\_\_\_\_

<sup>1</sup> CEC-CSI means the California Energy Commission's ratings under the California Solar Initiative program.

## ATTACHMENT 2

### INTERCONNECTION COMPLETION CERTIFICATE

Is the Generating Facility owner-installed? Yes \_\_\_\_\_ No \_\_\_\_\_

Interconnection Customer: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Address: \_\_\_\_\_

Location of the Generating Facility (if different from above):  
\_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Telephone (Day): \_\_\_\_\_ (Evening): \_\_\_\_\_

Fax: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

WAPA and Account No.: \_\_\_\_\_

Electrician:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Telephone (Day): \_\_\_\_\_ (Evening): \_\_\_\_\_

Fax: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

License number: \_\_\_\_\_

Date Approval to Install Facility granted by WAPA: \_\_\_\_\_

Application ID number: \_\_\_\_\_

Inspection:

The Generating Facility has been installed and inspected in compliance with the local

building/electrical code of \_\_\_\_\_

Signed (Local electrical wiring inspector, or attach signed electrical inspection):  
\_\_\_\_\_

Print Name: \_\_\_\_\_

Date: \_\_\_\_\_

As a condition of interconnection, you are required to send/fax a copy of this form along with a copy of the signed electrical permit to (insert WAPA information below):

Name: \_\_\_\_\_

WAPA: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

City, State ZIP: \_\_\_\_\_

Fax: \_\_\_\_\_

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Approval to Energize the Generating Facility (For WAPA use only)

Energizing the Generating Facility is approved contingent upon the execution of an appropriate interconnection agreement, which shall be provided by WAPA.

WAPA Signature: \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_

### ATTACHMENT 3

## INTERCONNECTION APPLICATION FOR ALL BUT INVERTER BASED SYSTEMS LESS THAN 12 KW

In addition to the information provided below, a complete Interconnection Application includes: 1) a single-line diagram, 2) relay list, trip scheme and settings of the Generating Facility, 3) Generating Facility Equipment List, and 4) three-line diagram (if needed), which identify the circuit breakers, relays, switches, synchronizing equipment, monitoring equipment, and control and protective devices and schemes, shall, after having obtained prior consent from WAPA, be attached to and made a part of the interconnection agreement that is signed between the Customer and WAPA at the end of the interconnection process.

The single-line diagram shall include pertinent information regarding operation, protection, synchronizing, control, monitoring and alarm requirements. The single-line diagram and three-line diagram shall expressly identify the Point of Interconnection of the Generating Facility to WAPA's Distribution System. The relay list, trip scheme and settings shall include all protection, synchronizing and auxiliary relays that are required to operate the Generating Facility in a safe and reliable manner. The three-line diagram shall show potential transformer and current transformer ratios, and details of the Generating Facility's configuration, including relays, meters, and test switches.

### Section 1, Customer Information

Customer

Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Telephone (Daytime):  
Area Code \_\_\_\_\_ Number \_\_\_\_\_ (Evening) Area Code \_\_\_\_\_ Number \_\_\_\_\_

E-mail: \_\_\_\_\_ Account Number: \_\_\_\_\_

Facility Location (if different from above): \_\_\_\_\_

Facility Location Tax Map Key number: \_\_\_\_\_

Owner (if different from Customer)

Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

E-mail: \_\_\_\_\_

Telephone (Daytime): Area Code \_\_\_\_\_ Number \_\_\_\_\_ (Evening) Area Code \_\_\_\_\_ Number \_\_\_\_\_

Operator (if different from Customer)

Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

E-mail: \_\_\_\_\_

Telephone (Daytime): Area Code \_\_\_\_\_ Number \_\_\_\_\_ (Evening) Area Code \_\_\_\_\_ Number \_\_\_\_\_

**Section 2, Generator Qualifications**

Is Generator powered from a Nonfossil Fuel Source?  Yes  No  
Type of Generator or Nonfossil Fuel Source (if applicable):  Solar  Wind  Hydro  
 Biomass  Geothermal

Other generator energy source:  Diesel  Other Fuel Oil  Other:

Battery   
PV Array DC Rated Output: \_\_\_\_\_ kW  
PV Array AC Rated Output: \_\_\_\_\_ kW  
(California Solar Initiative)

Maximum Site Load without Generation: \_\_\_\_\_ kW      Maximum Generator Capability: \_\_\_\_\_ kW

Minimum Site Load without Generation: \_\_\_\_\_ kW      Maximum Export: \_\_\_\_\_ kW

**Section 3, Generator Technical Information**

Type of Generator:  Synchronous  Induction  Inverter-Based Generating Facility

Generator (or solar collector) Manufacturer, Model Name & Number: \_\_\_\_\_  
(A copy of Generator Nameplate and Manufacturer's Specification Sheet may be substituted)

Operating Power Factor: \_\_\_\_\_      Nameplate Rating in kW: \_\_\_\_\_

Inverter Manufacturer, Model Name & Number (if used): \_\_\_\_\_  
(A copy of Inverter Nameplate and Manufacturer's Specification Sheet may be substituted)

Operating Power Factor: \_\_\_\_\_      Rating in kW: \_\_\_\_\_

Number of Starts Per Day: \_\_\_\_\_      Maximum Starting kVA: \_\_\_\_\_

UF Trip Setting: \_\_\_\_\_      UF Time Delay (Secs) \_\_\_\_\_

Generator Grounding Method:

Effectively Grounded       Resonant Grounded  
 Low-Inductance Grounded       High-Resistance Grounded  
 Low-Resistance Grounded       Ungrounded

Generator Characteristic Data (for rotating machines):  
(Not needed if Generator Nameplate and Manufacturer's Specification Sheet are provided)

Direct Axis Synchronous Reactance,  $X_d$ : \_\_\_\_\_ P.U.      Negative Sequence Reactance: \_\_\_\_\_ P.U.  
Direct Axis Transient Reactance,  $X'_d$ : \_\_\_\_\_ P.U.      Zero Sequence Reactance: \_\_\_\_\_ P.U.  
Direct Axis Subtransient Reactance,  $X''_d$ : \_\_\_\_\_ P.U.      KVA Base: \_\_\_\_\_  
Inertia Constant, H: \_\_\_\_\_ P.U.  
Excitation Response Ratio: \_\_\_\_\_  
Direct Axis Open-Circuit Transient Time Constant,  $T'_{do}$ : \_\_\_\_\_ Seconds  
Direct Axis Open-Circuit Subtransient Time Constant,  $T''_{do}$ : \_\_\_\_\_ Seconds

Fault Current Contribution of Generator: \_\_\_\_\_ Amps

#### **Section 4, Interconnecting Equipment Technical Data**

Will an interposing transformer be used between the generator and the Point of Interconnection?  Yes  No

Transformer Data (if applicable, for Customer Owned Transformer):  
(A copy of transformer Nameplate and Manufacturer's Test Report may be substituted)

Size: \_\_\_\_\_ KVA. Transformer Primary: \_\_\_\_\_ Volts  Delta  Wye  Wye Grounded  
Transformer Secondary: \_\_\_\_\_ Volts  Delta  Wye  Wye Grounded  
Transformer Impedance: \_\_\_\_\_ % on \_\_\_\_\_ KVA Base

Transformer Fuse Data (if applicable, for Customer Owned Fuse):  
(Attach copy of fuse manufacturer's Minimum Melt & Total Clearing Time-Current Curves)

At  Primary Voltage  Secondary Voltage  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Size: \_\_\_\_\_ Speed: \_\_\_\_\_

Transformer Protection (if not fuse):

Please describe: \_\_\_\_\_

Interconnecting Circuit Breaker (if applicable):  
(A copy of circuit breaker's Nameplate and Specification Sheet may be substituted)

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_  
Continuous Load Rating: \_\_\_\_\_ (Amps)      Interrupting Rating: \_\_\_\_\_ (Amps)      Trip Speed: \_\_\_\_\_ (Cycles)

Circuit Breaker Protective Relays (if applicable):  
(Enclose copy of any proposed Time-Overcurrent Coordination Curves)

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting: \_\_\_\_\_

Current Transformer Data (if applicable):  
(Enclose copy of Manufacturer's Excitation & Ratio Correction Curves)

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Accuracy Class: \_\_\_\_\_ Proposed Ratio Connection: \_\_\_\_\_ /5  
Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Accuracy Class: \_\_\_\_\_ Proposed Ratio Connection: \_\_\_\_\_ /5

Generator Disconnect Switch:

A generator disconnect device (isolation device) must be installed if required pursuant to Section 8 of WAPA's interconnection procedures.

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Catalog No.: \_\_\_\_\_ Rated Volts: \_\_\_\_\_ Rated Amps: \_\_\_\_\_  
Single or 3 Phase: \_\_\_\_\_ Mounting Location: \_\_\_\_\_

**Section 5, General Technical Information**

Enclose copy of site single-line diagram showing configuration and interconnection of all equipment, current and potential circuits and protection and control schemes.

Is Single-Line Diagram Enclosed? Yes

Enclose copy of site relay list and trip scheme, which shall include all protection, synchronizing and auxiliary relays that are required to operate the Facility in a safe and reliable manner.

Are Relay List and Trip Scheme Enclosed? Yes

Enclose copy of site three-line diagram (if the Facility's capacity is greater than or equal to 30 kW) showing potential transformer and current transformer ratios, and details of the Facility's configuration, including relays, meters, and test switches.

Is Three-Line Diagram Enclosed? Yes

**Section 6, Installation Details**

Installing Electrical Contractor: \_\_\_\_\_ Firm: \_\_\_\_\_ License Nos.: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Telephone: Area Code: \_\_\_\_\_ Number: \_\_\_\_\_

Installation Date: \_\_\_\_\_ Interconnection Date: \_\_\_\_\_

Supply certification that the generating system has been installed and inspected in compliance with the local Building/Electrical code of the county of \_\_\_\_\_ .

Signed (Inspector): \_\_\_\_\_ Date: \_\_\_\_\_  
(In lieu of signature of Inspector, a copy of the final inspection certificate may be attached)

**Section 7, Generator/Equipment Certification**

Generating systems that utilize inverter technology must be compliant with *Institute of Electrical and Electronics Engineers IEEE Std 1547-2018 (or latest)* and *Underwriters Laboratories UL 1741 SA* (or latest) in effect at the time this Agreement is executed. Generating systems that use a rotating machine must be compliant with applicable National Electrical Code, Underwriters Laboratories, and Institute of Electrical and Electronics Engineers standards in effect at the time this Agreement is executed. **By signing below, the Customer certifies that the installed generating equipment meets the appropriate preceding requirement(s) and can supply documentation that confirms compliance.**

Signed (Customer): \_\_\_\_\_ Date: \_\_\_\_\_

**Section 8, Insurance**

Insurance Carrier: \_\_\_\_\_

## ATTACHMENT 4

### INTERCONNECTION STUDY AGREEMENT

This **AGREEMENT** (“Agreement”) is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_ by and between \_\_\_\_\_, a \_\_\_\_\_ organized and existing under the laws of the State of \_\_\_\_\_, (“Customer”) and the US Virgin Island Water and Power Authority, existing under the laws of the U.S. Virgin Islands (“WAPA”). Customer and WAPA each may be referred to as a “Party” or collectively as the “Parties.”

#### RECITALS

**WHEREAS**, Customer is proposing to develop a Generating Facility as provided in its Interconnection Application to WAPA, dated \_\_\_\_\_, 20\_\_ (the “Application”), and

**WHEREAS**, Customer desires to interconnect the Generating Facility with WAPA’s Distribution System; and

**WHEREAS**, WAPA has determined that an Interconnection Requirements Study is necessary to assess the proposed interconnection of Customer’s proposed Generating Facility to WAPA’s Distribution System;

**NOW, THEREFORE**, in consideration of and subject to the mutual covenants contained herein, the Parties agree as follows:

1. When used in this Agreement, capitalized terms shall have the meanings indicated. Capitalized terms that are not defined in this Agreement shall have the meanings specified in WAPA’s Interconnection Procedures.
2. Customer elects and WAPA shall cause to be performed a Interconnection Requirements Study consistent with the Interconnection Procedures.
3. The scope of the Interconnection Requirements Study shall be based on information supplied in the Interconnection Application and the results of Initial Review and Supplemental Review.
4. WAPA reserves the right to request additional technical information from Customer as may reasonably become necessary consistent with good engineering and operating practices during the course of the Interconnection Requirements Study. If after signing this Agreement, Customer (with WAPA’s consent) modifies its Interconnection Application or any of the information or assumptions provided to WAPA, the time to complete the Interconnection Requirements Study may be extended by agreement of the Parties.
5. In performing the Interconnection Requirements Study, WAPA may rely, to the extent reasonably practicable, on existing studies of recent vintage. Customer will not be charged for such existing studies; however, Customer shall be responsible for charges associated with any new study or modifications to existing studies that are reasonably necessary to perform the Interconnection Requirements Study.
6. WAPA may require a study deposit of the greater of fifty (50) percent of estimated non-binding good faith study costs or \$10,000.
7. The Interconnection Requirements Study shall be completed and the results shall be transmitted to

Customer [within one-hundred fifty (150) calendar days] after this Agreement is signed by the Parties.

8. Study fees shall be based on actual costs and will be invoiced to Customer after the study is transmitted to Customer.
9. Customer shall pay any actual study costs that exceed the deposit within thirty (30) days of receipt of the invoice. WAPA shall refund any excess amount without interest within thirty (30) Days of the invoice.

In witness whereof, the Parties have caused this agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

For WAPA

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
Name (printed): \_\_\_\_\_  
Title: \_\_\_\_\_

For Customer

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
Name (printed): \_\_\_\_\_  
Title: \_\_\_\_\_

Are attachments included to supplement or modify information contained in the Bid?

\_\_\_\_\_ Yes      \_\_\_\_\_ No

## ATTACHMENT 5

### INTERCONNECTION AGREEMENT

This **AGREEMENT** (“Agreement”) is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_ by and between \_\_\_\_\_, a \_\_\_\_\_ organized and existing under the laws of the State of \_\_\_\_\_, (“Customer”) and the US Virgin Island Water and Power Authority, existing under the laws of the U.S. Virgin Islands (“WAPA”).

**WHEREAS**, Customer is the owner and operator of a Generating Facility (“Facility”), as identified in its Interconnection Application and defined in Section 3 of this Agreement; and

**WHEREAS**, the Customer desires to interconnect the Facility and operate in parallel with WAPA's system upon the terms and conditions set forth herein.

**NOW, THEREFORE**, in consideration of the premises and the respective promises herein, WAPA and the Customer hereby agree as follows:

1. Scope Of Agreement: This Agreement relates solely to the conditions under which WAPA and the Customer agree that the Facility may be interconnected to and operated in parallel with WAPA’s system.
2. Parallel Operation: The Facility may interconnect and operate in parallel with WAPA's system in accordance with the terms and conditions of this Agreement.
3. Facility:
  - (a) For the purposes of this Agreement, the “Facility” is defined as the equipment and devices, and associated appurtenances, owned by the Customer, which produce electric energy for use by the Customer and are to be interconnected and operated in parallel with WAPA’s system.
  - (b) The Customer shall furnish, install, operate and maintain, at its cost, the interconnection facilities (such as circuit breakers, relays, switches, synchronizing equipment, monitoring equipment, and control and protective devices and schemes) identified in Exhibit A hereto (“Customer Interconnection Facilities”).
  - (c) The Point of Interconnection is shown on the single-line diagram and three-line diagram (provided by the Customer and reviewed by WAPA) which are attached to Exhibit A (provided that the three-line diagram is not required if the Facility’s capacity is less than 30 kW).
  - (d) The Customer agrees to test the Facility, to maintain operating records, and to follow such operating procedures, as may be specified by WAPA to protect WAPA’s system from damages resulting from the parallel operation of the Facility, including such testing, records and operating procedures as more fully described in Exhibit A attached hereto and made a part hereof.
  - (e) WAPA may inspect the Facility, as more fully described in Exhibit A .

4. Interconnection Facilities Owned by WAPA: WAPA agrees to furnish, install, operate and maintain such interconnection facilities on its side of the point of interconnection with the Facility as required for parallel operation with the Facility and as more fully described in Exhibit C attached hereto and made a part hereof (“Company Interconnection Facilities”). All such interconnection facilities shall be the property of WAPA. Where portions of WAPA interconnection facilities are located on the Customer’s premises, the Customer shall provide, at no expense to WAPA, a suitable location for and access to all such equipment. If a 120/240 Volt power source or sources are required, the Customer shall provide these at no expense to WAPA.
  
5. Customer Payments:
  - (a) The Customer agrees to pay to WAPA a reasonable non-refundable contribution for WAPA's investment in the interconnection facilities described in Exhibit B, subject to the terms and conditions included in Exhibit B, and to pay for other reasonable interconnection costs. The interconnection costs will not include the cost of an initial technical screening of the impact of the Facility on WAPA’s system, but will include the actual cost (or such lesser amount as WAPA may specify to facilitate the processing of interconnection requests for similarly situated facilities) of additional technical study for the Facility, if additional technical study is conducted.
  
  - (b) **[FOR FEDERAL GOVERNMENT ENTITIES (the “FGE”) – Replace paragraph (a) with the following:]**

The FGE agrees to pay to WAPA a reasonable non-refundable contribution for WAPA’s investment in the interconnection facilities described in Exhibit C, and to pay for other reasonable interconnection costs by means of a modification to the existing electric service contract or other contracting vehicle. The contract modification shall be executed prior to effectuating this Agreement.
  
6. Commencement of Producing Energy in Parallel: After this Agreement is executed, and the Customer Interconnection Facilities and WAPA interconnection facilities are completed, the Facility may be operated in parallel with WAPA's system, provided that the Customer has satisfied the conditions in Section 3 of Exhibit A of this Agreement.
  
7. Incidental Deliveries of Energy: WAPA shall have no duty under this Agreement to account for, pay for, deliver, or return in kind any energy produced by the Facility and delivered into WAPA’s system. The meter for service received from WAPA shall be ratcheted to prevent reverse registration.
  
8. Disconnection of Facility for Utility Reasons:
  - (a) Upon providing reasonable notice (generally not to be less than ten (10) business days for scheduled work), WAPA may require the Customer to temporarily disconnect the Facility from WAPA's system when necessary for WAPA to construct, install, maintain, repair, replace, remove, investigate, test or inspect any of its equipment or other customers’ equipment or any part of its system. If WAPA determines that such disconnection is necessary because of an unexpected system emergency, forced outage, operating conditions on its systems, or compliance with good engineering practices as determined by WAPA, WAPA will immediately attempt to notify the Customer or the Customer’s designated representatives in person, by telephone, by electronic mail, or by facsimile, of the need to disconnect the Facility. Unless the emergency condition requires

immediate disconnection as determined by WAPA, WAPA shall allow sufficient time for the Customer to manually disconnect the Facility.

- (b) The Facility shall not energize a de-energized utility line under any circumstances, but may operate its Facility isolated from the utility system with an open tie point.
  - (c) Following the completion of work and/or rectification of the emergency conditions by WAPA, WAPA shall reset the Customer's service breaker, if open, as soon as practicable and shall provide, within fifteen (15) business days or such other period as is mutually agreed upon in writing by WAPA and the Customer, written documentation of the occurrence and nature of WAPA's work and/or emergency condition, and of the disconnection of the Facility.
  - (d) WAPA shall take reasonable steps to minimize the number and duration of such disconnections.
  - (e) The disconnection of the Facility under this Section 8 shall not be subject to standby service charges.
  - (f) WAPA may disconnect the Customer from WAPA's system for failure by the Customer to disconnect the Facility under this Section 8, until such time that WAPA's work or the system condition has been corrected and the normal system condition has been restored.
9. Personnel and System Safety: Notwithstanding any other provisions of this Agreement, WAPA may disconnect the Facility from WAPA's system, without prior notice to the Customer, (a) to eliminate conditions that constitute a potential hazard to WAPA's personnel or the general public; (b) if pre-emergency or emergency conditions exist on WAPA system; (c) if a hazardous condition relating to the Facility is observed by WAPA's inspection; (d) if the Facility interferes with WAPA's equipment or equipment belonging to other customers of WAPA (including non-utility generating equipment); or (e) if the Customer of the Facility has tampered with any protective device. The Facility shall remain disconnected until such time as WAPA is satisfied that the endangering condition(s) as listed above has been corrected, and WAPA shall not be obligated to allow parallel operation of the Facility during such period. If WAPA disconnects the Facility under this Section 9, it shall as soon as practicable notify the Customer in person, by telephone, by electronic mail, or by facsimile and provide the reason(s) why the Facility was disconnected from WAPA's system. Following the rectification of the endangering conditions, WAPA shall provide, within fifteen (15) business days or such other period as is mutually agreed upon in writing by WAPA and the Customer, written documentation of the occurrence of the endangering conditions, and of the disconnection of the Facility. The disconnection of a customer's generating facility shall not be subject to standby service charges provided that the disconnection was caused by the utility or the utility's equipment.
10. Transmission Service Not Provided with Interconnection: Interconnection with WAPA's system under this Agreement does not provide the Customer any rights to utilize WAPA's system for the transmission or distribution of electric power.
11. Prevention of Interference: The Customer shall not operate equipment that superimposes a voltage or current upon WAPA's system that interferes with WAPA's operations, service to WAPA's customers, or WAPA's communication facilities. Such interference shall include, but not be limited to, overcurrent, voltage imbalance, and abnormal waveforms. If such interference occurs, the Customer must diligently pursue and take corrective action at its own expense after being given notice and reasonable time to do so by WAPA. If the Customer does not take timely corrective action, or continues to operate the equipment

causing interference without restriction or limit, WAPA may, without liability, disconnect the Customer's equipment from WAPA's system.

12. Location of Metering: Where Company-owned metering is located on the Customer's premises, the Customer shall provide, at no expense to WAPA, a suitable location for and access to all such metering.
13. Design Reviews and Inspections: WAPA's review and authorization to allow the Facility to interconnect and operate in parallel with WAPA's system shall not be construed as confirming or endorsing the Facility's design or as warranting the Facility's safety, durability or reliability. WAPA shall not, by reason of such review or lack of review, be responsible for the equipment, including but not limited to, the safety, strength, adequacy, durability, reliability, performance, or capacity of such equipment.
14. Permits, Approvals, and Licenses: The Customer shall obtain, at its expense, any and all authorizations, approvals, permits, and licenses required for the construction and operation of the Facility and the interconnection with WAPA's system, including but not limited to environmental permits, building permits, rights-of-way, or easements.
15. Term: This Agreement shall become effective when executed by the Customer and WAPA and shall continue in effect until terminated.
16. Termination: This Agreement may be terminated as follows: (a) the Customer may terminate this Agreement at any time, by giving WAPA at least sixty (60) days written notice, provided that the Facility is disconnected from WAPA's system and no longer operating in parallel with WAPA's system at the time this Agreement is terminated; (b) WAPA may terminate this Agreement upon failure by the Customer to generate energy from the Facility in parallel with WAPA's system within twelve (12) months after completion of the interconnection; (c) either party may terminate this Agreement by giving the other party at least thirty (30) days prior written notice that the other party is in default of any of the material terms and conditions of the Agreement, provided that the notice specifies the basis for the termination and there is a reasonable opportunity to cure the default; (d) WAPA may terminate this Agreement if the Facility is removed from permanent service; (e) WAPA and the Customer may terminate this Agreement at any time by mutual agreement provided that the agreement is in writing and signed by both parties; or (f) WAPA may terminate this Agreement by giving the Customer at least sixty (60) days prior written notice in the event that there is a material change in an applicable statute, rule or tariff.
17. Disconnection and Survival of Obligations: Upon termination of this Agreement the Facility shall be disconnected from WAPA's system. The termination of this Agreement shall not relieve the parties of their liabilities and obligations, owed or continuing at the time of the termination.
18. Indemnification:
  - (a) The Customer shall indemnify, defend and hold harmless WAPA and its officers, directors, agents and employees, from and against all liabilities, damages, losses, fines, penalties, claims, demands, suits, costs and expenses (including reasonable attorney's fees and expenses) to or by third persons, including WAPA's employees or subcontractors, for injury or death, or for injury to property, arising out of the actions or inactions of the Customer (or those of anyone under its control or on its behalf) with respect to its obligations under this Agreement, and/or arising out of the installation, operation and maintenance of the Facility and/or the Customer Interconnection Facilities, except to the extent that such injury, death or damage is attributable to the gross negligence or intentional act or omission of WAPA or its officers, directors, agents or employees.

- (b) WAPA shall indemnify, defend and hold harmless the Customer, and its officers, directors, agents and employees, from and against all liabilities, damages, losses, fines, penalties, claims, demands, suits, costs and expenses (including reasonable attorney's fees and expenses) to or by third persons, including the Customer's employees or subcontractors, for injury or death, or for injury to property, arising out of the actions or inactions of WAPA (or those of anyone under its control or on its behalf) with respect to its obligations under this Agreement, and/or arising out of the installation, operation and maintenance of WAPA Interconnection Facilities, except to the extent that such injury, death or damage is attributable to the gross negligence or intentional act or omission of the Customer or its officers, directors, agents or employees.
- (c) Nothing in this Agreement shall create any duty to, any standard of care with reference to, or any liability to any person or entity not a party to it.
- (d) **[FOR A CUSTOMER THAT IS AN AGENCY OF USVI GOVERNMENT]**  
The "Agency" shall be responsible for damages or injury caused by the "Agency's" agents, officers, and employees in the course of their employment to the extent that the "Agency's" liability for such damage or injury has been determined by a court or otherwise agreed to by the "Agency". The "Agency" shall pay for such damage and injury to the extent permitted by law. The "Agency" shall use reasonably good faith efforts to pursue any approvals that may be required to obtain the funding necessary to enable the "Agency" to perform its obligations or cover its liabilities hereunder. The "Agency" shall not request Company to indemnify the "Agency" for, or hold the "Agency" harmless from, any claims for such damages or injury.

Company shall be responsible for damages or injury caused by Company, Company's agents, officers, and employees in the course of their employment to the extent that Company's liability for such damage or injury has been determined by a court or otherwise agreed to by Company, and Company shall pay for such damage and injury to the extent permitted by law. Company shall not request the "Agency" to indemnify Company for, or hold Company harmless from, any claims for such damages or injury.

- (e) **[FOR A CUSTOMER THAT IS AN AGENCY OF THE FEDERAL GOVERNMENT (the "FGE") – delete paragraphs (a) through (d) and replace with the following:]**

Neither party hereto shall be responsible for loss or damage to the property of the other party or property of others, or for death or for personal injuries to the other party's officers, agents, servants, or employees, or to other persons, arising from or related to (a) WAPA's initiation of a service interruption under this contract and /or (b) the FGE's electric service being disconnected or reconnected by WAPA and/or FGE pursuant to this contract and/or (c) the parallel operation of the systems of the parties hereto or incident to the use, operation, or maintenance with respect to the furnishing of service hereunder, except for such loss, damage, death or injuries caused by the FGE for which it may be liable under the Federal Tort Claims Act and in the case of WAPA as may be caused by the negligence, wrongful act or omission of WAPA, its agents, servants or employees; nor, except for matters for which it may be liable under the Federal Tort Claims Act, shall the FGE be responsible in any way for any damage or loss of profit suffered by WAPA arising from or incident to such use, operation or maintenance.

19. Insurance:

- (a) The Customer shall, at its own expense and during the term of the Agreement and any other time that the Facility is interconnected with WAPA's system, either (a) maintain in effect with a responsible insurance company authorized to do insurance business in the United States Virgin Islands, insurance that will adequately protect the Customer and WAPA with respect to risks arising under this Agreement, including the Facility's interconnection with WAPA's system, provided the forms, amounts and conditions of such insurance coverage shall be as specified in Exhibit C hereto, or (b) self-insure, in lieu of obtaining insurance coverage from an insurance company, provided the terms of such self-insurance shall be as specified in Exhibit C hereto. Customer is responsible for determining its own level and form of insurance. The Customer's indemnity and other obligations shall not be limited by this provision. Any deductible shall be the responsibility of the Customer. In the event Customer obtains insurance from an insurance company, proof of such insurance, including certificates of insurance showing the form and amounts of coverage, must be provided to WAPA prior to any parallel interconnection. In the event Customer self-insures, documentation describing the Customer's means and capability of self-insuring must be provided to WAPA prior to any parallel interconnection.
- (b) **[FOR A CUSTOMER THAT IS AN AGENCY OF THE FEDERAL GOVERNMENT (the "FGE") – delete paragraph (a) and insert the following:]**

The Customer is considered to be self-insured for the purpose of this agreement and shall not be required to maintain any separate policy of insurance under this section of the agreement. Notwithstanding the above, this shall in no event waive or otherwise release or limit the Customer's liabilities undertaken pursuant to this agreement. WAPA agrees to maintain general liability insurance or self-insurance consistent with WAPA's commercial practice. Such insurance or self-insurance shall not exclude coverage for WAPA's liabilities undertaken pursuant to this agreement. The parties to this agreement further agree to notify each other whenever an accident or incident occurs resulting in any injuries or damages that are included within the scope of coverage of such insurance, whether or not such coverage is sought.

20. Force Majeure: For purposes of this Agreement, "Force Majeure Event" means any event: (a) that is beyond the reasonable control of the affected party; and (b) that the affected party is unable to prevent or provide against by exercising reasonable diligence, including the following events or circumstances, but only to the extent they satisfy the preceding requirements: acts of war, public disorder, insurrection, or rebellion; floods, hurricanes, earthquakes, lightning, storms, and other natural calamities; explosions or fires; strikes, work stoppages, or labor disputes; embargoes; and sabotage. If a Force Majeure Event prevents a party from fulfilling any obligations under this Agreement, such party will promptly notify the other party in writing, and will keep the other party informed on a continuing basis of the scope and duration of the Force Majeure Event. The affected party will specify in reasonable detail the circumstances of the Force Majeure Event, its expected duration, and the steps that the affected party is taking to mitigate the effects of the event on its performance. The affected party will be entitled to suspend or modify its performance of obligations under this Agreement, other than the obligation to make payments then due or becoming due under this Agreement, but only to the extent that the effect of the Force Majeure Event cannot be mitigated by the use of reasonable efforts. The affected party will use reasonable efforts to resume its performance as soon as possible.

21. Warranties: WAPA and the Customer each represents and warrants respectively that:
- (a) It has all necessary right, power and authority to execute, deliver and perform this Agreement.
  - (b) The execution, delivery and performance of this Agreement by it will not result in a violation of any law or regulation of any governmental authority, or conflict with, or result in a breach of, or cause a default under, any agreement or instrument to which such party is also a party or by which it is bound.
22. Good Engineering Practice:
- (a) Each party agrees to install, operate and maintain its respective equipment and facilities and to perform all obligations required to be performed by such party under this Agreement in accordance with good engineering practice in the electric industry and with applicable laws, rules, orders and tariffs.
  - (b) Wherever in this Agreement and the attached Exhibits WAPA has the right to give specifications, determinations or approvals, such specifications, determinations or approvals shall be given in accordance with WAPA's standard practices, policies and procedures, which may includes IEEE Guides and Standards for Protective Relaying Systems.
23. Miscellaneous:
- (a) Amendments. Any amendment or modification of this Agreement or any part hereof shall not be valid unless in writing and signed by the parties. Any waiver hereunder shall not be valid unless in writing and signed by the party against whom waiver is asserted.
  - (b) Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective successors, legal representatives, and permitted assigns.
  - (c) Notices. Any written notice provided hereunder shall be delivered personally or sent by registered or certified first class mail, with postage prepaid, to the other party at the following addresses:

Company: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Attn: \_\_\_\_\_

Customer: The mailing address listed the Interconnection Application.

Notice sent by mail shall be deemed to have been given on the date of actual delivery or at the expiration of the fifth day after the date of mailing, whichever is earlier. Any party hereto may change its address for written notice by giving written notice of such change to the other party hereto.

- (d) Effect of Section and Exhibit Headings. The headings or titles of the several sections and exhibits hereof are for convenience of reference and shall not affect the construction or interpretation of any provision of this Agreement.

- (e) Relationship of Parties. Nothing in this Agreement shall be deemed to constitute any party hereto as partner, agent or representative of the other party or to create any fiduciary relationship between the parties.
- (f) Entire Agreement. This Agreement constitutes the entire understanding and agreement between WAPA and the Customer.
- (g) Limitations. Nothing in this Agreement shall limit WAPA's ability to exercise its rights or expand or diminish its liability with respect to the provision of electrical service pursuant to WAPA's Tariff as filed with the Virgin Islands Public Services Commission ("Commission").
- (h) Governing Law and Regulatory Authority. This Agreement was executed in the United States Virgin Islands and must in all respects be governed by, interpreted, construed, and enforced in accordance with the laws thereof. This Agreement is subject to, and the parties' obligations hereunder include, operating in full compliance with all valid, applicable federal, territorial, and local laws or ordinances, and all applicable rules, regulations, orders of, and tariffs approved by, duly constituted regulatory authorities having jurisdiction.
- (i) Multiple Counterparts. This Agreement may be executed in two or more counterparts, each of which is deemed an original, but all constitute one and the same instrument.

**IN WITNESS WHEREOF**, WAPA and the Customer have executed this Agreement as of the day and year first above written.

By \_\_\_\_\_  
 Name  
 Title  
 Date

By \_\_\_\_\_  
 Name  
 Title  
 Date

By \_\_\_\_\_  
 Name  
 Title  
 Date

"Company"

"Customer"

## EXHIBIT A

### FACILITY OWNED BY THE CUSTOMER

#### 1. Facility

- a. Compliance with laws and standards. The Facility, Facility design, and Facility design drawings shall meet all applicable national, territory, and local laws, rules, regulations, orders, construction and safety codes, and shall satisfy WAPA's Generating Facility Interconnection Procedures and Technical Requirements ("Interconnection Standards"), as set forth in the Interconnection Document.
- b. Avoidance of adverse system conditions. The Facility shall be designed, installed, operated and maintained so as to prevent or protect against adverse conditions on WAPA's system that can cause electric service degradation, equipment damage, or harm to persons, such as:

- (i) Unintended islanding.
- (ii) Inadvertent and unwanted re-energization of a Company dead line or bus.
- (iii) Interconnection while out of synchronization.
- (iv) Overcurrent.
- (v) Voltage imbalance.
- (vi) Ground faults.
- (vii) Generated alternating current frequency outside of permitted safe limits.
- (viii) Voltage outside permitted limits.
- (ix) Poor power factor or reactive power outside permitted limits.
- (x) Abnormal waveforms.

- c. Provision of grid support. Grid support refers to stable behavior of a Generating Facility in case of voltage depressions caused by grid faults (i.e., fault ride-through capability.) This is necessary to avoid the sudden disconnection of generating units in medium- and low-voltage networks during normal clearing of faults on the network. Generating Facilities must fulfill the following requirements:

- During faults, Generating Facility units should not disconnect from the grid.
- During faults, reactive power for grid voltage stability must be supplied by the Generating Facility.

These performance criteria should be met during all fault types (i.e., three-phase faults, line to ground faults, etc.). In addition, the operation of the Generating Facility must continue for a specified fault duration. After a period of zero voltage, the recovery voltage transient may cause a trip by the default settings in Table 1. IEEE 1547-2018 defines the response of DERs during abnormal conditions (of voltage and frequency).

**Table 1 – Ride through-compatible response to abnormal voltages** (Table 16 – IEEE 1547-2018)

Voltage range (p.u.)	Operating mode/response	Minimum ride-through time (s) (design criteria)	Maximum response time (s) (design criteria)
$V > 1.20$	Cease to Energize <sup>a</sup>	N/A	0.16
$1.10 < V \leq 1.20$	Momentary Cessation <sup>b</sup>	12	0.083
$0.88 \leq V \leq 1.10$	Continuous Operation	Infinite	N/A
$0.70 \leq V < 0.88$	Mandatory Operation	20	N/A
$0.50^c \leq V < 0.70$	Mandatory Operation	10	N/A
$V < 0.50^c$	Momentary Cessation <sup>b</sup>	1	0.083

<sup>a</sup>Cessation of current exchange of DER with Area EPS in not more than the maximum specified time and with no intentional delay. This does not necessarily imply disconnection, isolation, or a trip of the DER. This may include momentary cessation or trip.

<sup>b</sup>Temporarily cease to energize an EPS, while connected to the Area EPS, in response to a disturbance of the applicable voltages or the system frequency, with the capability of immediate restore output of operation when the applicable voltages and the system frequency return to within defined ranges.

<sup>c</sup>The voltage threshold between mandatory operation and momentary operation may be changed by mutual agreement between the Area EPS operator and DER operator, for example to allow the DER to provide Dynamic Voltage Support below 0.5 p.u.

### Frequency Disturbances

Frequency Disturbances: The Generating Facility shall be equipped with protective equipment designed to automatically disconnect the Generating Facility from the utility distribution system when the frequency at the Point of Interconnection deviates outside the utility specified operating range set forth below and remain disconnected until the voltage and frequency have stabilized. All Generating Facilities shall have frequency set points and clearing times selected by the utility and provided below, to coordinate with the utility’s system relay settings. See IEEE 1547-2018 for clarification.

**Table 2 – DR system response to abnormal frequencies** (Table 18 – IEEE 1547-2018)

Shall trip function	Default settings <sup>a</sup>		Ranges of allowable settings <sup>b</sup>	
	Frequency <sup>c</sup> (Hz)	Clearing time (s)	Frequency (Hz)	Clearing time (s)
OF2	62.0	0.16	61.8–66.0	0.16–1 000.0
OF1	61.2	300.0	61.0–66.0	180.0–1 000.0
UF1	58.5	300.0 <sup>c</sup>	50.0–59.0	180.0–1 000
UF2	56.5	0.16	50.0–57.0	0.16–1 000

<sup>a</sup>The frequency and *clearing time* set points shall be field adjustable. The actual applied underfrequency (UF) and overfrequency (OF) trip settings shall be specified by the Area EPS operator in coordination with the requirements of the *regional reliability coordinator*. If the Area EPS operator does not specify any settings, the default settings shall be used.

<sup>b</sup>The *ranges of allowable settings* do not mandate a requirement for the DER to ride through this magnitude and duration of abnormal frequency condition. The Area EPS operator may specify the frequency thresholds and maximum *clearing times* within the *ranges of allowable settings*; settings outside of these ranges shall only be allowed as necessary for DER equipment protection and shall not conflict with the frequency disturbance ride through requirements specified in 6.5.2. For the overfrequency (OF) and underfrequency (UF) trip functions *clearing time* ranges and for the OF trip functions frequency ranges, the lower value is a limiting requirement (the setting shall not be set to lower values) and the upper value is a minimum requirement (the setting may be set above this value). For the UF trip functions frequency ranges, the upper value is a limiting requirement (the setting shall not be set to greater values) and the lower value is a minimum requirement (the setting may be set to lower values).

<sup>c</sup>This time shall be chosen to coordinate with typical regional underfrequency load shedding programs and expected frequency restoration time.

- d. Specification of protection, synchronizing and control requirements. The Customer shall provide the design drawings, operating manuals, manufacturer's brochures/instruction manual and technical specifications, manufacturer's test reports, bill of material, protection and synchronizing relays and settings, and protection, synchronizing, and control schemes for the Facility to WAPA for its review, and WAPA shall have the right to specify the protection and synchronizing relays and settings, and protection, synchronizing and control schemes that affect the reliability and safety of operation and power quality of WAPA's system with which the Facility is interconnected ("Facility Protection Devices/Schemes"). After the implementation of the protection and synchronizing relays and settings, and protection, synchronizing and control schemes, WAPA may require changes in the protection and synchronizing relays and settings, and protection, synchronizing and control schemes, when required by WAPA's system operations, at WAPA's expense. After the implementation of the protection and synchronizing relays and settings, and protection, synchronizing and control schemes, WAPA may require changes in the protection and synchronizing relays and settings, and protection, synchronizing and control schemes, when required by the Facility's operations, at the Customer's expense.
- e. Facility protection. The Customer is solely responsible for providing adequate protection for the Facility.
- f. Customer Interconnection Facilities.
- (i) The Customer shall furnish, install, operate and maintain interconnection facilities (such as circuit breakers, relays, switches, synchronizing equipment, monitoring equipment, and control and protective devices and schemes) designated by or acceptable to WAPA as suitable for parallel operation of the Facility with WAPA's system ("Customer Interconnection Facilities"). Such facilities shall be accessible at all times to authorized Company personnel.
  - (ii) The Customer shall comply with WAPA's Interconnection Standards. If a conflict exists between the Interconnection Standards and this Agreement, this Agreement shall control.
  - (iii) A 1) single-line diagram, 2) relay list, trip scheme and settings of the Facility, 3) Facility Equipment List, and 4) three-line diagram (if the Facility's capacity is greater than or equal to 30 kW), which identify the circuit breakers, relays, switches, synchronizing equipment, monitoring equipment, and control and protective devices and schemes, shall, after having obtained prior consent from WAPA, be attached to this Exhibit A and made a part hereof at the time the Agreement is signed. The single-line diagram shall include pertinent information regarding operation, protection, synchronizing, control, monitoring and alarm requirements. The single-line diagram and three-line diagram shall expressly identify the point of interconnection of the Facility to WAPA's system. The relay list, trip scheme and settings shall include all protection, synchronizing and auxiliary relays that are required to operate the Facility in a safe and reliable manner. The three-line diagram shall show potential transformer and current transformer ratios, and details of the Facility's configuration, including relays, meters, and test switches.
- g. Approval of Design Drawings. If the Facility's capacity is greater than or equal to 30 kW, the single-line diagram, relay list, trip scheme and settings of the Facility, and three-line diagram shall be approved by a Professional Electrical Engineer registered in the United States Virgin Islands prior to being submitted to WAPA. Such approval shall be indicated by the engineer's professional seal on all drawings and documents.

2. Verification Testing.

- a. Upon initial parallel operation of the Facility, or any time interface hardware or software is changed, a verification test of Customer Interconnection Facilities shall be performed by Customer. A qualified individual, hired or employed by the Customer, shall perform the verification testing in accordance with the manufacturer's published test procedure. Qualified individuals include professional engineers, factory trained and certified technicians, and licensed electricians with experience in testing protective equipment. WAPA reserves the right to witness verification testing or require written certification that the testing was performed
- b. Verification testing shall be performed every four years. All verification tests prescribed by the manufacturer shall be performed. If wires must be removed to perform certain tests, each wire and each terminal shall be clearly and permanently marked. The Customer shall maintain verification test reports for inspection by WAPA.
- c. Single-phase inverters rated 10 kVA and below (if any) shall be verified once per year as follows: once per year the Customer shall operate the load break disconnect switch and verify the Facility automatically shuts down and does not reconnect with WAPA's system until WAPA's system continuous normal voltage and frequency have been maintained for a minimum of 5 minutes. The Customer shall maintain a log of these operations for inspection by WAPA.
- d. Any system that depends upon a battery for trip power shall be checked once per month for proper voltage. Once every four (4) years the battery shall either be replaced or have a discharge test performed. The Customer shall maintain a log of these operations for inspection by WAPA.
- e. Tests and battery replacements as specified in this section 2 of Exhibit A shall be at the Customer's expense.

3. Inspection of the Facility.

- a. WAPA may, in its discretion and upon reasonable notice not to be less than 24 hours (unless otherwise agreed to by WAPA and the Customer), observe the construction of the Facility (including but not limited to relay settings and trip schemes) and the equipment to be installed therein.
- b. Within fourteen days after receiving a written request from the Customer to begin producing electric energy in parallel with WAPA's system, WAPA may inspect the Facility (including but not limited to relay settings and trip schemes) and observe the performance of the verification testing. WAPA may accept or reject the request to begin producing electric energy based upon the inspection or verification test results.
- c. If WAPA does not perform an inspection of the Facility (including but not limited to relay settings and trip schemes) and observe the performance of verification testing within the fourteen-day period, the Customer may begin to produce energy after certifying to WAPA that the Facility has been tested in accordance with the verification testing requirements and has successfully completed such tests. After receiving the certification, WAPA may conduct an inspection of the Facility (including but not limited to relay settings and trip schemes) and make reasonable inquiries of the Customer, but only for purposes of determining whether the verification tests were properly performed. The Customer shall not be required to perform the verification tests a second time, unless irregularities appear in the verification test report or there are other objective indications that the tests were not properly performed in the first instance.

- d. WAPA may, in its discretion and upon reasonable notice not to be less than 24 hours (unless an apparent safety or emergency situation exists which requires immediate inspection to resolve a known or suspected problem), inspect the Facility (including but not limited to relay settings and trip schemes) and its operations (including but not limited to the operation of control, synchronizing, and protection schemes) after the Facility commences operations.

4. Operating Records and Procedures.

- a. WAPA may require periodic reviews of the maintenance records, and available operating procedures and policies of the Facility.
- b. The Customer must separate the Facility from WAPA's system whenever requested to do so by WAPA's System Operator pursuant to Sections 8, 9, and 11 of the Agreement. It is understood and agreed that at times it may not be possible for WAPA to accept electric energy due to temporary operating conditions on WAPA's system, and these periods shall be specified by WAPA's System Operator. Notice shall be given in advance when these are scheduled operating conditions.
- c. Logs shall be kept by the Customer for information on unit availability including reasons for planned and forced outages; circuit breaker trip operations, relay operations, including target initiation and other unusual events. WAPA shall have the right to review these logs, especially in analyzing system disturbance.

5. Changes to the Facility, Operating Records, and Operating Procedures.

- a. The Customer agrees that no material changes or additions to the Facility as reflected in the single-line diagram, relay list, trip scheme and settings of the Facility, Facility Equipment List, and three-line diagram (if the Facility's capacity is greater than or equal to 30 kW), shall be made without having obtained prior written consent from WAPA.
- b. As a result of the observations and inspections of the Facility (including but not limited to relay list, trip scheme and settings) and the performance of the verification tests, if any changes in or additions to the Facility, operating records, and operating procedures and policies are required by WAPA, WAPA shall specify such changes or additions to the Customer in writing, and the Customer shall, as soon as practicable, but in no event later than thirty (30) days after receipt of such changes or additions, respond in writing, either noting agreement and action to be taken or reasons for disagreement. If the Customer disagrees with WAPA, it shall note alternatives it will take to accomplish the same intent, or provide WAPA with a reasonable explanation as to why no action is required by good engineering practice.

(Additional terms and provisions to be added as necessary. Note: This parenthetical phrase should be deleted when the agreement is finalized.)

## **FACILITY EQUIPMENT LIST**

The Facility shall include the following equipment:

(Specific items to be added as necessary. Note: This parenthetical phrase should be deleted when the agreement is finalized.)

(This Facility Equipment List, together with the single-line diagram, relay list and trip scheme, and three-line diagram (if the Facility's capacity is greater than or equal to 30 kW), should be attached behind Exhibit A. Note: This parenthetical phrase should be deleted when the agreement is finalized.)

## EXHIBIT B

### INTERCONNECTION FACILITIES OWNED BY WAPA

1. Description of Company Interconnection Facilities

WAPA will purchase, construct, own, operate and maintain all interconnection facilities required to interconnect WAPA's system with the Facility at \_\_\_ volts, up to the point of interconnection.

WAPA Interconnection Facilities, for which the Customer agrees to pay, include:

[Need to specify the interconnection facilities. If no interconnection facilities, state "None".]

2. Customer Payment to Company for Company Interconnection Facilities, Review of Facility, and Review of Verification Testing

The Customer shall pay to WAPA the total estimated interconnection cost to be incurred by WAPA (Total Estimated Interconnection Cost), which is comprised of (i) the estimated cost of WAPA Interconnection Facilities, (ii) the estimated engineering costs associated with a) developing WAPA Interconnection Facilities and b) reviewing and specifying those portions of the Facility which allow interconnected operations as such are described in Exhibit A, and iii) reviewing the verification testing. The following summarizes the Total Estimated Interconnection Cost:

<u>Description</u>	<u>Estimated Cost (\$)</u>
--------------------	----------------------------

[Need to specify the estimated interconnection cost. If no cost, state "None". If WAPA determines that there are benefits to the utility system due to WAPA interconnection facilities, a credit reflecting these benefits shall be provided to the Customer, subject to Commission approval. See Interconnection Document concerning this subject. The amount of the credit reflecting these benefits, if any, would be reflected in this section of the Standard Interconnection Agreement.]

**Total Estimated Interconnection Cost**                    \$

The Total Estimated Interconnection Cost, which, except as otherwise provided herein, is non-refundable, shall be paid by the Customer fourteen (14) days after receipt of an invoice from WAPA, which shall be provided not less than thirty (30) days prior to start of procurement of WAPA Interconnection Facilities.

Within thirty (30) days of receipt of an invoice, which shall be provided within fourteen (14) days of the final accounting, which shall take place within sixty (60) days of completion of construction of WAPA Interconnection Facilities, the Customer shall remit to WAPA the difference between the Total Estimated Interconnection Cost paid to date and the lesser of one hundred twenty percent (120%) of the Total Estimated Interconnection Cost or the total actual interconnection cost (Total Actual Interconnection Cost). The latter is comprised of (i) the total costs of WAPA Interconnection Facilities, and (ii) the total engineering costs associated with a) developing WAPA Interconnection Facilities and b) reviewing and specifying those portions of the Facility which allow interconnected operations as such are described in Exhibit A, and iii) reviewing the verification testing. If in fact the Total Actual Interconnection Cost is less than the payments received by WAPA as the Total

Estimated Interconnection Cost, WAPA shall repay the difference to the Customer within thirty (30) days of the final accounting.

If the Agreement is terminated prior to the Customer's payment for the Total Actual Interconnection Cost (or the portion of this cost which has been incurred) or prior to WAPA's repayment of the over-collected amount of the Total Estimated Interconnection Cost (or the portion of this cost which has been paid), such payments shall be made by the Customer or Company, as appropriate. If payment is due to WAPA, the Customer shall pay within thirty (30) days of receipt of an invoice, which shall be provided within fourteen (14) days of the final accounting, which shall take place within sixty (60) days of the date the Agreement is terminated. If payment is due to the Customer, WAPA shall pay within thirty (30) days of the final accounting.

All Company Interconnection Facilities shall be the property of WAPA.

3. Operation, Maintenance and Testing Costs

WAPA will bill the Customer monthly and the Customer will, within 30 days after the billing date, reimburse WAPA for any costs incurred in operating, maintaining or testing WAPA Interconnection Facilities, to the extent such costs are not included in or are not appropriate for inclusion in WAPA's base rates. WAPA's costs will be determined on the basis of outside service costs, direct labor costs, material costs, transportation costs, applicable overheads at time incurred and applicable taxes. Applicable overheads will include such costs as vacation, payroll taxes, non-productive wages, supervision, tools expense, employee benefits, engineering administration, corporate administration, and materials handling.

4. Customer Use of Company Interconnection Facilities Upon Termination

Notwithstanding that all Company Interconnection Facilities are the property of WAPA, upon termination of the Agreement, WAPA shall identify any equipment paid for by the Customer that can feasibly be returned to the Customer. If Customer desires such equipment, Customer shall pay for the removal of the equipment and the restoration of WAPA's system to WAPA's satisfaction.

## **EXHIBIT C**

### **CUSTOMER INSURANCE COVERAGE**

In accordance with section 19 of the Agreement, Customer shall maintain the following insurance and under the following conditions:

In the alternative, in accordance with section 19 of the Agreement, Customer shall self-insure against risks arising under this Agreement in the following manner and under the following conditions: