



# GENERATOR INTERCONNECTION REQUIREMENTS

*See Customer Generation Interconnection Standards:  
Net Metering-100 kW or Less, for Net Metered installations*

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# **GENERATOR INTERCONNECTION REQUIREMENTS**

For Generating Facilities Interconnecting to the Electrical System

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## **1. PURPOSE AND SCOPE**

### **1.1. Purpose**

The purpose of this document is to establish the terms, conditions, technical requirements, processes and charges governing the interconnection of electric generating facilities to the Electric System over which Clark Public Utilities has jurisdiction.

### **1.2. Scope**

1.2.1. **Generator Interconnection Only.** This document sets the terms and conditions under which the Applicant's Generating Facility will interconnect with, and Operate in Parallel with, Clark's Electric System. These requirements apply only to the physical interconnection of a Generating Facility to Clark's Electric System.

They do not govern, or grant the right to sell or purchase, or deliver any power generated by the Applicant's Generating Facility.

Generator interconnections that are within the scope of these *Generator Interconnection Requirements* are:

1.2.1.1. Customer-owned electric Generating Facilities with a generating capacity Nameplate Rating of no more than 20 megawatts proposed to be interconnected to Clark's Electric System (Tiers 1, 2, or 3);

1.2.1.2. Customer-owned electric Generating Facilities with a generating capacity Nameplate Rating equal to or greater than 20 megawatts proposed to be interconnected to Clark's Electric System; and

1.2.1.3. Non-customer-owned electric Generating Facilities proposed to be interconnected to Clark's Electric System.

1.2.2. **Protection of Clark Only.** The specifications in this document are intended to mitigate possible adverse impacts caused by a Generating Facility on Clark equipment and personnel, on other customers of Clark, and on adjacent transmission owners. They are not intended to address protection of the Interconnection Customer's Generating Facility, facility personnel, or internal load. It is the responsibility of the Interconnection Customer to comply with the requirements of all appropriate standards, codes, statutes and authorities to protect its own facilities, personnel, and loads.



- 1.2.3. Non-Net Metered Generators Only. These requirements are not intended for typical net metered generation. Please refer to Clark's *Customer Generation Interconnection Standards: Net Metering-100 kW or Less.*

## 2. APPLICATION OF RULES

These requirements include the various requirements applicable to Clark, the Applicant, the Interconnection Customer and the Generating Facility. These requirements modify, if necessary, any existing interconnection rules of Clark. Additionally, these requirements do not apply to interconnection of standby or backup generators that are not intended to Operate in Parallel with Clark's system. Such interconnections will be negotiated on a case-by-case basis with Clark and such generators will only be interconnected on terms and conditions prescribed by Clark.

## 3. DEFINITIONS

**"Affected Interconnecting Entity(ies)"** means Balancing Authorities, Planning Coordinators, Transmission Planners and Transmission Owners having personnel or facilities that are potentially impacted by a proposed Interconnection as determined by Clark.

**"Applicant"** means any person, corporation, partnership, government agency, or other entity applying to interconnect a Generating Facility to Clark's Electric System pursuant to these *Generator Interconnection Requirements*. Upon final approval for Interconnection and Parallel Operation of a facility, the Applicant becomes the Interconnection Customer, unless otherwise approved by Clark.

**"Application"** means the written notice, on a form prescribed by Clark, provided by the Applicant to Clark that initiates the Interconnection process.

**"Automatic Sectionalizing Device"** means equipment which operates to change the topology of the Electrical System (usually in response to abnormal conditions) without operator intervention. Generally, this does not include fused cutouts on lateral taps serving a few customers.

**"Bulk Electric System (or BES)"** means that portion of the Transmission System meeting the definition of BES as established by the North American Electric Reliability Corporation (or NERC).

**"Business Day"** means Monday through Friday excluding official federal and Washington state holidays.

**"Certificate of Completion"** means the form prescribed by Clark and completed by the Applicant or Interconnection Customer for Tier 1 or Tier 2 Generating Facilities.



The Certificate of Completion will include certification by the electrical inspector having jurisdiction over the installation of the facilities indicating completion of installation and inspection of the Interconnection.

**“Customer-Owned Generator”** means a device that produces electrical energy (other than a standby generator designed and used only to provide power to the customer when electrical company service is interrupted) and is owned by an electric retail customer (residential, commercial, or industrial) of Clark.

**“Distribution System”** means that portion of Clark’s Electrical System with a nominal operating voltage that is less than 69 kV.

**"Electric System (or Electrical System)"** means all electrical wires, equipment, and other facilities owned or provided by Clark consisting of the Distribution System and the Transmission System that are used to deliver electric energy.

**"Generating Facility"** means the source of electricity and all ancillary and interconnection facilities, located on the Applicant’s or Interconnection Customer’s side of the Point of Delivery which an Applicant requests to interconnect, or an Interconnection Customer interconnects to Clark’s Electric System.

**"Grid Network Distribution System"** means electrical service from the distribution side of Clark’s Electric System consisting of two or more primary circuits from one or more substations or transmission supply points arranged such that they collectively feed secondary circuits serving more than one location and more than one Clark customer.

**"Initial Operation"** means the first time the Generating Facility is in Parallel Operation with Clark’s Electric System.

**"In-service Date"** means the date on which the Generating Facility and any related facilities are complete and ready for service, even if the Generating Facility is not placed in service on or by that date.

**"Interconnection"** means the physical connection of a Generating Facility to the Electric System so that Parallel Operation may occur.

**“Interconnection Agreement”** means an agreement between Clark and the Interconnection Customer which outlines the Interconnection requirements, costs and billing agreements, and on-going inspection, maintenance and operational requirements. An executed Interconnection Agreement is required before the Generating Facility may generate electricity into and Operate in Parallel with Clark’s Electric System. Contents of an Interconnection Agreement may vary



based upon the Tier or other classification under which the Generating Facility applies and is qualified for interconnection. Clark may establish model Interconnection Agreement(s). In the case where the Interconnection Agreement does not constitute an agreement with Clark to purchase or deliver output from the Generating Facility, the Interconnection Customer is responsible for separately making all necessary agreements for the purchase, sale, or transport of electricity from Clark and/or other parties.

**"Interconnection Customer"** means the person, corporation, partnership, government agency, or other entity that has executed an Interconnection Agreement with Clark and owns a Generating Facility interconnected to Clark's Electric System. The Interconnection Customer is responsible for the Generating Facility, and may assign to another party responsibility for compliance with the requirements of this role only with the express written permission of Clark.

**"Interconnection Facilities"** means the electrical wires, switches and other equipment used to interconnect a Generating Facility to Clark's Electric System.

**"Model Interconnection Agreement"** means the standardized terms and conditions that govern the Interconnection of Generating Facilities in accordance with these *Generator Interconnection Requirements*. The Model Interconnection Agreement may be modified to accommodate terms and conditions specific to individual Interconnections, subject to the conditions set forth in these rules.

**"Nameplate Rating"** means the manufacturer's output rating of equipment that is part of a Generating Facility. For a system which uses an inverter to change DC energy supplied to an AC quantity, the Nameplate Rating will be the DC rating of the storage system or energy conversion apparatus (e.g. photovoltaic panels). This rating should be based on the most limiting equipment rating for all elements of the generating facility (i.e. generator, bus, transformers, protection system, etc.).

**"Parallel Operation"** or **"Operate in Parallel"** means the synchronous operation of a Generating Facility while interconnected with Clark's Electric System.

**"Point of Delivery"** or **"POD"** means the point where the Generating Facility's local electric power system connects to Clark's Electric System, such as the electric power revenue meter or at the location of the equipment designated to interrupt, separate or disconnect the connection between the Generating Facility and Clark.

**"Spot Network Distribution System"** means electrical service from a Distribution System consisting of two or more primary circuits from one or more substations or transmission supply points arranged such that they collectively feed a secondary



circuit serving a single location (e.g., a large facility or campus) containing one or more Clark customer(s).

“**Tier**” means the classification of Customer-Owned Generator Interconnection requests into Tiers 1, 2, or 3 based on the size and connection characteristics of the generator as provided for in Part 5 herein.

“**Tier 3 and Other Generator**” means either (1) a Customer-Owned Generator Interconnection not qualifying for Tiers 1 or 2 or (2) any generator that is not customer owned; all as provided for in Part 5 herein.

“**Transmission System**” means that portion of Clark’s Electrical System with a nominal operating voltage that is 69 kV or greater.

“**Clark**” means Clark Public Utilities, which owns and operates the Electric System, or the Electric System itself, onto which the applicant seeks to interconnect a Generating Facility, and with which an Interconnection Customer has an Interconnection Agreement. These *Generator Interconnection Requirements* have been adopted by Clark due to its registered status at NERC as a Transmission Owner (TO), Generator Owner (GO), Distribution Provider (DP), and Transmission Planner (TP).

#### **4. APPLICATION FOR INTERCONNECTION**

##### **4.1. Application.**

A standard Application form for Tier 1 or Tier 2 Generator Interconnections can be found in Appendix B of this document. A standard Application form for all Tier 3 and Other Generator Interconnections can be found in Appendix D of this document.

4.1.1. When an Applicant requests interconnection from Clark, the Applicant will be responsible for conforming to the rules and regulations that are in effect and on file with Clark. The Applicant seeking to interconnect a Generating Facility in accordance with these *Generator Interconnection Requirements* must fill out and submit, electronically or otherwise, a signed Application form to Clark. Information must be accurate, complete, and approved by Clark; however, approval of the Application as complete does not constitute approval to interconnect.

4.1.2. If there are multiple Generating Facilities, or multiple Points of Delivery at a site, additional applications may be required for each facility. The applicable Tier level, related requirements, and charges will be determined by Clark.



- 4.1.3. If a Generating Facility is to be installed in a phased manner, the Applicant may choose to submit an Interconnection Application for approval of the final project size or may choose to submit Applications at each stage of the project. Each Application will be evaluated based on the Nameplate Rating stated on the Application.
- 4.1.3.1. If the final project size is applied for and the requirements are met, then the Applicant must notify Clark as additional units are added.
- 4.1.3.2. If Applications are submitted for different stages of a project, the size may not be increased beyond that approved. Additional stages may result in the entire Generating Facility being subject to increased requirements as provided for herein based on the cumulative Nameplate Rating.

4.2. **Application Processing Charge.**

The nonrefundable Interconnection Application processing charge is set by Clark according to facility size (or Tiers in this rule) and will be:

- 4.2.1. **Tier 1 Generator.** 0 through 25 kW. \$100.
- 4.2.2. **Tier 2 Generator.** Greater than 25 kW but less than 500 kW. \$500.
- 4.2.3. **Tier 3 and Other Generator.** Greater than or equal to 500 kW but less than 20 MW. \$1,000.
- 4.2.4. **Tier 3 and Other Generator.** Greater than or equal to 20 MW. \$2,000.

4.3. **Non-Discrimination.**

All Generating Facility Interconnection Applications pursuant to these *Generator Interconnection Requirements* will be processed by Clark in a non-discriminatory manner, consistent with other service requests and in a manner that does not delay other previously received service requests.

4.4. **Application Evaluation.**

All Generating Facility Interconnection requests pursuant to these *Generator Interconnection Requirements* will be reviewed by Clark for compliance with the rules as stated herein. If Clark in its sole discretion finds that the Application does not comply with these *Generator Interconnection Requirements*, Clark may reject the Application. If Clark rejects the Application, it will provide the Applicant with written or electronic mail notification stating its reasons for rejecting the Application.

5. **GENERATOR FACILITY CLASSIFICATION, PROCEDURES, AND REQUIREMENTS**

Because Clark's Distribution System was not originally designed with the intent of interconnecting generating facilities, the impacts of such an interconnection (on





Clark and its customers), if not carefully managed, can be detrimental to the safe and reliable operation of the system. In addition, since Clark’s Transmission System is interconnected with other transmission owners’ electric systems within the Western Interconnection, Clark must ensure that its Transmission System and the electric grid to which Clark is connected is protected from adverse conditions that could be caused by a generator. Unless specifically permitted by Clark, generating facilities are not allowed to operate in an “islanded” condition (generating energy that flows onto Clark system) with other Clark customers when the portion of Clark system serving the Generating Facility is de-energized. In order to facilitate the interconnection process for both the Applicant and Clark, these requirements classify interconnections based on shared characteristics. Because smaller facilities with appropriate interconnection technologies are expected to have a much lower impact on Clark’s Electric System, expedited processes and standardized interconnection requirements are applied to these interconnections. Larger Generating Facilities using different generating and interconnection technologies can have more significant impacts on Clark’s Electric System, such that more in-depth review is required and additional technical requirements may apply. The generator classifications listed below contain initial applicability tests that will determine which process an Applicant and Clark will utilize, along with process descriptions, technical requirements and completion criteria for each generator classification. All facilities must meet the appropriate and applicable requirements of Part 6, General Terms, Conditions, and Technical Specifications, and the rules and standards adopted by reference in Part 7. Note that the interconnection requirements listed are for protection of Clark system. The Applicant and Interconnection Customer are responsible for providing protection for their own equipment; typically, these are two very different sets of functions. Appendix A contains a flow chart describing the applicability for the Tier Process.

5.1. **Tier 1 Generator.**

5.1.1. **Tier 1 Applicability.**

Interconnection of a Generating Facility will utilize Tier 1 processes and technical requirements if the proposed Generating Facility meets all of the following:

- 5.1.1.1. Is a Customer-Owned Generator;
- 5.1.1.2. Uses inverter-based interconnection equipment which is UL listed under UL1741, certified to meet UL 1741SB performance requirements and meet the requirements of IEEE 1547-2018;
- 5.1.1.3. Is single-phase and has a Nameplate Rating of 25 kW or less;

- 5.1.1.4. Is connected through a single-phase transformer on a radial distribution circuit;
- 5.1.1.5. Is proposed for interconnection at secondary voltages (600 V class);
- 5.1.1.6. Does not require construction of new or upgrade of existing Clark facilities, other than meter changes;
- 5.1.1.7. The aggregated generating capacity on the service wire does not exceed the service wire capability.
- 5.1.1.8. The aggregated generating capacity on the transformer secondary does not exceed the nameplate of the transformer.
- 5.1.1.9. If proposed to be interconnected on a center tap neutral of a 240-volt service, its addition will not create an imbalance between the two sides of the 240-volt service of more than 5 kVA; and
- 5.1.1.10. The aggregated Nameplate Rating of all interconnected Generating Facilities, including that of the proposed Generating Facility, on any line section does not exceed 15% of the line section annual peak load as most recently measured or calculated for that line section, or 15% of the circuit annual peak load as most recently measured or calculated for the circuit. A line section is that portion of Clark's Electric System connected to the Generating Facility and bounded by Automatic Sectionalizing Devices or the end of the distribution line.

5.1.2. **Tier 1 Application Process.**

The following Application timelines are intended to be consistent with, and not cause delays in other service request Applications of Clark.

- 5.1.2.1. Applicants for a Customer-Owned Generator Interconnection will make a determination of the generator categorization (Tier 1, Tier 2 or Tier 3) using the Process Flowchart shown in Appendix A.
  - 5.1.2.1.1. Based on the review of the requested Generating Facility, Clark may alter the categorization determined by an Applicant and apply the applicable Application and technical requirements.
- 5.1.2.2. Applicants will complete the Tier 1 or Tier 2 Generator Interconnection Application shown in Appendix B.

- 5.1.2.3. When an incomplete Application notice is sent to an Applicant, the Applicant will provide a complete Application to Clark within 60 Business Days of the notice of incomplete Application. Clark may, but is not required to grant an extension beyond the 60 days' notice of an incomplete Application. After the end of the incomplete Application period an Application expires.
  - 5.1.2.4. Within 20 Business Days after a complete Application is provided to Clark, Clark will make its best effort to approve, approve with conditions, or deny the Application with written justification. If delays will result due to unforeseen circumstances, customer variance requests, or other incentive program approval requirements, the Applicant will be notified.
  - 5.1.2.5. An Applicant has one year from the date of approval of the Application to interconnect and begin operation of the Generating Facility, or the Application expires, unless extended by Clark in writing. Such extension will be at Clark's sole discretion. Applications automatically expire on the one-year anniversary of the approval of the Application unless extended.
- 5.1.3. **Tier 1 Technical Requirements.**
- The purpose of the protection required for Tier 1 Generating Facilities is to prevent islanding and to ensure that inverter output is disconnected when Clark source of electricity is de-energized. Inverters must be UL listed under UL1741, certified to meet UL 1741SB performance requirements and meet the requirements of IEEE 1547-2018. Inverters must use under-voltage, over-voltage, and over/under frequency elements to detect loss of Clark power and initiate shutdown. An interrupting device must be provided which is capable of safely interrupting the maximum available fault current (typically the maximum fault current is that supplied by Clark). The Generating Facility must operate within the voltage and power factor ranges specified by Clark. Variance may be allowed based on specific requirements, and charges may be incurred for losses.
- 5.1.3.1. **Visible Lockable Disconnect.**
    - 5.1.3.1.1. Except as provided for in Part 5.1.3.1.3 of this Tier 1 Technical Requirements Section, the Generating Facility must include a UL listed AC disconnect switch, accessible to Clark personnel at any time of

the day, that provides a visible break, is lockable in the open position, and is located near the production meter of the Generating Facility.

5.1.3.1.2. Clark will have the right to disconnect the Generating Facility at the disconnect switch to meet Clark operating safety requirements.

5.1.3.1.3. An Interconnection Customer installing and operating inverter-based systems less than 25 kW in Nameplate Rating that is interconnected through a self-contained socket-based meter of 320 amps or less may, at Clark's discretion, be permitted to operate without the installation of a visible, lockable AC disconnect switch.

5.1.3.1.3.1. To maintain Clark's operating and personnel safety in the absence of an external disconnect switch, the Interconnection Customer shall agree that Clark has the right to disconnect electric service through other means if the Generating Facility must be physically disconnected for any reason, without liability to Clark. These other actions to disconnect the Generating Facility (due to an emergency or maintenance or other condition on Clark's Electric System) will result in loss of electrical service to the customer's facility or residence for the duration of time that work is actively in progress. This duration of outage may be longer than it would otherwise have been with an AC disconnect switch. If the Interconnection Customer is a different entity than the electric Clark customer receiving service through the meter that may be used for disconnection or that may have a loss of electric service due to a need to disconnect the Generating Facility, the Interconnection Customer will obtain these agreements and permissions from all other entities affected by such disconnection.

5.1.3.1.3.2. In the absence of an external disconnect switch, the Interconnection Customer is required to operate and maintain the inverter in accordance with the manufacturer's guidelines, annually test the performance of the inverter, and retain documentation demonstrating compliance. Interconnection Customer further agrees that in the absence of such documentation, and at the Interconnection Customer's expense, to allow Clark, at Clark's sole discretion, to test, or cause to be tested, the inverter to ensure its continued operating and protection capability. Should the inverter fail the performance test, Clark may disconnect the Generating Facility without notice, and may require at Interconnection Customer's expense either replacing the inverter or installation of a visible lockable AC disconnect switch as described in Part 5.1.3.1.1, or both, and charge the Interconnection Customer for any reconnection and other Clark costs.

5.1.4. **Tier 1 Interconnection Completion Process.**

The interconnection process is complete, the Generating Facility can begin operation, and the applicant becomes the Interconnection Customer if and only if:

- 5.1.4.1. The Applicant and Clark execute an Interconnection Agreement;
- 5.1.4.2. The Tier 1 or Tier 2 Generator Interconnection Certificate of Completion (see Appendix C) showing inspection of the system by the electrical inspector having jurisdiction over the installation has been provided to Clark;
- 5.1.4.3. All documentation demonstrating compliance with these *Generator Interconnection Requirements* has been provided to Clark;
- 5.1.4.4. The witness test, if required by Clark, is successfully completed; and
- 5.1.4.5. All requirements and conditions of the Interconnection Agreement have been satisfied and approved by Clark



and permission is granted by Clark to proceed with commercial operation.

5.2. **Tier 2 Generator.**

5.2.1. **Tier 2 Applicability.**

Interconnection of a Generating Facility will utilize Tier 2 processes and technical requirements if the proposed Generating Facility meets all of the following:

- 5.2.1.1. Is a Customer-Owned Generator;
- 5.2.1.2. It does not qualify for Tier 1 Interconnection applicability requirements;
- 5.2.1.3. Has a Nameplate Rating of 500 kW or less;
- 5.2.1.4. Is proposed for interconnection to either a radial distribution circuit, or to a Spot Network Distribution System limited to serving one customer;
- 5.2.1.5. Is proposed for interconnection to an electric system distribution facility operated at or below 38 kV class;
- 5.2.1.6. If an inverter is utilized, the inverter must be UL listed under UL1741, certified to meet UL 1741SB performance requirements and meet the requirements of IEEE 1547-2018;
- 5.2.1.7. Is not a synchronous generator;
- 5.2.1.8. If it is proposed to be interconnected on a shared secondary, the aggregate generating capacity on the shared secondary, including the proposed Generating Facility, will not exceed the lesser of the service wire capability or the Nameplate Rating of the transformer;
- 5.2.1.9. If single-phase and is to be interconnected on a center tap neutral of a 240-volt service, its addition will not create an imbalance between the two sides of the 240-volt service of more than 5 kVA;
- 5.2.1.10. The aggregated Nameplate Rating of all interconnected generating facilities, including that of the proposed Generating Facility, on any line section does not exceed 15% of the line section annual peak load as most recently measured or calculated for that line section, or 15% of the circuit annual peak load as most recently measured or calculated for the circuit. A line section is that portion of Clark's Electric System connected to the Generating Facility and bounded by Automatic Sectionalizing Devices or the end of the distribution line;

- 5.2.1.11. Any upgrades required to Clark's Electric System must fall within Part 5.2.3.1 of the Tier 2 Technical Requirements Section;
- 5.2.1.12. For interconnection of a proposed Generating Facility to the load side of Spot Network Distribution System protectors, the proposed Generating Facility must utilize an inverter-based equipment package which is UL listed under UL174, certified to meet UL 1741SB performance requirements and meet the requirements of IEEE 1547-2018. The facility, together with the aggregated other inverter-based generating facilities, will not exceed the smaller of 5% of a Spot Network Distribution System's maximum load or 50 kW;
- 5.2.1.13. The aggregated Nameplate Rating of existing and proposed Generating Facilities must not contribute more than 10% to the distribution circuit's maximum fault current at the point on the primary voltage distribution line nearest the Point of Delivery;
- 5.2.1.14. The Generating Facility's Point of Delivery must not be on a circuit where the available short circuit current, with or without the proposed Generating Facility, exceeds 87.5% of the interrupting capability of Clark's protective devices and equipment (including substation breakers, fuse cutouts, and line reclosers);
- 5.2.1.15. If the Generating Facility is proposed for interconnection at primary (>600 V class) distribution voltages, the connection of the transformer(s) used to connect the Generating Facility to the system must be Clark's standard connection. This is intended to limit the potential for creating over-voltages on Clark's Distribution System for a loss of ground during the operating time of any anti-islanding functions.
  - 5.2.1.15.1. For primary-voltage connections to three-phase, three-wire systems, the transformer primary windings must be connected phase to phase.
  - 5.2.1.15.2. For primary-voltage connections to three-phase, four-wire systems, the transformer primary windings must be connected effectively grounded, phase to neutral.
- 5.2.1.16.



5.2.2. **Tier 2 Application Process.**

The following Application timelines are intended to be consistent with, and not cause delays in other service request applications of Clark.

- 5.2.2.1. Applicants for a Customer-Owned Generator Interconnection will make a determination of the generator categorization (Tier 1, Tier 2 or Tier 3) using the Process Flowchart shown in Appendix A.
  - 5.2.2.1.1. Based on the review of the requested Generating Facility, Clark may alter the categorization determined by an Applicant and apply the applicable Application and technical requirements.
- 5.2.2.2. Applicants will complete the Tier 1 or Tier 2 Generator Interconnection Application shown in Appendix B.
- 5.2.2.3. Response to Application completeness or incompleteness with identified areas of deficiency will be provided to Applicant within 20 Business Days of notice of receipt of Application.
- 5.2.2.4. When an incomplete Application notice is sent to an Applicant, the Applicant will provide a complete Application to Clark within 60 Business Days of the notice of incomplete Application. Clark may, but is not required to grant an extension beyond the 60 Business Day notice of an incomplete Application. Absent a response by the Applicant to complete the Application, an Application expires at the end of the incomplete Application period.
- 5.2.2.5. Within 30 Business Days after a complete Application notice is sent to an Applicant, Clark will make its best effort approve, approve with conditions, or deny the Application with written justification. If delays will result due to unforeseen circumstances, customer variance requests, Balancing Authority or transmission provider approvals, or incentive program approval requirements, the Applicant will be notified.
- 5.2.2.6. An Applicant has one year from the date of approval of the Application to interconnect and begin operation of the Generating Facility, or the Application expires, unless extended by Clark in writing at Clark's discretion. An Application automatically expires on the one-year anniversary date of approval.

5.2.2.7. An Applicant with nameplate ratings larger than 199kW may be required to enter into a BPA Small Generator Interconnection Agreement. Applicant is responsible for all fees and improvements required for the Generating Facility to be connected to Clark's system.

5.2.3. **Tier 2 Technical Requirements.**

In all cases, the interconnection facilities must isolate the Generating Facility from Clark's Electric System when power is disconnected from its Electric System source, including but not limited to, before any reclosing (automatic or manual) takes place. The Interconnection Customer will prevent its Generating Facility equipment from automatically re-energizing the Electric System. For inverter-based systems, this requirement is satisfied by compliance with UL 1741 and 1741SB performance requirements. For non-inverter based systems a separate protection package will be required to meet IEEE 1547-2018 requirements.

5.2.3.1. If the Generating Facility fails to meet the characteristics for Tier 2 applicability, but Clark determines that the Generating Facility could be interconnected safely if minor modifications to the Transmission or Distribution System were made (for example, changing meters, fuses, or relay settings), then Clark may offer the applicant a good-faith, non-binding estimate of the costs of such proposed minor modifications. Modifications are not considered minor under this Part if the total cost of the modifications exceeds \$10,000. If the Applicant authorizes Clark to proceed with the minor modifications and agrees to pay the entire cost of the modifications, then Clark may approve the Application using Tier 2 processes and technical requirements.

5.2.3.2. For proposed generating facilities 50 kW and greater, three-phase connection is required.

5.2.3.3. No construction of facilities by Clark on its own system will be required to accommodate the Tier 2 Generating Facility except as allowed in Part 5.2.3.1.

5.2.3.4. For three-phase induction generator interconnections, Clark may, in its sole discretion, specify that ground fault protection must be provided. Use of ground overvoltage or ground overcurrent elements may be specified, depending

on whether Clark uses three-wire or effectively grounded four-wire systems.

- 5.2.3.5. The Interconnection Customer is required to operate and maintain the inverter in accordance with the manufacturer's guidelines, annually test the performance of the inverter, and retain documentation demonstrating compliance. Interconnection Customer further agrees that in the absence of such documentation, and at the Interconnection Customer's expense, to allow Clark, at Clark's sole discretion, to test, or cause to be tested, the inverter to ensure its continued operating and protection capability. Should the inverter fail the performance test, Clark may disconnect the Generating Facility without notice, and may require either replacing the inverter or installation of a visible lockable AC disconnect switch accessible to Clark personnel, or both, and charge the Interconnection Customer for any reconnection and other Clark costs.
- 5.2.3.6. All inverters shall operate on the constant power factor mode with unity power factor setting unless otherwise specified by Clark due to operation or system limitations. Real power output of the Generating Facility may be affected when the inverter is not operating with unity power factor.
- 5.2.3.7. Visible lockable disconnect
  - 5.2.3.7.1. The Generating Facility must include a UL listed AC disconnect switch, accessible to Clark personnel at any time of the day, that provides a visible break, is lockable in the open position, and is located near the production meter of the Generating Facility.
  - 5.2.3.7.2. Clark will have the right to disconnect the Generating Facility at the disconnect switch to meet Clark operating safety requirements.
  - 5.2.3.7.3. The Interconnection Customer is required to test and maintain the inverter in accordance with the manufacturer's guidelines and retain documentation demonstrating compliance. Interconnection Customer further agrees that in the absence of such documentation, and at the Interconnection

Customer's expense to allow Clark, at Clark's sole discretion, to test, or cause to be tested, and certify the inverter, to ensure its continued operating and protection capability. Should the inverter not be certified by Clark, Clark may disconnect the Generating Facility without notice, may require, at the Interconnection Customer expense either replacing the inverter or installation of a visible lockable AC disconnect switch as described in Part 5.2.3.6, or both, and charge the Interconnection Customer for any reconnection and other Clark costs.

5.2.4. **Tier 2 Interconnection Completion Process.**

The interconnection process is complete, the Generating Facility can begin operation, and the Applicant becomes an Interconnection Customer, if, and only if:

- 5.2.4.1. The Applicant and Clark execute an Interconnection Agreement;
- 5.2.4.2. The Tier 1 or Tier 2 Generator Interconnection Certificate of Completion (see Appendix C) showing inspection of the system by the electrical inspector having jurisdiction over the installation has been provided to Clark;
- 5.2.4.3. All documentation demonstrating compliance with these *Generator Interconnection Requirements* has been provided to Clark;
- 5.2.4.4. All required agreements with the Balancing Authority having jurisdiction, and all agreements covering the purchase, sale or transport of electricity and provision of any ancillary services have been completed and signed by all parties;
- 5.2.4.5. The witness test, if required by Clark, is successfully completed; and
- 5.2.4.6. All requirements and conditions of the Interconnection Agreement have been satisfied and approved by Clark with permission granted by Clark to proceed with commercial operation.

5.3. **Tier 3 and Other Generator.**

The Tier 3 and Other Generator Application, approval and completion processes and technical requirements are necessarily different from Tiers 1 and 2 due to the unique and more complex characteristics of these



generating facilities and associated interconnection requirements. Neither the Applicant nor Clark should expect streamlining or certainty in the timelines associated with these processes, but both should expect to apply due diligence and good faith in arriving at interconnection approval.

5.3.1. **Tier 3 and Other Generator Applicability.**

Interconnection of a Generating Facility will utilize the Tier 3 and Other Generator processes and technical requirements if the proposed Generating Facility meets any of the following:

5.3.1.1. A Tier 3 Generator. A Customer-Owned Generator that:

5.3.1.1.1. Does not qualify for Tier 1 or Tier 2 Interconnection applicability requirements; and

5.3.1.1.2. Has a Nameplate Rating of 20 MW or less.

5.3.1.2. Electric Generating Facilities not owned by electric retail customers of Clark with a generating capacity Nameplate Rating of 20 MW or less;

5.3.1.3. Any electric Generating Facility (regardless of ownership) proposed to be interconnected to Clark's Electric System that has a Nameplate Rating greater than 20 MW.

5.3.1.4. Any Generating Facility (regardless of ownership) that meets the definition of a BES Facility as established by NERC.

5.3.1.5. Any modification to an existing Tier 1 or Tier 2 Interconnection that would result in the Interconnection no longer meeting the Tier 1 or Tier 2 applicability.

5.3.1.6. Any qualified change, as defined by the Planning Coordinator (Bonneville Power Administration), to an existing Tier 3 Interconnection. Such a modification shall include but shall not be limited to:

5.3.1.6.1. A change in the Nameplate Rating,

5.3.1.6.2. A modification that results in a change to the protection systems at the generator or any BES facility, or

5.3.1.6.3. Any other proposed change that is considered by Clark to be a qualified change based on engineering judgment.

5.3.2. **Tier 3 and Other Generator Application Process.**

The following Application timelines are intended to be consistent with, and not cause delays in other service request applications of Clark.

- 5.3.2.1. Applicants for a Customer-Owned Generator Interconnection will make a determination of the generator categorization (Tier 1, Tier 2 or Tier 3) using the Process Flowchart shown in Appendix A.
  - 5.3.2.1.1. Based on the review of the requested Generating Facility, Clark may alter the categorization determined by an Applicant and apply the applicable Application and technical requirements.
- 5.3.2.2. Applicants will complete the Tier 3 and Other Generator Interconnection Application shown in Appendix D.
- 5.3.2.3. Response to Application completeness or incompleteness with identified areas of deficiency will be provided to Applicant within 20 Business Days of receipt of Application.
- 5.3.2.4. When an incomplete Application notice is sent to an Applicant, the Applicant will provide a complete Application to Clark within 60 Business Days of the notice of incomplete Application. Clark may, but is not required to grant an extension beyond the 60 Business Days after the incomplete Application notification is provided. Absent the full completion of the Application by the Applicant, an Application expires at the end of the incomplete Application notification period (60 Business Days). Within 20 Business Days of completion, Clark will provide a complete Application notice to the Applicant.
- 5.3.2.5. Within 30 Business Days after a complete Application notice is sent to an Applicant, Clark will arrange for a scoping meeting to be held to fully discuss the request and all aspects of the proposed interconnection including additionally required information not provided in the initial request. A System Impact Study Agreement will follow which will require a deposit of the estimated study costs.
- 5.3.2.6. An Applicant with nameplate ratings larger than 199kW may be required to enter into a Bonneville Power Administration Small Generator Interconnection Agreement, while nameplates greater than 20MW will require a Larger Generator Interconnection Agreement. Applicant is responsible for all fees and improvements required for the Generating Facility to be connected to Clark's system.

5.3.3. **Tier 3 and Other Generator Technical Requirements.**

The interconnection approval process for the proposed Generating Facility interconnection must accommodate coordinated joint studies and system modification arrangements with Affected Interconnecting Entities. Clark will coordinate its own planning process and interconnection studies and agreements with those of any Affected Interconnecting Entities and will cooperate in any joint studies that are determined to be required. Clark will use its best efforts to accommodate the interconnection planning and study processes that are in effect for Affected Interconnecting Entities in accordance with those entities' NERC Standards FAC-001 and FAC-002 compliance documents and/or transmission tariffs. Depending upon the type and scope of the interconnection request, interconnection studies performed by either Clark or Affected Interconnecting Entities will need to be reviewed and endorsed by Clark and the Affected Interconnecting Entities. Interconnection studies and arrangements will be based on the following:

- 5.3.3.1. Studies, assessments, plans, and agreements will be conducted and documented in order to determine the magnitude of any adverse impacts caused by a requested Generating Facility Interconnection and to implement measures for mitigating such impacts. Interconnection requirements to be addressed will include those technical requirements described in the Tier 3 and Other Generator Technical Requirements attached as Appendix E hereto.
- 5.3.3.2. Adverse impacts will be solely related to the connection of the generator to Clark's Electric System and will not include any system impacts related to the transmission or disposition of the output from any generator (either on Clark's Electric System or the electric systems of any Affected Interconnecting Entities).
- 5.3.3.3. System Impact Study Agreement. An agreement between the Applicant and Clark for the completion of a System Impact Study and for the reimbursement to Clark for all of its costs associated with completion of a System Impact Study.
- 5.3.3.4. System Impact Study. System Impact Studies will be performed to identify impacts, deficiencies, available capacity, operational problems or interconnection facility concerns on the existing Electric System and to evaluate



potential solutions. A proposed Generating Facility Interconnection must not degrade the reliability, operating flexibility, or system performance of Clark’s Electric System or the electric systems of Affected Interconnecting Entities. The proposed interconnection must comply with all applicable NERC and WECC reliability standards and planning criteria. Clark will either conduct its own System Impact Study or participate in and review System Impact Studies prepared by an Affected Interconnecting Entity that is required to evaluate the impact of a proposed interconnection on the reliability and operability of its transmission system. These studies can require considerable time and effort, depending on the size of the Generating Facility and its potential system impacts. Any costs to conduct or review System Impact Studies (including those costs associated with Affected Interconnecting Entity conducted studies) are the responsibility of the Applicant. Evaluation of alternatives to the proposed interconnection, such as lower voltage construction, alternative interconnection points, reactive support facilities, or upgraded facilities, may be requested. Powerflow analysis may require 10-year load and resource growth projections and the planned facilities needed to satisfy all long term transmission service requirements. A System Impact Study will include some or all of the requirements and types of studies listed in Appendix E – Tier 3 and Other Generator Technical Requirements.

5.3.3.5. Interconnection Facility Study Agreement. An agreement between the Applicant and Clark for the completion of an Interconnection Facility Study and for the reimbursement to Clark for all of its costs associated with completion of an Interconnection Facility Study.

5.3.3.6. Interconnection Facility Study. If the System Impact Studies indicate that additions or upgrades to the existing transmission system are necessary due to the Interconnection of the Generating Facility, Clark will conduct, or participate in, or review an Interconnection Facilities Study, at the expense of the Applicant, to determine the estimated cost of additions or upgrades and

the estimated time frame for implementing system additions or upgrades to Clark’s Electric System and the electric systems of Affected Interconnecting Entities.

- 5.3.3.7. Interconnection Facilities Agreement. An agreement between the Applicant and Clark for the installation of system upgrades (on Clark’s Electric System as well as the electric systems of Affected Interconnecting Entities) necessary to mitigate adverse impacts on the electric system and for the reimbursement to Clark for all of its costs associated with installation of system upgrades.
- 5.3.3.8. Interconnection Agreement. A long term agreement between the Applicant and Clark, providing for, among other things the operation of the Generating Facility Interconnection and the commercial operation of the generator.
- 5.3.3.9. Transmission Agreements and Power Purchase Agreements. Agreements between the Applicant and Clark or other parties providing for the transmission and disposition of the output of a Generating Facility. The obligations and the services thereunder are not within the scope of Clark’s *Generator Interconnection Requirements*. The Applicant shall be responsible for arranging for the transmission and disposition of the output of a Generating Facility and providing evidence to Clark that such arrangements have been completed.
- 5.3.3.10. All inverters shall operate on the constant power factor mode with unity power factor setting unless otherwise specified by Clark due to operation or system limitations. Real power output of the Generating Facility may be affected when the inverter is not operating with unity power factor.

5.3.4. **Tier 3 and Other Generator Interconnection Completion Process.**

The interconnection process is complete, the Generating Facility can begin operation, and the applicant becomes an Interconnection Customer, when an Interconnection Agreement is fully executed as detailed below:

- 5.3.4.1. Within 30 Business Days after a completed Application notice is sent to an Applicant, Clark will arrange for a scoping meeting to be held to fully discuss the request

and all aspects of the proposed interconnection including additionally required information not provided in the initial request.

- 5.3.4.2. Within 20 Business Days after the scoping meeting a System Impact Study Agreement will be sent to the Applicant which will require a deposit of the estimated study costs.
- 5.3.4.3. Within 20 Business Days after receipt, the Applicant will provide Clark with a signed copy of the System Impact Study Agreement and the required deposit. Clark may, but is not required to grant an extension beyond 20 Business Days after the System Impact Study Agreement is provided. Absent the provision of a signed copy of the System Impact Study Agreement and the deposit to Clark, an Application expires at the end of the System Impact Study Agreement period (20 Business days).
- 5.3.4.4. Upon receipt of a signed copy of the System Impact Study Agreement Clark will (1) sign and provide a fully executed copy of the System Impact Study Agreement to the Applicant and (2) proceed with the completion of the studies. The information regarding the Generating Facility Interconnection will be submitted to any Affected Interconnecting Entities as determined by Clark. Clark will take whatever steps are available to preserve the confidentiality of such information except when required to publicly disclose information by a regulatory agency having jurisdictional authority over Clark.
  - 5.3.4.4.1. The System Impact Study will be performed (totally or partially) by Clark, Affected Interconnecting Entities, or both as provided for in Part 5.3.3 herein.
  - 5.3.4.4.2. The Applicant will be responsible for all costs of the System Impact Study whether performed by Clark or by any Affected Interconnecting Entities.
  - 5.3.4.4.3. Upon conclusion of all aspects of the System Impact Study process, Clark will arrange for a System Impact Study meeting to be held to fully discuss the results of the studies. This meeting will include the Applicant, Clark, and any Affected Interconnecting Entities. Such meeting will include a

written report detailing the results of the studies as provided for in Part 5.3.3 herein.

- 5.3.4.5. Within 20 Business Days after the System Impact Study meeting, the Applicant will provide notification to Clark to proceed with the further required steps for approving the interconnection. Clark may, but is not required to grant an extension beyond 20 Business Days after the System Impact Study meeting occurs. Absent a notice to proceed from the Applicant to Clark, an Application expires at the end of the System Impact Study meeting period (20 Business days).
- 5.3.4.6. Within 20 Business Days of a notification from the Applicant to Clark to proceed with the further required steps for approving the interconnection, Clark will provide a copy of an Interconnection Facilities Study Agreement as provided for in Part 5.3.3 herein to the Applicant which will require a deposit of the estimated study costs and will forward the Applicants notification to any Affected Interconnecting Entities.
- 5.3.4.7. Within 20 Business Days after receipt, the Applicant will provide Clark with a signed copy of the Interconnection Facilities Study Agreement and the required deposit. Clark may, but is not required to grant an extension beyond 20 Business Days after the Interconnection Facilities Study Agreement is provided. Absent the provision of a signed copy of the Interconnection Facilities Study Agreement and the deposit to Clark, an Application expires at the end of the Interconnection Facilities Study Agreement period (20 Business days).
- 5.3.4.8. Upon receipt of a signed copy of the Interconnection Facilities Study Agreement Clark will (1) sign and provide a fully executed copy of the Interconnection Facilities Study Agreement to the Applicant and (2) proceed with the completion of the studies. The information regarding the Generating Facility Interconnection will be submitted to any Affected Interconnecting Entities as determined by Clark. Clark will take whatever steps are available to preserve the confidentiality of such information except when required to publicly disclose information by a

regulatory agency having jurisdictional authority over Clark.

- 5.3.4.8.1. The Interconnection Facilities Study will be performed (totally or partially) by Clark, Affected Interconnecting Entities, or both as provided for in Part 5.3.3 herein.
- 5.3.4.8.2. The Applicant will be responsible for all costs of the Interconnection Facilities Study whether performed by Clark or by any Affected Interconnecting Entities.
- 5.3.4.8.3. The Applicant may be required by Affected Interconnecting Entities to agree to separate interconnection facility study arrangements. If so, those arrangements will be between the Applicant and the Affected Interconnecting Entity.
- 5.3.4.8.4. Upon conclusion of all aspects of the Interconnection Facilities Study process, Clark will arrange for an Interconnection Facilities Study meeting to be held to fully discuss the results of the studies. This meeting will include the Applicant, Clark, and any Affected Interconnecting Entities. Such meeting will include a written report detailing the results of the studies as provided for in Part 5.3.3 herein.
- 5.3.4.9. Within 20 Business Days after the Interconnection Facilities Study meeting, the Applicant will provide notification to Clark to proceed with the further required steps for approving the interconnection. Clark may, but is not required to grant an extension beyond 20 Business Days after the Interconnection Facilities Study meeting occurs. Absent a notice to proceed from the Applicant to Clark, an Application expires at the end of the Interconnection Facilities Study meeting period (20 Business days).
- 5.3.4.10. A Within 20 Business Days of a notification from the Applicant to Clark to proceed with the further required steps for approving the interconnection, Clark will provide a copy of an Interconnection Facilities Agreement as provided for in Part 5.3.3 herein to the Applicant which will require a deposit and periodic payments of the estimated

facility costs and will forward the Applicants notification to any Affected Interconnecting Entities.

- 5.3.4.11. Within 30 Business Days after receipt, the Applicant will provide Clark with a signed copy of the Interconnection Facilities Agreement and the required deposit. Clark may, but is not required to grant an extension beyond 30 Business Days after the Interconnection Facilities Agreement is provided. Absent the provision of a signed copy of the Interconnection Facilities Agreement and the deposit to Clark, an Application expires at the end of the Interconnection Facilities Agreement period (30 Business days).
- 5.3.4.12. Upon receipt of a signed copy of the Interconnection Facilities Agreement Clark will (1) sign and provide a fully executed copy of the Interconnection Facilities Agreement to the Applicant and (2) implement the Interconnection Facilities Agreement upgrades. The information regarding the Generating Facility Interconnection will be submitted to any Affected Interconnecting Entities as determined by Clark. Clark will take whatever steps are available to preserve the confidentiality of such information except when required to publicly disclose information by a regulatory agency having jurisdictional authority over Clark.
  - 5.3.4.12.1. The Interconnection Facilities Agreement upgrades will be completed by Clark, Affected Interconnecting Entities, or both as provided for in Part 5.3.3 herein.
  - 5.3.4.12.2. The Applicant will be responsible for all costs of the Interconnection Facilities Agreement upgrades whether performed by Clark or by any Affected Interconnecting Entities.
  - 5.3.4.12.3. The Applicant may be required by Affected Interconnecting Entities to agree to separate interconnection facility system upgrade arrangements. If so, those arrangements will be between the Applicant and the Affected Interconnecting Entity.
- 5.3.4.13. At approximately 60 Business Days prior to the estimated completion of the Interconnection Facilities Agreement upgrades, Clark will provide a copy of a draft

Interconnection Agreement as provided for in Part 5.3.3 herein to the Applicant and will arrange for a final meeting to be held to fully discuss the Interconnection. This meeting will include the Applicant, Clark, and any Affected Interconnecting Entities.

- 5.3.4.14. Within 10 Business Days after the actual completion of the Interconnection Facilities Agreement upgrades including any final payment, Clark will provide a copy of a final Interconnection Agreement as provided for in Part 5.3.3 herein to the Applicant.
- 5.3.4.15. Within 10 Business Days after receipt, the Applicant will provide Clark with (1) a signed copy of the final Interconnection Agreement, (2) evidence that any necessary agreements between the Applicant and Affected Interconnecting Entities have been executed and that all obligations have been completed, and (3) evidence that all arrangements covering the transmission and disposition of the output of a Generating Facility have been completed.
- 5.3.4.16. Within 10 Business Days of receipt of (1) a signed copy of the final Interconnection Agreement, (2) evidence that any necessary agreements between the Applicant and Affected Interconnecting Entities have been executed and that all obligations have been completed, and (3) evidence that all arrangements covering the transmission and disposition of the output of a Generating Facility have been completed, Clark will provide the Applicant with a fully executed copy of the Interconnection Agreement.
- 5.3.4.17. Commercial operation of the Tier 3 or Other Generator may commence as provided for in the fully executed Interconnection Agreement.

## **6. GENERAL TERMS, CONDITIONS AND TECHNICAL REQUIREMENTS**

The terms, conditions, and technical requirements in this Part will apply to the applicant and Interconnection Customer and their Generating Facility throughout the Generating Facility's installation, testing, commissioning, operation, maintenance, decommissioning and removal. Clark may verify compliance at any time, with reasonable notice. Any Generating Facility proposing to be interconnected with Clark's Electric System or any proposed change to a Generating Facility that requires modification of an existing Interconnection Agreement must meet all applicable terms, conditions and technical requirements



as set forth in the appropriate generator classification of these *Generator Interconnection Requirements* and the regulations and standards adopted by reference in Part 7. The terms, conditions and technical requirements in this Part are intended to mitigate possible adverse impacts caused by the Generating Facility on Clark equipment and personnel, on other customers of Clark, and on neighboring transmission owner equipment, personnel, and customers. They are not intended to address protection of the Generating Facility itself, Generating Facility personnel, or its internal load. It is the responsibility of the Generating Facility to comply with the requirements of all appropriate standards, codes, statutes and authorities to protect its own facilities, personnel, and loads.

6.1. **Terms and Conditions.**

6.1.1. The Applicant and Interconnection Customer will comply with and are responsible for the Generating Facility meeting the requirements in Parts 6.1.1.1, 6.1.1.2, and 6.1.1.3. However, at its sole discretion, Clark may approve, in writing, alternatives that satisfy the intent of, and/or may excuse compliance with, any specific elements of these requirements except local, state and federal building codes.

6.1.1.1. **Codes and Standards.** Among these are the National Electric Code (NEC), National Electric Safety Code (NESC), the Institute of Electrical and Electronics Engineers (IEEE), American National Standards Institute (ANSI), and Underwriters Laboratories (UL) standards, and local, state and federal building codes. The Interconnection Customer will be responsible for obtaining all applicable permit(s) for the equipment installations on its property.

6.1.1.2. **Safety.** All safety and operating procedures for joint use equipment will be in compliance with the Occupational Safety and Health Administration (OSHA) Standard at 29 CFR 1910.269, the NEC, Washington Administrative Code (WAC) rules, the Washington Division of Occupational Safety and Health (DOSH) Standard, and equipment manufacturer's safety and operating manuals.

6.1.1.3. **Power Quality.** Installations will be in compliance with all applicable standards including IEEE Standard 519 Harmonic Limits, or more stringent harmonic requirements of Clark.

6.1.2. Any electrical Generating Facility must comply with these rules to be eligible to interconnect and Operate in Parallel with Clark's Electric System. These specifications and standards will apply to all

interconnecting Generating Facilities that are intended to Operate in Parallel with Clark's Electric System irrespective of whether the applicant intends to generate energy to serve all or a part of the applicant's load; or to sell the output to Clark or any third party purchaser.

- 6.1.3. In order to ensure system safety and reliability of interconnected operations, all interconnected Generating Facilities will be constructed, operated and maintained by the Interconnection Customer in accordance with these rules, with the Interconnection Agreement, with the applicable manufacturer's recommended maintenance schedule and operating requirements, good Clark practice, applicable NERC and WECC reliability standards, and all other applicable federal, state, and local laws and regulations.
- 6.1.4. Prior to Initial Operation all Tier 1 and Tier 2 Generators, Interconnection Customers must submit a signed Certificate of Completion to Clark, and execute an appropriate Interconnection Agreement with Clark. The Interconnection Agreement between Clark and Interconnection Customer outlines the interconnection standards, cost allocation and billing agreements, insurance requirements, and on-going maintenance and operation requirements.
- 6.1.5. Prior to Initial Operation all Tier 3 and Other Generators, Clark and the Interconnection Customers must be parties to a fully executed Interconnection Agreement. The Interconnection Agreement between Clark and Interconnection Customer outlines the interconnection standards, cost allocation and billing agreements, insurance requirements, and on-going maintenance and operation requirements.
- 6.1.6. Separate agreements may be required with Clark, the Balancing Area Authority or transmission provider, or any other party but not necessarily with Clark, for power purchase, for the sale, delivery and scheduling of output from the Generating Facility, for integration or other ancillary services. All required agreements must also be executed prior to Initial Operation.
- 6.1.7. Applicant or Interconnection Customer will promptly furnish Clark with copies of such plans, specifications, records, and other information relating to the Generating Facility or the ownership, operation, use, or maintenance of the Generating Facility, as may be reasonably requested by Clark from time to time.

- 6.1.8. For the purposes of public and working personnel safety, any non-approved Generating Facility Interconnections discovered will be immediately disconnected from Clark system without any liability to Clark. Such disconnection of non-approved interconnection may result in disconnection of electric service to customers of a Clark other than the owner of the Generating Facility.
- 6.1.9. To ensure reliable service to all Clark customers and to minimize possible problems for other customers, Clark will review the need for upgrades to its system, including a dedicated transformer. If Clark requires upgrades, the applicant or Interconnection Customer will pay for all costs of those upgrades.
- 6.1.10. When applicable, Clark may require, and will provide the reasoning in writing, a transfer trip system or an equivalent protective function for a Generating Facility, that cannot: 1. Detect Distribution System faults (both line-to-line and line-to-ground) and clear such faults within two seconds; or 2. Detect the formation of an unintended island and cease to energize Clark's Distribution System within two seconds.
- 6.1.11. Production metering. Clark requires separate metering for production. This meter will record all generation produced and may be billed separately from any customer usage metering. All costs associated with the installation of production metering will be paid by the Applicant.
- 6.1.12. Common labeling, at Interconnection Customer's expense, furnished or approved by Clark and in accordance with Clark and NEC requirements must be posted on meter base, disconnects, and transformers informing working personnel that a Generating Facility is operating at or is located on the premises.
- 6.1.13. For Generating Facilities permitted under these *Generator Interconnection Requirements*, additional insurance, limitations of liability and indemnification may be required by Clark.
- 6.1.14. Prior to any future modification or expansion of the Generating Facility, the Interconnection Customer will obtain Clark's review and approval. Clark reserves the right to require the Interconnection Customer, at the Interconnection Customer's expense, to provide corrections or additions to existing electrical devices in the event of modification of government or industry regulations and standards, or major changes in Clark's Electric System which impacts the Interconnection.

- 6.1.15. Charges by Clark to the Applicant or Interconnection Customer in addition to the Application fee, if any, will be compensatory and applied as appropriate. Such costs may include, but are not limited to, transformers, production meters, and Clark testing, qualification, studies and approval of non-UL 1741 listed equipment. The Interconnection Customer will be responsible for any costs associated with any future upgrade or modification to its interconnected system required by modifications in Clark's Electric System.
- 6.1.16. This Part does not govern the settlement, purchase, sale or delivery of any power generated by Applicant's Generating Facility. The purchase, sale or delivery of power and other services that the applicant may require will be covered by separate agreement or pursuant to the terms, conditions and rates as may be from time to time approved by Clark's Board of Commissioners. Any such agreement will be completed prior to Initial Operation.
- 6.1.17. Interconnection Customer may disconnect a Generating Facility that is less than 20 MW at any time; provided that the Interconnection Customer provides reasonable advance notice to Clark. Generators that are 20 MW or more will be required to arrange for planned or unplanned outages in accordance with any NERC standards that are applicable to the generator.
- 6.1.18. Interconnection Customer will notify Clark prior to the sale or transfer of the Generating Facility, the Interconnection facilities or the premises upon which the facilities are located. The Applicant or Interconnection Customer will not assign its rights or obligations under any agreement entered into pursuant to these rules without the prior written consent of Clark, which consent will not be unreasonably withheld.
- 6.1.19. All Tier 1 and Tier 2 Generating Facilities must have an electrical permit and pass electrical inspection before they can be connected or Operated in Parallel with Clark's Electric System. Applicant will provide written certification to Clark that the Generating Facility has been installed and inspected in compliance with the local building and/or electrical codes.
- 6.1.20. If the Interconnection Customer is a different entity than the owner of the real property on which the Generating Facility is located, the Interconnection Customer will indemnify Clark for all risks to the owner of the real property, including disconnection of service. In addition, the Interconnection Customer will obtain all legal rights and



easements requested by Clark for Clark to access, install, own, maintain, operate or remove its equipment and the disconnect switch, if installed, on the real property where the Generating Facility is located, at no cost to Clark.

- 6.1.21. Tier 3 and Other Generator General Terms, Conditions, and Technical Requirements. All Tier 3 and Other Generator Interconnections are subject to additional general terms, conditions, and technical requirements as specified in Appendix E.

## **7. ADOPTION BY REFERENCE**

In these requirements, Clark adopts by reference all or portions of regulations and standards identified below. The publications and references within these *Generator Interconnection Requirements* are available as follows.

### **7.1. Adopted Regulations and Standards**

- 7.1.1. The National Electrical Code (NEC) is published by the National Fire Protection Association (NFPA).
  - 7.1.1.1. Most recent version adopted by Washington Labor & Industries.
  - 7.1.1.2. **The NEC is a copyrighted document:**  
<https://www.nfpa.org>
- 7.1.2. National Electric Safety Code (NESC)
  - 7.1.2.1. Most recent version.
  - 7.1.2.2. Institute of Electrical and Electronics Engineers (IEEE):  
<https://standards.ieee.org>
- 7.1.3. Institute of Electrical and Electronics Engineers (IEEE) Standard 1547-2018, Standard for Interconnecting Distributed Resources with Electric Power Systems.
  - 7.1.3.1. Most recent version adopted by IEEE.
  - 7.1.3.2. IEEE: <https://standards.ieee.org>
- 7.1.4. American National Standards Institute (ANSI) Standard C37.90, IEEE Standard for Relays and Relay Systems Associated with Electric Power Apparatus.
  - 7.1.4.1. The most recent version.
  - 7.1.4.2. IEEE: <https://standards.ieee.org>
- 7.1.5. Institute of Electrical and Electronics Engineers (IEEE) Standard 519, Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems.
  - 7.1.5.1. Most recent version.
  - 7.1.5.2. Institute of Electrical and Electronics Engineers (IEEE):  
<https://standards.ieee.org>

- 7.1.6. Underwriters Laboratories (UL), including UL Standard 1741 and Supplemental Test Procedures within UL Standard 1741SB, Inverters, Converters, and Controllers for Use in Independent Power Systems.
  - 7.1.6.1. Most recent version.
  - 7.1.6.2. Underwriters Laboratory:  
<https://www.shopulstandards.com>
- 7.1.7. Occupational Safety and Health Administration (OSHA) Standard at 29 CFR 1910.269.
  - 7.1.7.1. U.S. Government Online Bookstore:  
<https://bookstore.gpo.gov>, and from various third-party vendors.
- 7.1.8. Washington Division of Occupational Safety and Health (DOSH) Standard, chapter 296-155 WAC.
  - 7.1.8.1. Washington Department of Labor and Industries:  
<https://www.lni.wa.gov>
- 7.1.9. American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE) Standard C62.92, IEEE guide for the application of neutral grounding in electrical Clark systems.
  - 7.1.9.1. Most recent version.
  - 7.1.9.2. IEEE: <https://standards.ieee.org>
- 7.1.10. Institute of Electrical and Electronics Engineers (IEEE) Standard 1453, IEEE Recommended Practice for Measurement and Limits of Voltage Fluctuations and Associated Light Flicker on AC Power Systems.
  - 7.1.10.1. Most recent version.
  - 7.1.10.2. IEEE: <https://standards.ieee.org>
- 7.1.11. North American Electric Reliability Corporation (NERC) Electric Reliability Standards.
  - 7.1.11.1. Clark adopts the currently effective versions of the following standards.
    - 7.1.11.1.1. FAC-001 Facility Interconnection Requirements.
    - 7.1.11.1.2. FAC-002 Facility Interconnection Studies.
    - 7.1.11.1.3. FAC-008 Facility Ratings.
    - 7.1.11.1.4. MOD-025 Verification and Data Reporting of Generator Real and Reactive Power Capability and Synchronous Condenser Reactive Power Capability.



- 7.1.11.1.5. MOD-026 Verification of Models and Data for Generator Excitation Control System or Plant Volt/Var Control Functions.
- 7.1.11.1.6. MOD-027 Verification of Models and Data for Turbine/Governor and Load Control or Active Power/Frequency Control Functions.
- 7.1.11.1.7. MOD-031 Demand and Energy Data.
- 7.1.11.1.8. MOD-032 Data for Power System Modeling and Analysis.
- 7.1.11.2. NERC Standards: <https://www.nerc.com>
- 7.1.12. Western Electricity Coordinating Council (WECC).
  - 7.1.12.1. Clark adopts the currently effective versions of the following specifications.
    - 7.1.12.1.1. WECC Generating Facility Data, Testing, and Model Validation Requirements.
    - 7.1.12.1.2. WECC Approved Dynamic Model Library
  - 7.1.12.2. WECC Standards: <https://www.wecc.org>

**8. REVISION CONTROL**

Revision Date	Version No.	Revisions
March 7, 2017	1	Original version incorporating interconnection requirements for Tier 1, Tier 2, and Tier 3, and Other Generating Facilities.
October 17, 2018	2	Minor modifications due to Clark no longer functioning as a Transmission Operator and its future NERC registration as a Transmission Planner.
February 1, 2021	3	Minor modifications based on a periodic review of the document and the activation of Clark’s Transmission Planner status.
August 9, 2024	4	“Material modification” clarification to Planning Coordination determination of “qualified change” due to FAC-002-4 implementation. Included BPA generation interconnection process and clarifications for Net Billing applications.





**9. AUTHORIZATION**

These *Generator Interconnection Requirements* have been approved and authorized by Clark’s Manager of Systems Engineering & Planning and Director of Engineering.

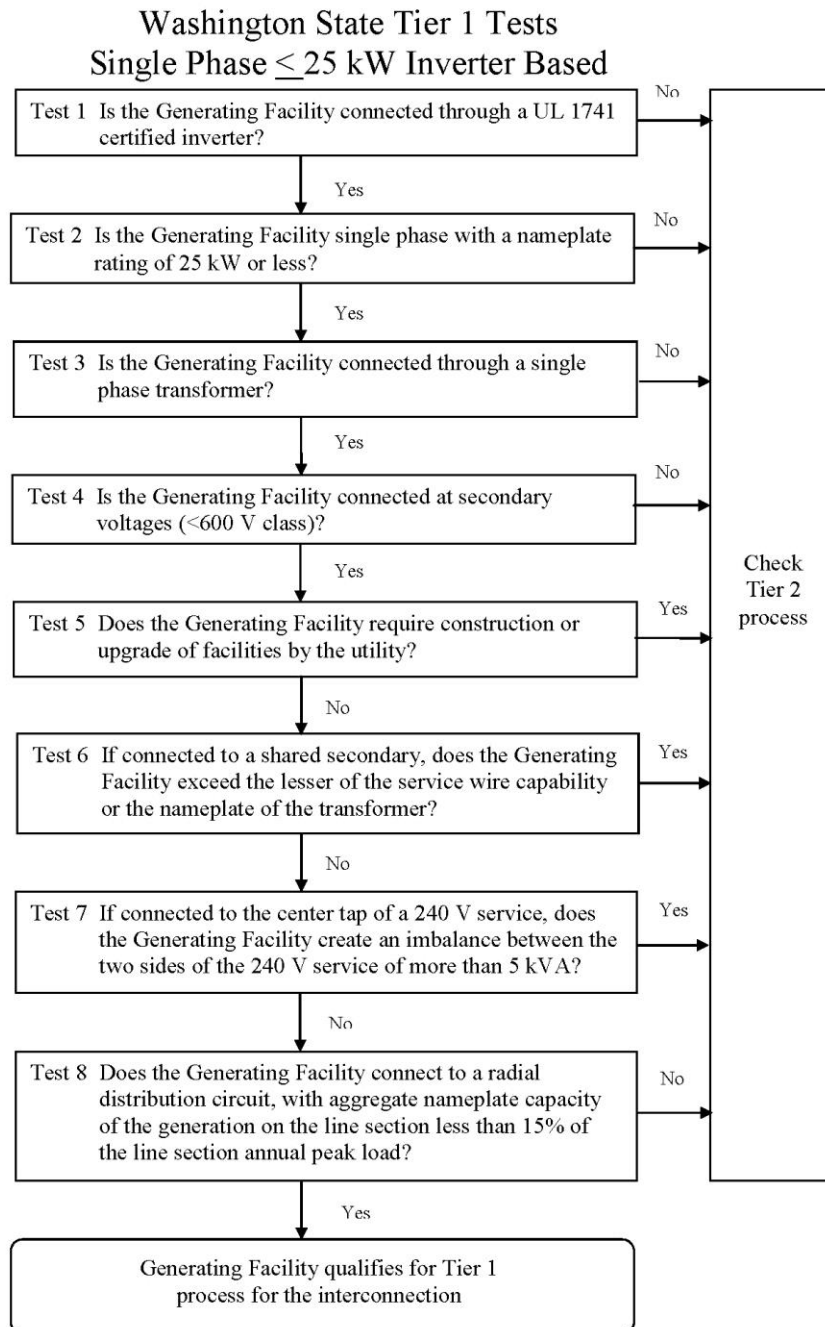
**Document Owner Approval:**

<u>s/Ryan Kerr</u>	<u>8/9/2024</u>
Ryan Kerr, Manager of Systems Engineering & Planning	Date

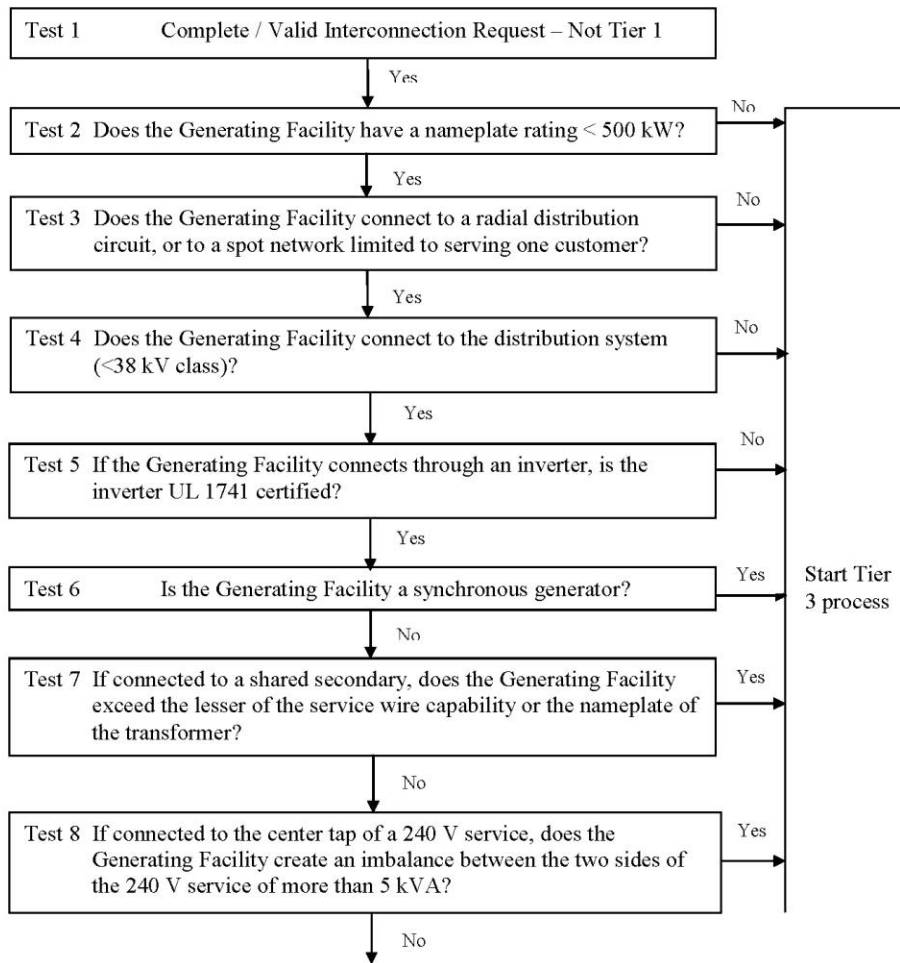
**Director of Engineering:**

<u>s/Cal Morris</u>	<u>8/9/2024</u>
Cal Morris, Director of Engineering	Date

**APPENDIX A – Tier 1, Tier 2, and Tier 3 and Other Generator Process Flowchart**

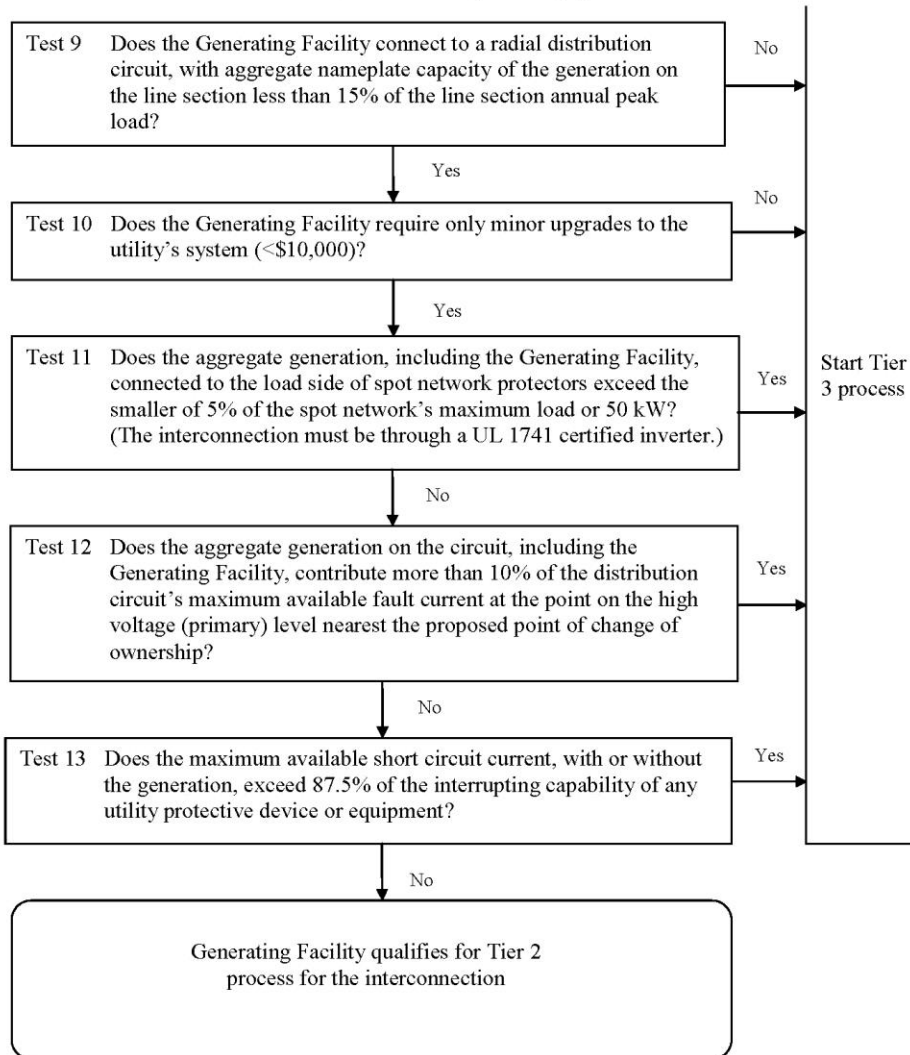


### Washington State Tier 2 Tests < 500 kW Nameplate Rating



Continued next page

### Washington State Tier 2 Tests < 500 kW Nameplate Rating Continued from previous page





**APPENDIX B – Tier 1 or Tier 2 Generator Interconnection Application**

This Application form should be used for requesting interconnection of either Tier 1 generators meeting the Applicability requirements of Part 5.1.1 or Tier 2 generators meeting the Applicability requirements of Part 5.2.1 of Clark Public Utilities’ (Clark’s) *Generator Interconnection Requirements*. Any additional or clarifying information the Applicant believes is needed by Clark in order to approve this Application should be included in an attachment to a completed Application.

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

Clark Notification

All completed Applications should be forwarded to Clark at the following address:

Attn: Energy Resources, Customer Generation  
Clark Public Utilities  
P.O. Box 8900  
Vancouver, WA 98668

Application Processing Fee

A non-refundable processing fee as shown below must accompany this Application:

- \$100 for a Tier 1 generator; or
- \$500 for a Tier 2 generator.

Interconnection Customer

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

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

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

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

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

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



Contact (if different from Interconnection Customer)

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

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

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

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

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

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

Owner of the facility (include % ownership by any electric Clark): \_\_\_\_\_

Billing Information (if different from Interconnection Customer)

Application Fee

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

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

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

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

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

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

Generating Facility Information and system one-line diagram<sup>1,2</sup>

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

Electric Service Company: \_\_\_\_\_ Account Number: \_\_\_\_\_

Prime Mover: Photovoltaic \_\_\_ Reciprocating Engine \_\_\_ Fuel Cell \_\_\_ Turbine \_\_\_

Other (describe) \_\_\_\_\_

Energy Source: Solar \_\_\_ Wind \_\_\_ Hydro \_\_\_ Diesel \_\_\_ Natural Gas \_\_\_ Fuel Oil \_\_\_

Other (describe) \_\_\_\_\_

System Design Capacity: \_\_\_\_\_(kW)<sup>2</sup> \_\_\_\_\_(kVA)

<sup>1</sup> Provide one-line diagram showing the design capacity and equipment nameplate information for each Generating Facility system at the site, as well as Total System Design Capacity

<sup>2</sup> One-line diagrams and supporting documentation must be stamped by a licensed Washington State Professional Engineer for system capacities greater than 199kW



Appendix B  
Tier 1 or Tier 2 Generator Interconnection Application

Generator / Panel Manuf.: \_\_\_\_\_ Model No.: \_\_\_\_\_ Qty: \_\_\_\_\_  
Inverter Manuf.: \_\_\_\_\_ Model No.: \_\_\_\_\_ Qty: \_\_\_\_\_  
Nameplate Rating: \_\_\_\_\_(kW) \_\_\_\_\_(kVA) \_\_\_\_\_(Vac)  
Single-Phase \_\_\_\_\_ Three-Phase \_\_\_\_\_

Is equipment UL1741SB Certified? (Yes/No) \_ If Yes, attach manufacturer's cut-sheet showing listing.





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

Equipment Type	Certifying Entity
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____

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

Interconnection Customer Signature

I hereby certify that, to the best of my knowledge, the information provided in this Application is true. I agree to abide by the Terms and Conditions for Interconnecting a customer-owned Tier 1 or Tier 2 Generator and provide a signed Certificate of Completion when the Tier 1 or Tier 2 Generator has been installed.

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

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

-----  
(For Clark Use Only)

Contingent Approval to Interconnect the Generating Facility

Interconnection of the Generating Facility is approved contingent upon the Terms and Conditions for Interconnecting a customer-owned Tier 1 or Tier 2 Generator no Larger than 500 kW and return of the completed Certificate of Completion.

Clark Representative: \_\_\_\_\_

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

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

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

Electrical permit number, if known: \_\_\_\_\_



**APPENDIX C – Tier 1 or Tier 2 Generator Interconnection Certificate of Completion**

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

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

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

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

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

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

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

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

Electrician: \_\_\_\_\_

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

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

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

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

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

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

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

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



**APPENDIX D – Tier 3 and Other Generator Interconnection Application**

This Application form should be used for requesting interconnection of a generator meeting the Applicability requirements of Part 5.3.1 of Clark Public Utilities’ (Clark’s) *Generator Interconnection Requirements*.

This Application is considered complete when an Applicant provides all applicable and correct information required below. Additional information to evaluate the Application may be required. Any additional or clarifying information the Applicant believes is needed by Clark in order to approve this Application should be included in an attachment to a completed Application.

Clark Notification

All completed Applications should be forwarded to Clark at the following address:

Attn: Energy Resources, Customer Generation  
Clark Public Utilities  
P.O. Box 8900  
Vancouver, WA 98668

Application Processing Fee

A non-refundable processing fee as shown below must accompany this Application:

- \$1,000 for a generator with a Nameplate Rating of 20 MW or less; or
- \$2,000 for a generator with a Nameplate Rating greater than 20 MW.

Interconnection Customer

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

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

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

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

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

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



Contact (if different from Interconnection Customer)

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

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

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

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

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

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

Owners of the facility (include % ownership by any electric Clark): \_\_\_\_\_

\_\_\_\_\_

Billing Information (if different from Interconnection Customer)

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

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

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

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

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

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

Generating Facility Information and system one-line diagram<sup>3,4</sup>

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

Prime Mover: Photovoltaic \_\_\_ Reciprocating Engine \_\_\_ Fuel Cell \_\_\_ Turbine \_\_\_

Other (describe) \_\_\_\_\_

Energy Source: Solar \_\_\_ Wind \_\_\_ Hydro \_\_\_ Diesel \_\_\_ Natural Gas \_\_\_ Fuel Oil \_\_\_

Other (describe) \_\_\_\_\_

System Design Capacity: \_\_\_\_\_(kW)<sup>4</sup> \_\_\_\_\_(kVA)

<sup>3</sup> Provide one-line diagram showing the design capacity and equipment nameplate information for each Generating Facility system at the site, as well as Total System Design Capacity.

<sup>4</sup> One-line diagrams and supporting documentation must be stamped by a licensed Washington State Professional Engineer for system capacities greater than 199kW



Generator / Panel Manuf.: \_\_\_\_\_ Model No.: \_\_\_\_\_ Qty: \_\_\_\_\_  
 Inverter Manuf.: \_\_\_\_\_ Model No.: \_\_\_\_\_ Qty: \_\_\_\_\_  
 Nameplate Rating: \_\_\_\_\_(kW) \_\_\_\_\_(kVA) \_\_\_\_\_(Vac)  
 Single-Phase \_\_\_\_\_ Three-Phase \_\_\_\_\_

Is equipment UL1741SB Certified? (Yes/No) \_ If Yes, attach manufacturer’s testing results.

Will the Generating Facility meet any of the following criteria?

Is the generator customer owned? Yes \_\_\_\_\_ No \_\_\_\_\_

Will the generator supply all or a portion of the Applicant’s load\*? Yes \_\_\_\_\_ No \_\_\_\_\_

\* Retail electric service load for customer owned generators. Not generator station load.



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

Equipment Type	Certifying Entity
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____

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

Additional Tier 3 and Other Generator Information

Generating Facilities with a Nameplate Rating that is greater than 1 MW will provide the Additional Tier 3 and Other Generator Information as specified in Attachment 1 to this Application.

Interconnection Customer Signature

I hereby certify that, to the best of my knowledge, the information provided in this Application is true. I agree to abide by the Terms and Conditions for Interconnecting a Tier 3 and Other Generator.

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

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

-----  
(For Clark Use Only)

Approval to Interconnect the Generating Facility

A request for the interconnection of a Tier 3 and Other Generator to Clark's Electric System will only be approved upon:

1. The conclusion of a System Impact Study, an Interconnection Study, and any other required studies performed by Clark and/or an Affected Interconnecting Entity;
2. The execution of an Interconnection Agreement between the Applicant and Clark adequately addressing the mitigation of adverse system impacts as determined in the System Impact Studies by Clark or any Affected Interconnecting Entity.



1. **Tier 3 and Other Generator Additional Information.** Provide the following information for any Tier 3 and Other Generator with a Nameplate Rating that is greater than 1 MW. Do not leave any data entry lines blank. Enter N/A if not applicable.

a. **Electrical Data.** The following electrical data will be required and will depend on the type of connection requested.

i. **Electrical One-Line Diagrams.** The electrical one-line diagram should include equipment ratings, equipment connections, transformer configuration, generator configuration and grounding, bus, circuit breaker and disconnect switch arrangements, etc. The electrical one-line diagram is required at execution of the System Impact Study agreement and again at execution of the Interconnection Agreement.

ii. **Transformer Data.** If one or more transformers are included as part of the connection request, the following data is needed. If different types of transformers are included, data for each different type of transformer is needed. Transformer data is required at execution of the System Impact Study agreement and again at execution of the Interconnection Agreement.

1. Number and type of transformers (generator step-up, excitation, station service, auxiliary, etc.): \_\_\_\_\_  
\_\_\_\_\_

2. Nameplate Rating for each transformer (base), kVA: \_\_\_\_\_  
\_\_\_\_\_

3. Primary, secondary, and tertiary voltages for each transformer, kV: \_\_\_\_\_  
\_\_\_\_\_

4. Rated impedance at base kVA for each transformer, Z: \_\_\_\_\_  
\_\_\_\_\_

5. Full load and no-load losses for each transformer (include any manufacturer's loss curves, kVA: \_\_\_\_\_  
\_\_\_\_\_

6. Voltage tap changing capabilities for each transformer: \_\_\_\_\_  
\_\_\_\_\_

7. Manufacturer's nameplate data sheet for each transformer: \_\_\_\_\_  
\_\_\_\_\_



iii. **Tier 3 and Other Generator Data**. If one or more generators are included as part of the connection request, the following data is needed. If different types of generators are included, data for each different type of generator is needed. Tier 3 and Other Generator data are required at execution of the System Impact Study agreement and again at execution of the Interconnection Agreement.

1. Energy source (e.g., wind, natural gas, hydro, bio-mass, bio-gas, solar, geothermal, etc.): \_\_\_\_\_  
\_\_\_\_\_
2. Number of rotating generators: \_\_\_\_\_  
\_\_\_\_\_
3. Number of turbines and type: (combustion, steam, hydro, engine generator, etc.): \_\_\_\_\_  
\_\_\_\_\_
4. Number and Nameplate Rating of static conversion devices (e.g. inverters for solar photovoltaic projects): \_\_\_\_\_  
\_\_\_\_\_
5. Total Nameplate Rating in kW, (@ 0.95 PF for synchronous generators): \_\_\_\_\_  
\_\_\_\_\_
6. Station service load for plant auxiliaries, kW and kvar: \_\_\_\_\_  
\_\_\_\_\_
7. Station service connection plan: \_\_\_\_\_  
\_\_\_\_\_
8. Manufacturer's design data sheet for each generator: \_\_\_\_\_  
\_\_\_\_\_

iv. **Tier 3 and Other Generator Data, Synchronous Machines**. Provide data for each different rotating-machine generator assembly, turbine, and shaft. Also, provide the graphs and parameters for each type and size of specified generator as supporting technical documentation:

1. Attach Reactive capability 'P-Q' curves: \_\_\_\_\_  
\_\_\_\_\_
2. Attach excitation 'Vee' curves: \_\_\_\_\_  
\_\_\_\_\_
3. Attach saturation and synchronous impedance curves: \_\_\_\_\_  
\_\_\_\_\_



4. Generator Identifier (unique name for unit # or plant): \_\_\_\_\_  
\_\_\_\_\_
5. Number of similar generators: \_\_\_\_\_
6. Complex power, kVA: \_\_\_\_\_
7. Active power, kW: \_\_\_\_\_
8. Terminal Voltage, kV: \_\_\_\_\_
9. Machine parameters:
  - a.  $S_b$  – Complex power base (kVA) upon which machine data is specified: \_\_\_\_\_
  - b.  $H$  – Normalized rotational kinetic energy of the generator/turbine/shaft assembly, kW-sec/kVA: \_\_\_\_\_  
\_\_\_\_\_
  - c.  $WR^2$  – Moment of inertia, lb. Ft<sup>2</sup>: \_\_\_\_\_
  - d.  $R_a$  – Armature resistance, pu: \_\_\_\_\_
  - e.  $X_d$  – Direct axis unsaturated synchronous reactance, pu: \_\_\_\_\_
  - f.  $X'_d$  – Direct axis unsaturated transient reactance, pu: \_\_\_\_\_
  - g.  $X'_q$  – Quadrature axis saturated and unsaturated transient reactance, pu: \_\_\_\_\_
  - h.  $X''_d$  – Direct axis saturated and unsaturated subtransient reactance, pu: \_\_\_\_\_
  - i.  $X_l$  – Stator leakage reactance, pu: \_\_\_\_\_
  - j.  $X_2$  – Negative-sequence reactance, pu: \_\_\_\_\_
  - k.  $X_0$  – Zero-sequence reactance, pu: \_\_\_\_\_
  - l.  $X_n$  – Zero-sequence unit grounding reactance, pu: \_\_\_\_\_
  - m.  $R_n$  – Zero-sequence unit grounding resistance, pu: \_\_\_\_\_
  - n.  $T'_{do}$  – Direct axis transient open circuit time constant, seconds: \_\_\_\_\_



- o.  $T'q_0$  – Quadrature axis transient open circuit time constant, seconds: \_\_\_\_\_  
 $T''d_0$  – Direct axis subtransient open circuit time constant, seconds: \_\_\_\_\_
  - p.  $T''q_0$  – Quadrature axis subtransient open circuit time constant, seconds: \_\_\_\_\_
  - q.  $S(1.0)$  – Saturation factor at rated terminal voltage, A/A: \_\_\_\_\_
  - r.  $S(1.2)$  – Saturation factor at 1.2 per unit of rated terminal voltage, A/A: \_\_\_\_\_
10. Excitation system modeling information:
- a. Type (static, ac rotating, etc.): \_\_\_\_\_
  - b. Maximum/Minimum dc current: \_\_\_\_\_
  - c. Maximum/Minimum dc voltage: \_\_\_\_\_
  - d. Attach nameplate information: \_\_\_\_\_
  - e. Attach Block diagram: \_\_\_\_\_
  - f. Attach Power System Stabilizer (PSS) type and characteristics: \_\_\_\_\_
11. Speed governor information with detailed modeling information for each type of turbine:
- a. Turbine type (Combustion, Steam, Wind, Hydro): \_\_\_\_\_  
\_\_\_\_\_
  - b. Total capability, kW (available peak operation rating): \_\_\_\_\_  
\_\_\_\_\_
  - c. Number of stages: \_\_\_\_\_  
\_\_\_\_\_
  - d. Manufacturer and model, if known: \_\_\_\_\_  
\_\_\_\_\_
  - e. Frequency vs. time operational limits, seconds at Hz: \_\_\_\_\_  
\_\_\_\_\_



f. Maximum turbine ramping rates, MW/minute, ramp up and ramp down: \_\_\_\_\_

v. **Tier 3 and Other Generator Data, Asynchronous Machines.**

1. Shunt reactive devices (capacitor banks) for power factor correction with induction generators or converters:
  - a. PF without compensation: \_\_\_\_\_
  - b. PF with full compensation: \_\_\_\_\_
  - c. Reactive power of total internal shunt compensation voltage, kvar: \_\_\_\_\_
2. AC/DC Converter devices employed with certain types of induction generator installations or with dc sources:
  - a. Number of converters: \_\_\_\_\_
  - b. Nominal ac voltage, kV: \_\_\_\_\_
  - c. Capability to supply or absorb reactive power, kvar: \_\_\_\_\_
  - d. Converter manufacturer, model name, number, version, kvar: \_\_\_\_\_
  - e. Rated/Limitation on Fault current contribution, kA: \_\_\_\_\_
  - f. Manufacturer's design data sheet for each AC/DC converter device: \_\_\_\_\_
3. Machine parameters:
  - a.  $S_b$  – Complex power base (kVA) upon which machine data is specified: \_\_\_\_\_
  - b. H – Normalized rotational kinetic energy of the generator/turbine/shaft assembly, seconds: \_\_\_\_\_  
\_\_\_\_\_
  - c.  $R_a$  – Armature resistance, pu: \_\_\_\_\_
  - d.  $X_d$  – Direct axis unsaturated synchronous reactance, pu: \_\_\_\_\_
  - e.  $X'_d$  – Direct axis unsaturated transient reactance, pu: \_\_\_\_\_



- f.  $X''_d$  – Direct axis saturated and unsaturated subtransient reactance, pu: \_\_\_\_\_
  - g.  $X_l$  – Stator leakage reactance, pu: \_\_\_\_\_
  - h.  $X_2$  – Negative-sequence reactance, pu: \_\_\_\_\_
  - i.  $X_0$  – Zero-sequence reactance, pu: \_\_\_\_\_
  - j.  $X_n$  – Zero-sequence unit grounding reactance, pu: \_\_\_\_\_
  - k.  $R_n$  – Zero-sequence unit grounding resistance, pu: \_\_\_\_\_
  - l.  $T'_{do}$  – Direct axis transient open circuit time constant, seconds: \_\_\_\_\_  
 $T''_{do}$  – Direct axis subtransient open circuit time constant, seconds: \_\_\_\_\_
  - m.  $S(1.0)$  – Saturation factor at rated terminal voltage, A/A: \_\_\_\_\_
  - n.  $S(1.2)$  – Saturation factor at 1.2 per unit of rated terminal voltage, A/A: \_\_\_\_\_
  - o.  $V_t$  – Voltage threshold for tripping, pu: \_\_\_\_\_
  - p.  $V_r$  – Voltage at which reconnection is permitted, pu: \_\_\_\_\_
  - q.  $T_v$  – Pickup time for voltage-based tripping, seconds: \_\_\_\_\_
  - r.  $T_{vr}$  – Time delay for reconnection, seconds: \_\_\_\_\_
  - s.  $F_t$  – Frequency threshold for tripping, Hz: \_\_\_\_\_
  - t.  $T_f$  – Pickup time for frequency-based tripping, seconds: \_\_\_\_\_
  - u. Reactive power required at no load, kvar: \_\_\_\_\_
  - v. Reactive power required at full load, kvar: \_\_\_\_\_
4. External Shunt Compensation:
- a. Bus Voltage: \_\_\_\_\_
  - b. Number and rating of each shunt capacitor section, SVC, DVAR, etc.: \_\_\_\_\_
  - c. Voltage/PF controller system description: \_\_\_\_\_
  - d. Methodology for Primary and Secondary voltage control: \_\_\_\_\_

---

vi. **DC Sources.**

- a. If the Generator Facility Interconnection includes dc sources such as fuel cells or photovoltaic devices, provide the number of dc sources and maximum dc power production per source in kW in addition to any of the above required information that is applicable: \_\_\_\_\_
- 

b. **Wind Generator Data Requirements.** If the Generator Facility Interconnection includes wind generators, provide the information requested below in addition to any of the above required information that is applicable:

- i. The collector system single line diagram that includes any proposed reactive equipment and all output from wind generator turbines;
- ii. Transformer information as required above for any transformers providing for the collector requirements of the wind Generating Facility; and
- iii. A Single-Machine Equivalent Representation of the generating facility. Please refer to the *WECC Wind Power Plant Power Flow Modeling Guide*, dated May 2008.

## **APPENDIX E – Tier 3 and Other Generator Technical Requirements**

When integrating Generating Facilities, Clark shall coordinate and cooperate on its assessments with Affected Interconnecting Entities. Assessments and agreements will address some or all of the following depending on the size and complexity of the generator:

1. Interconnection Requirements. Clark's Tier 3 or Other Generator Interconnection requirements will address, but are not limited to, the items listed below. The listed items will be addressed as part of Clark's system impact studies, interconnection studies, and/or agreements, as necessary, to achieve the required system performance.
  - a. Coordination of joint studies of new facilities or qualified change, as defined by Planning Coordinator, to existing facilities and their impacts on the interconnected transmission systems. Studies may be performed by Clark and/or Affected Interconnecting Entities to determine the magnitude of any adverse impacts caused by a requested Generator Facility Interconnection and to implement measures for mitigating such impacts. These studies may include but are not limited to the studies listed below and will be conducted if Clark's Engineering Organization or an Affected Interconnecting Entity determines that due to the complexity of the requested interconnection, the studies are needed:
    - i. Powerflow Study.
    - ii. Dynamic Stability Study.
    - iii. Short Circuit Study.
    - iv. Sub-Synchronous Resonance (SSR) Study.
    - v. Electromagnetic Transients Program (EMTP) Study.
  - b. Notification of proposed, new, or modified facilities to Affected Interconnecting Entities as soon as feasible.
    - i. Clark will provide such notification and assist in the arrangement of any required meetings and joint studies.
  - c. Voltage level and MW and MVAR capacity or demand at Point of Delivery.
  - d. Breaker duty and surge protection at the Point of Delivery and at adjacent electrical delivery facilities.
  - e. System protection and coordination.
  - f. Metering and telecommunications.
  - g. Grounding and safety issues.
  - h. Insulation and insulation coordination.



- i. Voltage, Reactive Power, and power factor control.
  - j. Power quality impacts.
  - k. Equipment Ratings.
  - l. Synchronizing of facilities.
  - m. Maintenance and coordination of maintenance.
  - n. Operational issues (abnormal frequency and voltages).
  - o. Inspection requirements for existing or new facilities.
  - p. Communications and procedures during normal and emergency operating conditions.
2. Transmission and Substation Facilities. Interconnections to Clark's Transmission System may require that one or more of Clark's transmission lines be looped through the facilities proposed to be installed in accordance with the Applicant's interconnection request or to be sectionalized with the addition of switching equipment. The design and ratings of these facilities shall not restrict the capability of the lines and Clark's transmission path rights.
- a. Transmission Line Designs. Transmission line designs, for transmission lines interconnecting into Clark's Electric System, shall meet the requirements of Clark's transmission line design standards including, but not limited to, satisfaction of the requirements of OSHA.
  - b. Substation Designs. Substation facilities that interconnect with Clark's Electric System must meet Clark's substation design and construction standards and must be designed to the applicable requirements of ANSI and IEEE Standards. Electrical equipment in the substation must be sized to carry the full current rating of the interconnected transmission path, and all interrupting devices, such as circuit breakers shall have interrupting capability sufficient to satisfactorily interrupt the maximum short circuit currents that may occur at the location of the Interconnection including margin for circuit breaker duty and DC offset.
  - c. System Protection and Control Schemes. System protection and control schemes are coordinated to provide for safety and equipment protection and to minimize disruption of services during disturbances. Interconnections generally require the addition or modification of such protection and control schemes. The new protection must be compatible with the existing protective relay schemes and shall not degrade the dependability or security of existing protective relay schemes. The protection scheme will also ensure there are no synchronization problems when closing breakers. Interconnected generation facilities will be subject

to NERC and WECC frequency and voltage ride-through requirements to the extent these requirements are applicable. Generators will be required to comply with the applicable requirements of the WECC Generating Unit Model Validation Policy, NERC and WECC generator modeling verification standards, and any WECC or NERC requirements to operate generators with automatic voltage controls and power system stabilizers.

3. Insulation Coordination. Power system equipment is designed to withstand voltage stresses associated with expected operating conditions. Adding or connecting new facilities may change equipment duty, and may require that existing equipment be replaced or modified or that switchgear, telecommunications, shielding, grounding, or surge protection be added to control voltage stress to acceptable levels. Voltage stresses, such as lightning or switching surges, and temporary over-voltages may affect equipment duty. Remedies will depend upon the equipment capability and the type and magnitude of the stress. Applicants shall make available to Clark all drawings, specifications, test plans, Application documents, equipment settings as well as any filings of such information to other parties related to a requested interconnection.
4. Station Grounding. Each interconnecting station must have a ground grid that is solidly connected to all metallic structures and any energized or non-energized metallic equipment. The grid shall limit the ground potential gradients to such voltage and current levels that will not endanger the safety of people or damage equipment which are in, or immediately adjacent to, the substation under normal and short circuit conditions. Ground grid size and type are dependent upon local soil conditions and available electrical fault current magnitudes, among other factors. In areas where ground grid voltage rises would not be within acceptable and safe limits, grounding rods and grounding wells may be required to reduce the ground grid resistance to acceptable levels. All grounding will follow the guidelines established in IEEE 80-2001 or the more recent guidelines found in the IEEE Guide in AC Substation Grounding. Design review and testing may be required to ensure these guidelines are met.
5. Transformers, Shunt Capacitors, Shunt Reactors, and Other Voltage Control Devices. Transformer tap settings, voltage ratings and set points, sizes of shunt-connected capacitor and/or reactor equipment as well as other voltage control devices shall be coordinated with Clark to optimize reactive flows and voltage profiles. Automatic controls may be necessary to maintain these profiles on the interconnected system.
6. Key Reliability and Availability Considerations. The Interconnection shall meet all applicable requirements of the WECC and NERC operating and planning standards and CIP standards. In addition, the following requirements apply to all Interconnections:

- a. Tools and spare equipment must be readily available at the Applicant's disposal to accomplish foreseeable operations and maintenance tasks.
  - b. Standardized design, planning and operating practices and procedures should be used so that the Interconnection may be readily incorporated into the existing transmission network.
  - c. For reliable operation, certain telecommunications, control, and protection equipment may need to be provided with redundancy.
  - d. The equipment for the Interconnection shall have sufficient capabilities for both the initial operation and for the long range operation.
  - e. Operations and maintenance personnel must be properly trained for both normal and emergency conditions.
  - f. Because of increased risks and potential hazards inherent with operating Applicant's facilities interconnected with Clark's Electric System, overall safety for life, quality of service and property is paramount. Clark will disconnect Applicant's facilities anytime Applicant's facilities pose a dangerous condition, and such disconnection is appropriate to protect safety of Clark's employees, customers, general public, or to maintain integrity of Clark's Electric System. Applicant agrees to comply with Clark's Safety Procedures in operation of its facilities.
7. Power Factor Considerations. Clark and Applicant will jointly plan and operate their systems, including reactive devices, so as not to place an undue burden on either party to supply or absorb reactive power.
- a. Generators interconnecting to Clark's Distribution System must operate within the voltage and power factor ranges specified by Clark. Variance may be allowed based on specific requirements, and charges may be incurred for losses or correction.
  - b. Generators interconnecting to Clark's Transmission System shall be capable of continuous operations at a power factor between 0.95 lagging and 0.95 leading. Unless otherwise mutually agreed to, the normal operational power factor will be 1.00 measured at the Point of Delivery of the Generating Facility to Clark's Transmission System. Based on system requirements for voltage support and Generating Facility design, Clark may require an alternate operational power factor and/or location where power factor will be measured. Additionally, such Clark requirements may include changes to tap settings on generator step-up transformers.

## 8. Metering and Telecommunications.

- a. Meters. All Generating Facility Interconnections to Clark's Transmission System will require metering at the transmission voltage level. Clark may, at its sole discretion allow low voltage metering with appropriate correction factors for electrical losses but shall have no obligation to do so. Metering equipment shall be installed whenever possible at the Point of Delivery between Clark and the Applicant's Generating Facilities. If the metering point and the Point of Delivery are not at the same location (only if allowed by Clark), Clark reserves the right to require transformer losses and/or line losses to be considered. Metering equipment shall include solid-state meters capable of measuring MW demand, MVar demand, MWh, MVarh, and both lagging or leading power factor. If power flow is capable of being bi-directional the metering system shall be designed to capture metered information for both the delivered direction and received direction in separate registers. These registers may be included in a single meter approved by Clark. All metering packages used on Clark's Electric System will be required to use (at a minimum) revenue-accuracy metering equipment, including the meter, instrument transformers, and associated devices. As may be required by Affected Interconnecting Entities, interchange quality metering may be required in certain circumstances in addition to or in lieu of revenue-accuracy metering. Relay-accuracy metering equipment required for system protection purposes is not acceptable for Clark billing metering. Upon request, Clark will make metering data available to the Applicant or to any agent of the Applicant at the sole expense of the Applicant.
  - i. Balancing Area Boundary Requirements. Clark's coordination with Affected Interconnecting Entities will include confirmation with either Bonneville or PacifiCorp as Balancing Authorities. Clark is required to determine and confirm which Balancing Authority metered boundaries the interconnection will be located.
- b. Telecommunications.
  - i. SCADA. Supervisory Control and Data Acquisition (SCADA) will be required for any interconnection Clark's Transmission System. Interconnections to Clark's Distribution System may require SCADA based upon Clark's sole discretion. If SCADA is required, any Remote Terminal Units (RTU) will be required to supply the following SCADA information:
    1. Status and control of isolating devices
    2. Interconnection Voltage, MW and MVars at the Point of Delivery (both directions if applicable).

3. Clark Transmission line(s) Voltage, MW and MVars (both directions if applicable).
    - ii. Voice Communications. Voice communication and communication requirements for protection purposes will be determined on a case-by-case basis. If required, a compatible and reliable communication media shall be provided for voice, SCADA and remote access to metering data. New communications facilities should be designed to conform to Clark's system requirements. Communications facilities installed for the express purpose of supporting power operations are to conform to the applicable sections of the following:
      1. WECC Guidelines for the Design of Critical Communications Circuits; and
      2. WECC Communications Systems Performance Guide for Electric Protection Systems.
      3. NERC COM standards.
    - iii. Telecommunications Standards. Communications facilities will be planned, engineered, constructed and tested per internal Clark procedures.
9. Equipment Ratings.
- a. Transmission Line Ratings. Transmission lines interconnecting into Clark's Electric System shall meet the requirements of Clark's Facilities Rating Methodology, including MVA, operating voltage, ampacity, insulation critical flashover, insulation clearances, shielding, tower grounding, and short circuit withstand requirements. In all cases, NESC and OSHA requirements shall be satisfied. Applicants shall make available to Clark all drawings and specifications, termination plans, and line ratings.
  - b. Substation Facility Ratings. Substation facilities interconnecting into Clark's Electric System shall meet the requirements of Clark's Facilities Rating Methodology and its substation design and construction standards and must be designed to the applicable requirements of NESC, NEC, ANSI, and IEEE Standards. Electrical equipment in the substation must be sized to carry the full continuous and short time current ratings of the interconnected transmission path. All interrupting devices, such as circuit breakers shall have interrupting capability sufficient to satisfactorily interrupt the maximum short circuit currents that may occur at the location of the Interconnection including margin for circuit breaker duty and DC offset. Where the substation becomes a facility within the interconnected transmission path, Clark will become the engineer of the facility, will procure all required equipment, and will construct the facility at the expense of the Applicant unless otherwise agreed to by Clark.

10. Inspection, Testing, Calibration and Maintenance. All transmission elements (i.e. lines, line rights-of-way, circuit breakers, control and protection equipment, metering, and telecommunications) shall be inspected and maintained in conformance with regional standards. Clark may request an annual certification that the Applicant has documented and implemented an adequate transmission maintenance and inspection plan for its interconnecting facilities.
- a. Pre-Energization Testing and Inspection. Pre-energization testing and inspection is the responsibility of the Applicant in accordance with a documented Inspection and Test Plan. Applicant shall make available to Clark all drawings, specifications, equipment settings, and test records of the interconnecting facilities.
  - b. Ongoing Maintenance and Inspection. Ongoing maintenance and inspection of Applicant's facilities shall be conducted by the Applicant, and the Applicant shall include in its inspection plans the specific scheduled maintenance and inspection intervals and/or conditions that trigger maintenance and inspection. Such plans shall also describe the maintenance methods and the criteria to be used to assess the condition of facility components. Interconnection related equipment owned by Clark or located within Clark's facilities will be inspected and maintained by Clark at the expense of the Applicant.
  - c. Maintenance Coordination. Each party will provide the other with reasonable notification for routine maintenance, operational tests, inspection activities, and meter testing that have an impact on the Generating Facility Interconnection. Any Generating Facility outages will be scheduled with Clark in accordance with Clark's Outage Reporting Procedures.
11. Power Quality. Interconnections will be required to meet Clark and industry standards regarding voltage flicker, harmonic distortion and interference.
12. Communications. Complete, precise, and timely communication is required for maintaining the reliability and security of a power system. Under normal operating conditions, the major link of communication with various interconnecting parties shall be by telephone lines. Clark and its customers will maintain communication which will include, but not be limited to, system paralleling or separation, scheduled or unscheduled shutdowns, equipment clearances, periodic load reports, maintenance schedules, tagging of interconnection interrupting devices, meter tests, relay tests, billing, and other routine communication. In case of emergency or abnormal operating conditions, various communication channels may be used. Emergency telephone numbers should be agreed upon by both parties prior to the actual interconnection date.



13. NERC FAC-002 Reliability Standard Considerations. All requirements for application, study, and approval of Tier 3 and Other Generators will apply to the connection of generators to Clark's BES facilities as follows:
- a. Types of connections include:
    - i. Interconnections of new Generating Facilities to Clark's BES facilities;
    - ii. Qualified change, as defined by Planning Coordinator, to existing Interconnections of Generating Facilities to Clark's BES facilities.
  - b. Studies of generator connections to Clark's BES facilities shall include the study requirements as described in these Tier 3 and Other Generator Technical Requirements and the following:
    - i. The reliability impact of the Interconnection, or qualified change, as defined by Planning Coordinator, to existing Interconnection, on the electric systems of Affected Interconnecting Entities;
    - ii. Adherence to applicable NERC and WECC Reliability Standards; regional and Transmission Owner planning criteria; and Generating Facility Interconnection requirements;
    - iii. Steady-state, short-circuit, and dynamics studies, as necessary, to evaluate system performance under both normal and contingency conditions; and
    - iv. Study assumptions, system performance, alternatives considered, and coordinated recommendations. While these studies may be performed independently, the results shall be evaluated and coordinated by Affected Interconnecting Entities.
  - c. Clark will conduct, coordinate, and cooperate with Affected Interconnecting Entities in the performance of its studies of generator connections to the BES facilities. The cost of such studies shall be the responsibility of the Applicant regardless of whether these studies are performed by Clark or Affected Interconnecting Entities.