

Chapter 480-100 WAC - ELECTRIC COMPANIES

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PART 4--METERING RULES

WAC 480-100-308 Meter location. (1) Subject to the utilities' requirements, customers must provide a place to install the metering equipment that is:

- (a) Readily accessible to utility employees without risks of bodily harm; and
- (b) Free from vibration, corrosive atmosphere, and abnormal temperatures.

(2) Upon request by a customer or a customer's representative, electric utilities must provide a written description of acceptable meter installation parameters applicable to the customer's electrical service needs.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-308, filed 5/3/01, effective 6/3/01.]

WAC 480-100-313 Meter charges. (1) An electric utility will make no charge for furnishing and installing the meter or meters required to determine the customer's usage for billing of electric service in accordance with the utility's filed tariff. The utility may charge for additional meters requested by the customer or required by the utility's tariff for service beyond determining the customer's bill.

- (2) No meter may be required on unmetered load.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-313, filed 5/3/01, effective 6/3/01.]

WAC 480-100-318 Meter readings, multipliers, and test constants. (1) Electric utilities must use electric meters or other such devices to accurately record or indicate the quantity of electricity sold to customers. Such measuring devices will allow utilities to calculate a customer's consumption in units of kilowatt hours or other units as filed in the company's tariffs.

(2) Electric utilities that decide to either measure a customer's consumption with a device that employs a multiplier or calculate consumption from recording devices must provide customers, upon request, information sufficient to enable the customer to compute the quantity consumed.

(3) Indirect reading meters and those that operate from instrument transformers must have the multiplier plainly marked on the dial of the instrument or be otherwise suitably marked.

(4) The watt-hour constant for the meter itself must be placed on all watt-hour meters (as specified in ANSI C12.1). Information about the ANSI C12.1 regarding the version adopted and where to obtain it is set out in WAC 480-100-999, Adoption by reference.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-318, filed 5/3/01, effective 6/3/01.]

WAC 480-100-328 Meter identification. Electric utilities must identify each meter by a unique series of serial numbers, letters, or combination of both, placed in a conspicuous position on the meter.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-328, filed 5/3/01, effective 6/3/01.]

WAC 480-100-333 Initial accuracy of electric meters. All meters must be in good order and adjusted to register as nearly correct as practicable prior to being put into service or returned to service following testing or other work. All meters in service must be sealed by the use of a sealing device acceptable to the commission.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-333, filed 5/3/01, effective 6/3/01.]

WAC 480-100-338 Accuracy requirements for electric meters. (1) Watt-hour meter accuracy.

(a) The requirements for watt-hour meters used for measuring electrical quantities supplied include, but are not limited to:

(i) All meters must be of proper design for the circuit on which they are used, be in good mechanical and/or electronic condition, have adequate insulation, correct internal connections, and correct register;

(ii) Mechanical meters must not creep at "no load" more than one full revolution of the disk in five minutes:

(A) When the load wires are disconnected and potential is impressed; or

(B) In a shop test where the load wires are disconnected and the permissible voltage variation is impressed;

(b) All meters must be capable of registering no more than plus or minus 2.0 percent error when subject to a current ranging between five and ten percent of the meter's nameplate test current (ta) value, at the meter's rated voltage, and at unity power factor;

(c) All meters must be capable of registering no more than plus or minus 2.0 percent error when subject to a current ranging between seventy-five and one hundred fifty percent of the meter's nameplate test current (ta) value, at the meter's rated voltage, and at unity power factor;

(d) All meters must be capable of registering no more than plus or minus 3.0 percent error when subject to approximately one hundred percent of the meter's nameplate test current (ta) value, at the meter's nameplate rated voltage, and at a fifty percent lagging power factor;

(e) All polyphase meters must have the elements in balance within 2.0 percent when subject to a current approximately one hundred percent of the nameplate test current value, at the meter's rated voltage, at both unity and fifty percent lagging power factor.

(2) **Demand meter accuracy.**

(a) The requirements for demand meters, demand registers, or demand attachments used to measure a customer's service include, but are not limited to:

- (i) The device must be in good mechanical and electrical condition;
- (ii) The device must have the proper multiplier, indicating scale, resetting apparatus, and contact device if used;
- (iii) The device must not register at no load;

(b) The device must achieve the following accuracies:

- (i) Curve-drawing meters that record quantity-time curves, and integrated-demand meters must be accurate to within plus or minus 2.0 percent of full scale throughout their working range;
- (ii) Timing elements measuring specific demand intervals must be accurate to within plus or minus 2.0 percent and the timing element that provides the time of day record of when the demand occurs must be accurate to within plus or minus four minutes in twenty-four hours;
- (iii) Lagged-demand meters must be accurate to within plus or minus 4.0 percent of final indication;

(c) Mechanical and lagged demand meters must be tested at load points above fifty percent of full scale as specified in ANSI C12.1. Information about the ANSI C12.1 regarding the version adopted and where to obtain it is set out in [WAC 480-100-999](#), Adoption by reference.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-338, filed 5/3/01, effective 6/3/01.]

WAC 480-100-343 Statement of meter test procedures. (1) Electric utilities must include in their tariffs a statement describing their practices under these rules covering:

(a) A description of methods used and frequency of tests for determining electric meter accuracy. The description must include, but is not limited to:

- (i) Test group detail and selection procedures;
- (ii) Performance standard details for meters that exceed the maximum allowable tolerance for slow as well as fast meters;
- (iii) The corrective action and time period in which such action will be implemented; and
- (iv) Reference to an industry standard such as ANSI C12.1 or ANSI/[isrt]ASQC-Z1.9 that will establish acceptable criteria for numerical analysis. Information about the ANSI C12.1 regarding the version adopted and where to obtain it is set out in [WAC 480-100-999](#), Adoption by reference.

(b) A description of meter testing equipment, including methods employed to ascertain and maintain accuracy of all testing equipment.

(c) If an electric utility does not maintain meter testing equipment, the electric utility must state that it will use a qualified testing laboratory for this purpose. The utility must notify the commission by separate correspondence of the name of the testing laboratory making meter tests if it does not maintain meter testing equipment.

(d) The testing and adjustment program used for meters prior to installation and periodically after installation, if applicable.

(2) If an electric utility changes any portion of its meter test procedures after they have been approved by the commission, the utility must submit a revised tariff.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-343, filed 5/3/01, effective 6/3/01.]

NOTES:

Reviser's Note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 480-100-353 Meter history records. (1) Electric utilities must keep records showing the history of each meter purchased and installed. Such records must be maintained for the life of the meter plus three months.

The forms of such records are subject to commission approval and must contain the following information at a minimum:

- (a) The approximate date of purchase;
- (b) The manufacturer's name and meter number or the utility's own unique meter identification number;
- (c) The place(s) of installation; and
- (d) The readings at the time of each installation and each removal.

(2) The records must include the date of all tests made on the meter, together with data recorded and computations made to determine the meter's accuracy. If a test is a complaint test, the records must include the complainant's name and the meter's calculated accuracy before and after the test.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-353, filed 5/3/01, effective 6/3/01.]

PART 5--SAFETY AND STANDARDS RULES

WAC 480-100-358 Instrument transformers. (1) Instrument transformers used in conjunction with metering equipment to measure customers' service must:

(a) Be in proper mechanical condition and have electrical insulation satisfactory for the service in which they are used; and

(b) Have characteristics such that the combined inaccuracies of all transformers supplying one or more meters in a given installation will not exceed the following:

100% Power Factor	50% Power Factor
10% Current	100% Current 10% Current
	100% Current
1.5% error	0.75% error 3.0% error 2.0% error

(2) Meters used in conjunction with instrument transformers must be adjusted so that the overall accuracy of the meter installation (including both meter and instrument transformers) will meet the requirements specified in WAC 480-100-338, Accuracy requirements for electric meters. Instrument transformers may be tested with the meter with which they are associated, or separately. Except as provided in these rules, if transformers are tested separately, meters must also be tested to assure that the overall installation meets the prescribed accuracy requirements.

(3) Adjustment of the meter to correct instrument accuracy errors is not necessary when instrument transformers with the following accuracy characteristics are used:

(a) **Instrument current transformers.** The combined effect of ratio error and phase angle on the accuracy of the meter at any load power factor from sixty percent lagging to unity does not exceed six-tenths of one percent at ten percent rated current, or three-tenths of one percent at approximately one hundred percent rated current;

(b) **Instrument potential transformers.** The combined effect of ratio error and phase angle on the accuracy of the meter from ninety percent rated voltage to one hundred ten percent rated voltage, at any load power factor from sixty percent lagging to unity, does not exceed three-tenths of one percent.

(4) Electric utilities must keep instrument transformer test results on record and available for use when transformers are installed.

(5) Phase shifting transformers must have secondary voltages that are within plus or minus one percent of the voltage impressed on primary terminals, when tested under balanced line voltage conditions.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-358, filed 5/3/01, effective 6/3/01.]

WAC 480-100-363 Portable indicating instruments. (1) Electric utilities must maintain in reasonable working order all portable indicating electrical instruments used to determine quality of electrical service, such as volt meters, ammeters, and watt meters, and all fixed-location meter testing equipment in use and, if in question, must check it against suitable reference standards. If suitable reference standards are not available within the utility, the utility must check its portable instruments at a standardizing laboratory meeting specifications recommended by the meter manufacturer.

(2) Electric utilities must adjust portable analog indicating instruments that are found appreciably in error at zero. If a portable analog indicating instrument is in error by more than one percent at commonly used scale deflections, the electric utility must adjust it, unless the instrument is accompanied by a calibration card.

(3) Electrical utilities must maintain in good working order, as specified by the manufacturer of such instruments, all portable indicating electrical instruments used for purposes other than determining the quality of electrical service, such as instruments primarily for the safety of workers.

(4) Electric utilities must keep history and calibration records for each portable indicating electrical instrument used to determine quality of electrical service as defined in subsection (1) of this section, as long as the instrument is in service.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-363, filed 5/3/01, effective 6/3/01.]

WAC 480-100-368 Standard frequency. Any electric utility supplying alternating current must design and maintain its distribution system for a standard operating frequency of sixty cycles per second under normal operating conditions.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-368, filed 5/3/01, effective 6/3/01.]

WAC 480-100-373 Standard voltage and permissible variation. (1) Voltage means the voltage existing with loads operating under stable conditions. Each electric utility must adopt standard voltages for its different classes of standard voltage service and file these standards with the commission in the form of tariffs.

(2) Electric utilities must maintain the voltage on their distribution system reasonably constant and any allowed variation must be a gradual change in voltage as a result of normal changes in load.

The voltage on each primary distribution feeder must be maintained as follows:

- (a) Voltage variations may not be more than five percent above or below the standard voltage adopted; and
- (b) The total voltage variation from minimum to maximum value may not exceed eight percent of the standard voltage.

A utility may allow greater voltage variation than that specified in this rule in case of emergency service or when service is supplied directly from a transmission line. A utility may also permit greater voltage variations in an area where the revenues received do not justify close voltage regulation. In such cases, electric utilities must provide the best voltage regulation that is economically and technically practicable under the circumstances.

(3) Voltage variations in excess of those specified, caused by the action of the elements, by infrequent and unavoidable fluctuations of short duration due to system operation, or by the operation of power apparatus on the customer's premises which necessarily requires large starting currents and only affects the user of such apparatus, will not be considered a violation of this rule.

(4) Customers must control and operate the equipment on their premises in such a way that its starting and operating characteristics will not cause an instantaneous voltage drop of more than four percent of the standard voltage as measured at the point of interconnection with the electric utility. Likewise, customers must control and operate their equipment in such a way that it does not cause damage or interfere with the normal operation of the electric utility's facilities or of the facilities or equipment of another customer, such as causing excessive flicker in other customers' lights. Utilities are not required to monitor customers' equipment and its interactions with third party or utility equipment on an ongoing basis.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-373, filed 5/3/01, effective 6/3/01.]

WAC 480-100-378 Accuracy of test standards. (1) Electrical utilities must provide the commission with a written statement of their practices under these rules covering:

(a) A description of test standards and meter testing equipment, if maintained by the electrical utility;
(b) A description of methods employed to ascertain and maintain the accuracy of the test standards and meter testing equipment, including the frequency of such tests, if the electrical utility chooses to maintain its own such standards and equipment rather than use the services of a certified testing laboratory.

(2) If an electrical utility chooses to maintain its own test standards and meter testing instruments, it must retain records showing the date when each test standard and each meter testing instrument was tested, calibrated, or adjusted. Test standards must not be used in the field as working instruments.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-378, filed 5/3/01, effective 6/3/01.]

WAC 480-100-383 Reports of accidents. Each electric utility must notify the commission orally or by electronic mail no later than the second business day following discovery of any accident that results in death or serious injury to any person occurring in its plant or through electrical contact with its facilities. Electric utilities must submit a follow-up written report to the commission within fifteen business days of initial notification that includes, at a minimum:

- (1) The name and address of the person or persons injured;
- (2) The time and place of the accident;
- (3) Whether the accident resulted in a fatality;
- (4) A brief description of how the accident occurred; and
- (5) A brief description of any necessary medical treatment that was provided.

[Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-383, filed 5/3/01, effective 6/3/01.]

WAC 480-100-388 Electric service reliability definitions. "Electric service reliability" means the continuity of electric service experienced by retail customers.

"Reliability statistic" means a number, which may include multiple components (for example, service interruptions, customers, and hours), that measures electric service reliability.

"Baseline reliability statistic" means a number calculated by the utility measuring aspects of electric service reliability in a specified year that may be used as a comparison for measuring electric service reliability in subsequent years.

"Sustained interruption" means an interruption to electric service that has a length of duration specified by the electric utility, but in any case not less than one minute.

"Power quality" means characteristics of electricity, primarily voltage and frequency, that must meet certain specifications for safe, adequate and efficient operations.

"Full-system" means all equipment and lines necessary to serve retail customers whether for the purpose of generation, transmission, distribution or individual service.

"Major event" means an event, such as a storm, that causes serious reliability problems, and that meets criteria established by the utility for such an event.

[Statutory Authority: RCW 80.01.040. 01-08-009 (Docket No. UE-991168, General Order No. R-478), § 480-100-388, filed 3/22/01, effective 4/22/01.]

WAC 480-100-393 Electric service reliability monitoring and reporting plan. (1) Who must file. Electric utilities subject to commission jurisdiction must file a plan for monitoring and reporting electric service reliability information to the commission.

(2) When to file. The plan for monitoring and reporting electric service reliability information must be filed with the commission six months after the effective date of this rule, though utilities are encouraged to file the plan sooner. Any modification to the plan must be filed with the commission before the modification is implemented.

(3) What to file. The utility must file a plan for monitoring and reporting electric service reliability information to the commission. The plan, and any modification to it, must be accepted by the commission. The plan must include the following items:

(a) What reliability statistics and information the utility will report to the commission. The utility must select and define statistics that track full-system reliability, and information, which may include statistics, that tracks localized reliability and identifies areas of greatest reliability concern.

(b) When the utility will establish baseline reliability statistics to report to the commission. Prior to establishing baseline reliability statistics, the utility must report the best information available. The utility must establish baseline reliability statistics within three years of the effective date of this rule.

(c) When the utility will file its annual electric service reliability report to the commission.

[Statutory Authority: RCW 80.01.040. 01-08-009 (Docket No. UE-991168, General Order No. R-478), § 480-100-393, filed 3/22/01, effective 4/22/01.]

WAC 480-100-398 Electric service reliability reports. The electric utility must file an electric service reliability report with the commission at least once a year. The report must meet the following conditions:

(1) The report must be consistent with the electric service reliability monitoring and reporting plan filed under WAC 480-100-393. As set forth in the plan, in an identified year, baseline reliability statistics must be established and reported. In subsequent years, new reliability statistics must be compared to the baseline reliability statistics and to reliability statistics from all intervening years. The utility must maintain historical reliability information necessary to show trends for a minimum of seven years.

(2) The report must address any changes that the utility may make in the collection of data and calculation of reliability information after initial baselines are set. The utility must explain why the changes occurred and explain how the change is expected to affect comparisons of the newer and older information. Additionally, to the extent practical, the utility must quantify the effect of such changes on the comparability of new reliability statistics to baseline reliability statistics.

(3) The report must identify the utility's geographic areas of greatest reliability concern, explain their causes, and explain how the utility plans to address them.

(4) The report must identify the total number of customer complaints about reliability and power quality made to the utility during the year, and must distinguish between complaints about sustained interruptions and power quality. The report must also identify complaints that were made about major events.

[Statutory Authority: RCW 80.01.040. 01-08-009 (Docket No. UE-991168, General Order No. R-478), § 480-100-398, filed 3/22/01, effective 4/22/01.]

PART 6--ADOPTION BY REFERENCE

WAC 480-100-999 Adoption by reference. In this chapter, the commission adopts by reference all or portions of regulations and standards identified below. They are available for inspection at the commission branch of the Washington state library. The publications, effective date, references within this chapter, and availability of the resources are as follows:

(1) Title 18 Code of Federal Regulations, cited as 18 CFR, is published by the United States Government Printing Office.

(a) The commission adopts the version in effect on April 1, 2002.

(b) This publication is referenced in WAC 480-100-203, Accounting system requirements and WAC 480-100-208, Financial reporting requirements;

(c) Copies of 18 CFR are available from the U.S. Government Printing Office in Pittsburgh, Pennsylvania.

(2) The *Regulations to Govern the Preservation of Records of Electric, Gas, and Water Companies* is published by the National Association of Regulatory Utility Commissioners (NARUC).

(a) The commission adopts the version in effect in 1985.

(b) This publication is referenced in WAC 480-100-228, Retention and preservation of records and reports.

(c) The *Regulations to Govern the Preservation of Records of Electric, Gas, and Water Companies* is a copyrighted document. Copies are available from NARUC, in Washington, D.C.;

(3) The National Electrical Code is published by the National Fire Protection Association (NFPA).

(a) The commission adopts the version published in 2002.

(b) This publication is referenced in WAC 480-100-163, Service entrance facilities;

(c) The National Electrical Code is a copyrighted document. Copies are available from the NFPA, in Quincy, Massachusetts.

(4) The American National Standard for Electric Meters: Code for Electricity Metering, ANSI C12.1 is published by the American National Standards Institute.

(a) The commission adopts the version published in 2001.

(b) This publication is referenced in WAC 480-100-318, Meter readings, multipliers, and test constants; WAC 480-100-338, Accuracy requirements for electric meters; and WAC 480-100-343, Statement of meter test procedures.

(c) The ANSI C12.1 is a copyrighted document. Copies are available from Global Engineering Documents in Englewood, Colorado.

[Statutory Authority: RCW 80.01.040, 80.04.160, 81.04.160 and 34.05.353. 02-18-033 (Docket No. A-020379, General Order No. R-501), § 480-100-999, filed 8/26/02, effective 9/26/02. Statutory Authority: RCW 80.01.040 and 80.04.160. 01-11-004 (Docket No. UE-990473, General Order No. R-482), § 480-100-999, filed 5/3/01, effective 6/3/01.]