

Interconnection with Electric Generators

For All Facilities up to 20 MW

1. Purpose and scope

- 1.1. The purpose of this chapter is to establish rules for determining the terms and conditions governing the interconnection of electric generating facilities with a maximum generating capacity of no greater than 20 Megawatts to the electric system of an utility over which the commission has jurisdiction.
- 1.2. These rules are intended to be consistent with the requirements of chapter 80.60 RCW, Net Metering of electricity and to comply with provisions of the Energy Policy Act of 2005, Pub. L. No. 109-58 (2005) that amended section 111 (d) of the Public Utility Regulatory Policy Act (PURPA) relating to Net Metering (subsection 11) and Interconnection (subsection 15).
- 1.3. These standards govern the terms and conditions under which the applicant's generating facility will interconnect with, and operate in parallel with, the Utility's electric system. These standards do not govern the settlement, purchase or delivery of any power generated by the applicant's generating facility.

2. Application of Rules

- 2.1. These rules include various requirements applicable to the Utility, the applicant and the generator.
- 2.2. These rules modify, if necessary, any existing interconnection rules of the Utility, including but not limited to, rules implementing chapter 80.60 RCW, Net Metering of Electricity.

3. Definitions

- 3.1. "**Applicant**" means any person, corporation, partnership, government agency, or other entity applying to interconnect a generating facility to the Utility's electric system pursuant to this chapter.
- 3.2. "**Application**" means the written notice provided by the applicant to the Utility that initiates the interconnection process.
- 3.3. "**Certificate of completion**" means the form completed by the applicant or generator and the electrical inspector having jurisdiction over the installation of the facilities indicating completion of installation and inspection of the interconnection.
- 3.4. "**Commission**" means the governing board of Public Utility District No. 1 of Clallam County.
- 3.5. "**Electric system**" means all electrical wires, equipment, and other facilities owned or provided by the Utility that are used to transmit electricity to customers.
- 3.6. "**Generating facility**" means a source of electricity owned by the applicant or generator that is located on the applicant's side of the point of common coupling, and all facilities ancillary and appurtenant thereto, including interconnection facilities, which the applicant requests to interconnect to the Utility's electric system.
- 3.7. "**Generator**" means the entity that owns and/or operates the generating facility interconnected to the Utility's electric system.
- 3.8. "**Initial operation**" means the first time the generating facility is in parallel operation with the electric system.
- 3.9. "**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.

- 3.10. "**Interconnection**" means the physical connection of a generating facility to the electric system so that parallel operation may occur.
- 3.11. "**Interconnection facilities**" means the electrical wires, switches and other equipment used to interconnect a generating facility to the electric system.
- 3.12. "**Maximum generating capacity**" means the maximum amount of energy that the generator is capable of producing on an instantaneous basis.
- 3.13. "**Model interconnection agreement**" means standardized terms and conditions that govern the interconnection of generating facilities pursuant to these standards. 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.
- 3.14. "**Net metering**" means measuring the difference between the electricity supplied by a utility and the electricity generated by a generating facility over the applicable billing period.
- 3.15. "**Network distribution system (grid or spot)**" 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 secondary circuits serving one (a spot network) or more (a grid network) utility customers.
- 3.16. "**Parallel operation**" or "**operate in parallel**" means the synchronous operation of a generating facility while interconnected with a utility's electric system.
- 3.17. "**Point of common coupling**" or "**PCC**" means the point where the generating facility's local electric power system connects to the utility'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 utility.
- 3.18. "**Utility**" means Public Utility District No. 1 of Clallam County which owns and operates the electrical distribution system, or the electrical distribution system itself, onto which the applicant seeks to interconnect a generating facility.

4. Technical Standards for Interconnection

- 4.1. The technical standards listed in this section shall apply to all generating facilities to be interconnected to the Utility within the size range indicated.
 - 4.1.1. General interconnection requirements.
 - 4.1.1.1. Any generating facility desiring to interconnect with the Utility's electric system or modify an existing interconnection must meet all minimum technical specifications applicable, in their most current approved version, as set forth in this chapter.
 - 4.1.1.2. A generator 300 kW or smaller must comply with all requirements from Table 1 that are applicable to the interconnection of that generating facility. For generators larger than 300 kW see subsection 4.1.1.4 below.
 - 4.1.1.3. Any single or aggregated generating facility with a capacity greater than 50 kW shall require a three-phase interconnection.
 - 4.1.1.4. For any proposed generator larger than 300 kW, the Utility will evaluate the application for interconnection and may require any of the following studies prior to approval of the application.
 - 4.1.1.4.1. Power Flow
 - 4.1.1.4.2. Metering
 - 4.1.1.4.3. Metering Relay/Protection
 - 4.1.1.4.4. Communications/Telemetry
 - 4.1.1.4.5. System Impact Study
 - 4.1.1.4.6. Facilities Study

4.1.1.5. Additional studies, beyond those on this list, may be necessary as determined by the Utility. An estimate of the costs for completing each or all of the studies will be provided by the Utility and a deposit against that cost will be required.

Table 1. 300 kW or Smaller.

	Single-Phase		Three-Phase	
	*Capacity			
<u>Feature</u>	≤ 50 kW Inverter based	≤ 50 kW Non- inverter based	≤ 300 kW Inverter based	≤ 300 kW Non- inverter based
IEEE 1547 compliant	√	√	√	√
UL 1741 listed	√		√	
Interrupting devices (capable of interrupting maximum available fault current)	√ [8]	√	√ [8]	√
Interconnection disconnect device (manual, lockable, visible, accessible)	[1]	√	√	√
System Protection		√ [3][4][6]		√ [3][4][5][6]
Over-voltage trip	√ [8]	√	√ [8]	√
Under-voltage trip	√ [8]	√	√ [8]	√
Over/Under frequency trip	√ [8]	√	√ [8]	√
Automatic synchronizing check		√		√
Ground over-voltage or over-current trip for Utility system faults.				√ [2]
Power factor		√ [7]		√ [7]

Notes:

√ – Required feature (blank = not required)

* Capacity of single or aggregate generation

[1] – Utility may choose to waive this requirement

[2] – May be required by Utility; selection based on grounding system

[3] – No single point of failure shall lead to loss of protection.

[4] – All protective devices shall fully meet the requirements of ANSI C37.90

[5] – Utility will specify the transformer connection.

[6] – It is the customers’ responsibility to ensure that their system is effectively grounded as defined by IEEE Std. 142 at the point of common coupling .

[7] – Variance may be allowed based upon specific requirements per Utility review. Charges may be incurred for losses.

[8] - UL 1741 listed equipment provides required protection.

- 4.1.1.6. The specifications and requirements in this section are intended to mitigate possible adverse impacts caused by the generating facility on Utility equipment and personnel and on other customers of the Utility. 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.
- 4.1.1.7. The specifications and requirements in this section shall apply generally to the generator-owned electric generation equipment (or any other facilities or equipment not owned by the Utility) to which this standard and agreement(s) apply throughout the period encompassing the generator's installation, testing and commissioning, operation, maintenance, decommissioning and removal of said equipment. The Utility may verify compliance at any time, with reasonable notice.
- 4.1.1.7.1. Code and standards. Applicant shall conform to all applicable codes and standards for safe and reliable operation. 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 generator shall be responsible to obtain all applicable permit(s) for the equipment installations on its property.
- 4.1.1.7.2. Safety. All safety and operating procedures for joint use equipment shall 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.
- 4.1.1.7.3. Power quality. Installations will be in compliance with all applicable standards including IEEE Standard 519-1992 Harmonic Limits.
- 4.1.1.8. The generator shall comply with the requirements in 4.1.1.7. and 4.1.1.7.1. – 4.1.1.7.3. of this subsection. However, at its sole discretion, the Utility may approve 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.
- 4.1.1.9. Momentary Paralleling of Standby Generators. Protective relays to isolate the customer owned generation for faults in the Utility's distribution system are not required if the paralleling operation is automatic and takes place for less than one hundred milli-seconds. Parallel operation of the customer owned generation with the Utility's distribution system shall be prevented when the Company's line is dead or out of phase with the customer owned generation. The control scheme for automatic paralleling must be submitted by the Interconnecting Customer for review and acceptance by the Utility prior to the customer owned generation being allowed to interconnect.

4.1.2. Specific interconnection requirements.

- 4.1.2.1. Applicant shall furnish and install on applicant's side of the meter, a UL-approved safety disconnect switch which shall be capable of fully disconnecting the applicant's generating facility from Utility's electric system.

The disconnect switch shall be located adjacent to utility meters and shall be of the visible break type in a metal enclosure which can be secured by a padlock. The disconnect switch shall be accessible to Utility personnel at all times.

- 4.1.2.2. The requirement in 4.1.2.1. of this subsection may be waived by the Utility if:
 - 4.1.2.2.1. Applicant provides interconnection equipment that applicant can demonstrate, to the satisfaction of Utility, performs physical disconnection of the generating equipment supply internally; and
 - 4.1.2.2.2. Applicant agrees that its service may be disconnected entirely if generating equipment must be physically disconnected for any reason
- 4.1.2.3. The Utility shall have the right to disconnect the generating facility at the disconnect switch under the following circumstances: When necessary to maintain safe electrical operating conditions; if the generating facility does not meet required standards; or if the generating facility at any time adversely affects or endangers any person, the property of any person, the Utility's operation of its electric system or the quality of Utility's service to other customers.
- 4.1.2.4. Nominal voltage and phase configuration of applicant's generating facility must be compatible to the utility system at the point of common coupling.
- 4.1.2.5. Applicant must provide evidence that its generation will never result in reverse current flow through the Utility's network protectors. All instances of interconnection to secondary spot distribution networks shall require review and written pre-approval by Utility. Interconnection to distribution secondary grid networks is not allowed. Closed transition transfer switches are not allowed in secondary network distribution systems.
- 4.1.3. Specifications applicable to all inverter-based interconnections.
 - 4.1.3.1. Any inverter-based generating facility desiring to interconnect with the Utility's electric system or modify an existing interconnection must meet the technical specifications, as set forth below. The version of the technical specifications approved by the Commission is specified in Chapter 10. A more recent approved version may supersede specifications on the list below.
 - 4.1.3.1.1. IEEE Standard 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems, for systems 10 MVa or less.
 - 4.1.3.1.2. UL Standard 1741, Inverters, Converters, and Controllers for Use in Independent Power Systems. Equipment must be UL listed.
 - 4.1.3.1.3. IEEE Standard 929, IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems.
- 4.1.4. Requirements applicable to all non-inverter-based inter-connections.
 - 4.1.4.1. Non-inverter-based interconnection requests may require more detailed Utility review, testing, and approval, at applicant cost, of the equipment proposed to be installed to ensure compliance with applicable technical specifications, in their most current approved version, including:
 - 4.1.4.1.1. IEEE Standard 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems, for systems 10 MVa or less.
 - 4.1.4.1.2. ANSI Standard C37.90, IEEE Standard for Relays and Relay Systems Associated with Electric Power Apparatus.
 - 4.1.4.1.3. Applicants proposing such interconnection may also be required to submit a power factor mitigation plan and/or other studies or plans as appropriate for Utility review and approval.

5. Application for Interconnection

- 5.1. When an applicant requests interconnection from the Utility, the applicant shall be responsible for conforming to the rules and regulations that are in effect and on file with the Utility. The Utility will designate a point of contact and publish a telephone number or web site address for this specific purpose. The applicant seeking to interconnect a generating facility under these rules must fill out and submit a signed application form to the Utility. Information must be accurate, complete, and approved by the Utility prior to installing the generating facility.
- 5.2. Application fees. A non-refundable interconnection application fee may be required by the sole determination of the Utility according to facility size.
- 5.3. Non-Discrimination. All generation interconnection applications pursuant to this chapter will be processed by the Utility in a non-discriminatory manner.
- 5.4. Application evaluation. All generation interconnection requests pursuant to this chapter will be reviewed by the Utility for compliance with chapter rules. If the Utility in its sole discretion finds that the application does not comply with this chapter, the Utility may reject the application. If the Utility rejects the application, it shall provide the applicant with written notification stating its reasons for rejecting the application.

6. Interim and Interconnection Agreements and Costs.

- 6.1. Once an application is accepted by the Utility as complete, the Utility shall determine if any additional engineering, safety, reliability or other studies are required.
- 6.2. If the Utility determines that additional studies are required, the Utility will provide to the applicant or generator a Study Agreement (SA). The SA shall include a description of the studies and a good faith estimate of the cost to perform the studies. For applications for generators of 300 kW or less, the applicant or generator shall have thirty (30) business days to return the completed SA along with any deposit required by the Utility against the estimated costs. For applications for facilities larger than 300 kW, the time frame to return the completed SA and required deposit(s) shall be determined in consultation with the Utility.
- 6.3. Upon completion of the studies, the Utility shall provide the applicant or generator with the results of the studies, including any additional interim agreements, such as construction agreements, that may be necessary and a cost estimate to complete the interconnection. If the studies determine that the interconnection is denied pursuant to RCW 80.60, the Utility shall provide notice of denial to the applicant and the reasons for the denial.
- 6.4. The Utility shall provide an Interconnection Agreement (IA) to the applicant to be completed and executed by the applicant:
 - 6.4.1. for facilities 300 kW or less, within thirty (30) days;
 - 6.4.2. for facilities greater than 300 kW, the time frame for execution of the IA shall be determined in consultation with the Utility.
- 6.5. Along with the completed interconnection agreement, the applicant shall also make a deposit required by the Utility against the estimated costs to complete the interconnection.
- 6.6. Failure to return completed agreements and required deposits within the time frames specified in subsections 6.2 and 6.4 of this section may result in termination of application process by the Utility. Terms and conditions for termination of the IA shall be contained within the IA.

7. General Terms and Conditions of Interconnection

7.1. The general terms and conditions listed in this section shall apply to all generating facilities interconnecting to the Utility under this chapter.

7.1.1. Any electrical generating facility must comply with these rules to be eligible to interconnect and operate in parallel with the Utility's electric system. These standards shall apply to all interconnecting generating facilities that are intended to operate in parallel with the Utility'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 the Utility or any third party purchaser.

7.1.2. In order to ensure system safety and reliability of interconnected operations, all interconnected generating facilities shall be constructed and operated by generator in accordance with these standards and all other applicable federal, state, and local laws and regulations.

7.1.3. Prior to initial operation, all generators must submit a completed certificate of completion to the Utility, execute an appropriate Interconnection Agreement and any other agreement(s) required for the disposition of the generating facility's electric power output. The Interconnection Agreement between the Utility and generator outlines the interconnection standards, cost allocation and billing agreements, and on-going maintenance and operation requirements.

7.1.4. Applicant or generator shall promptly furnish the Utility 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 the Utility from time to time.

7.1.5. For the purposes of public and working personnel safety, any non-approved generation interconnections discovered will be immediately disconnected from the utility system.

7.1.6. To ensure reliable service to all Utility customers and to minimize possible problems for other customers, the Utility will review the need for a dedicated-to-single-customer distribution transformer. If the Utility requires a dedicated distribution transformer, the applicant or generator shall pay for all costs of the new transformer and related facilities.

7.2. Metering.

7.2.1. Net metering for fuel cells, facilities that produce electricity and used and useful thermal energy from a common fuel source, or facilities that use water, wind, solar energy, or biogas from animal waste as a fuel as set forth in chapter 80.60 RCW: The Utility shall install, own and maintain a kilowatt-hour meter, or meters as the installation may determine, capable of registering the bi-directional flow of electricity at the point of common coupling at a level of accuracy that meets all applicable standards, regulations and statutes. The meter(s) may measure such parameters as time of delivery, power factor, voltage and such other parameters as the Utility shall specify. The applicant shall provide space for metering equipment. It will be the applicant's responsibility to provide the current transformer enclosure (if required), meter socket(s) and junction box after the applicant has submitted drawings and equipment specifications for Utility approval. The Utility may approve other generating sources for net metering but is not required to do so.

- 7.2.2. Production metering: The Utility may require separate metering for production. This meter will record all generation produced and may be billed separately from any net metering or customer usage metering. All costs associated with the installation of production metering will be paid by the applicant.
- 7.3. Common labeling furnished or approved by the Utility and in accordance with NEC requirements must be posted on meter base, disconnects, and transformers informing working personnel that generation is operating at or is located on the premises.
- 7.4. No additional insurance will be necessary for a net metered facility that is a qualifying generating facility under chapter 80.60 RCW. A qualifying facility under RCW 80.60 is one that is 100 kW or less; and that uses water, wind, solar energy, or biogas from animal waste as a fuel, fuel cells, or that produces electricity and used and useful thermal energy from a common fuel source. For other generating facilities permitted under these standards but not a qualifying facility under chapter 80.60 RCW, additional insurance, limitations of liability and indemnification may be required by the Utility.
- 7.5. Prior to any future modification or expansion of the generating facility, the generator will obtain Utility review and approval. The Utility reserves the right to require the generator, at the generator's expense, to provide corrections or additions to existing electrical devices in the event of modification of government or industry regulations and standards.
- 7.6. For the overall safety and protection of the utility system, chapter 80.60 RCW currently limits interconnection of generation for net metering to 0.25% of the Utility's peak demand during 1996. Additionally, interconnection of generating facilities to individual distribution feeders will be limited to 10% of the feeder's peak capacity. However, the Utility may, in its sole discretion, allow additional generation interconnection beyond these stated limits, or, if indicated by engineering, safety or reliability studies, restrict or prohibit new or expanded interconnected generation capacity on any feeder, circuit or network.
- 7.7. It is the responsibility of the generator to protect its facilities, loads and equipment and comply with the requirements of all appropriate standards, codes, statutes and authorities.
- 7.8. Charges by the Utility to the applicant or generator 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 Utility testing, qualification, and approval of non-UL 1741 listed equipment. The generator shall be responsible for any costs associated with any future upgrade or modification to its interconnected system required by modifications in the Utility's electric system.
- 7.9. This section does not govern the settlement, purchase or delivery of any power generated by applicant's generating facility. The purchase or delivery of power, including net metering of electricity pursuant to chapter 80.60 RCW, 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 the commission. Any such agreement shall be complete prior to initial operation and filed with the commission.
- 7.10. Generator may disconnect the generating facility at any time; provided that the generator provides reasonable advance notice to the Utility.

- 7.11. Generator shall notify the Utility 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 generator shall not assign its rights or obligations under any agreement entered into pursuant to these rules without the prior written consent of Utility, which consent shall not be unreasonably withheld.

8. Certificate of Completion.

- 8.1. All generating facilities must obtain an electrical permit and pass electrical inspection before they can be connected or operated in parallel with the Utility's electric system. Generator shall provide to Utility written certification that the generating facility has been installed and inspected in compliance with the local building and/or electrical codes.

9. Filings

- 9.1. The Utility shall maintain on file for inspection at its place of business, the charges, terms and conditions for interconnections pursuant to this chapter. Such filing shall include model forms of the following documents and contracts:
 - 9.1.1. Application.
 - 9.1.2. Model interconnection agreement.
 - 9.1.3. Certificate of completion.

10. Adoption by Reference

- 10.1. In this chapter, the Utility adopts by reference all or portions of regulations and standards identified below. They are available for inspection at the Utility's office or as otherwise indicated. The publications, effective date, references within this chapter, and availability of the resources are as follows:
 - 10.1.1. The National Electrical Code is published by the National Fire Protection Association (NFPA).
 - 10.1.1.1. The Utility adopts the version published in 2005.
 - 10.1.1.2. The National Electrical Code is a copyrighted document. Copies are available from the NFPA at 1 Batterymarch Park, Quincy, MA, 02169 or at internet address <http://www.nfpa.org>.
 - 10.2.1 National Electric Safety Code (NESC).
 - 10.2.1.1 The Utility adopts the version published in 2002.
 - 10.2.1.2 Copies of the National Electric Safety Code are available from the Institute of Electrical and Electronics Engineers at <http://standards.ieee.org/nesc>
 - 10.3.1 Institute of Electrical and Electronics Engineers (IEEE) Standard 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems.
 - 10.3.1.1. The Utility adopts the most recent version adopted by IEEE.
 - 10.3.1.2. Copies of IEEE Standard 1547 are available from the Institute of Electrical and Electronics Engineers at www.ieee.org/web/standards/home.
 - 10.4.1. Institute of Electrical and Electronics Engineers (IEEE) Standard 929, Recommended Practice for Utility Interface of Photovoltaic (PV) Systems.
 - 10.4.1.1. The Utility adopts the version published in 2000.
 - 10.4.1.2. Copies of IEEE Standard 929 are available from the Institute of Electrical and Electronics Engineers at:
www.ieee.org/web/standards/home.

- 10.5.1. American National Standards Institute (ANSI) Standard C37.90, IEEE Standard for Relays and Relay Systems Associated with Electric Power Apparatus.
 - 10.5.1.1. The Utility adopts the version published in 2005.
 - 10.5.1.2. Copies of IEEE Standard C37.90 are available from the Institute of Electrical and Electronics Engineers at:
www.ieee.org/web/standards/home
- 10.6.1 Institute of Electrical and Electronics Engineers (IEEE) Standard 519, Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems.
 - 10.6.1.1 The Utility adopts the version published in 1992.
 - 10.6.1.2 Copies of IEEE Standard 519 are available from the Institute of Electrical and Electronics Engineers at
www.ieee.org/web/standards/home
- 10.7.1. Underwriters Laboratories (UL), including UL Standard 1741, Inverters, Converters, and Controllers for Use in Independent Power Systems.
 - 10.7.1.1. The Utility adopts the version published in 2005.
 - 10.7.1.2. UL Standard 1741 is available from Underwriters Laboratory at <http://www.ul.com>.
- 10.8.1 Occupational Safety and Health Administration (OSHA) Standard at 29 CFR 1910.269.
 - 10.8.1.1 The Utility adopts the version published in 1994.
 - 10.8.1.2 Copies of Title 29 Code of Federal Regulations are available from the U.S. Government Online Bookstore, <http://bookstore.gpo.gov/>, and from various third-party vendors.
- 10.9.1. Washington Division of Occupational Safety and Health (DOSH) Standard, chapter 296-155 WAC.
 - 10.9.1.1. The Utility adopts the version in effect on March 1, 2006.
 - 10.9.1.2. The DOSH Standard is available from the Washington Department of Labor and Industries at P.O. Box 44000, Olympia, WA 98504-4000, or at internet address <http://www.lni.wa.gov>.