

Chapter PSC 113

SERVICE RULES FOR ELECTRICAL UTILITIES

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PSC 113.01 Application of rules. (1) All public utilities, whether privately or municipally owned or operated, in respect to the supply of electric energy and provision of electric service in this state, shall comply with and conform to rules set forth in this order except insofar as exception may be made by order of the commission as hereinafter mentioned.

(2) Nothing in this chapter of the Wisconsin Administrative Code shall preclude special and individual consideration being given to exceptional or unusual situations and upon due investigation of the facts and circumstances therein involved, the adoption of requirements as to individual utilities or services which shall be lesser, greater, other, or different than those provided in said rules.

History: 1-2-56;am. (2), Register, October, 1965, No. 118, eff. 11-1-65.

PART I

MISCELLANEOUS SERVICE REQUIREMENTS

PSC 113.015 General requirement. Every utility shall furnish reasonably adequate service and facilities at the rates filed with the commission and subject to these rules and the rules of the utility applicable thereto and not otherwise. The energy shall be generated, transmitted, converted, and distributed by the utility, and utilized, whether by the utility or the customer, in such manner as to obviate so far as reasonably practicable undesirable effects upon the operation of standard services or equipment of the utility, its customers, or other utilities or agencies.

Note: As used in these rules the terms "rules of the utility" or "utility's rules" means the rules of the utility on file with the commission.

PSC 113.03 Inspection of structures and equipment. Each pole, post, tower, structure, conductor, or guy used for the support or attachment of electrical conductors or lamps owned or used by a utility shall be inspected with reasonable frequency and all major equipment shall be inspected periodically by the utility to determine its fitness for service and the necessity for replacement or repair.

PSC 113.04 Servicing utilization control equipment. (1) Utilities shall service and maintain any equipment they use on customers' premises and shall adjust thermostats, clocks, relays, or time switches, if such devices must be so adjusted to provide service in accordance with the rate provisions.

(2) The time switches used by the utility for controlling equipment such as water heaters, street lights, etc., shall be of such quality that the timing mechanism may be adjusted so as to be accurate within 10 minutes per month. Time switches used by the utility for controlling street lighting or display lighting shall be inspected or operation observed at least once each 3 months and if in error, adjusted, and also adjusted

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upon complaint if found in error or when service interruptions cause them to be in error by one-half hour or more. Time switches used by the utility for controlling off-peak appliances shall be inspected or operation observed when the utility reads the meter and when the meter is tested and adjusted if in error, and also adjusted upon complaint if found in error or whenever service interruptions result in error of 2 hours or more or in supplying service to off-peak appliances during peak periods.

(3) Load-control systems utilizing a central signaling source to operate equipment on the customers' premises for directly or indirectly controlling customer loads shall be tested as follows:

(a) The central signaling source shall be tested for proper signal output in accordance with procedures as filed with and accepted by the commission.

(b) The receiver-control devices at the customers' premises shall be tested according to procedures as filed with and accepted by the commission. At the minimum such tests shall include an annual sample testing of the various types of devices in use (sufficient to determine whether each of the various types of devices is performing satisfactorily), and a test of any unit suspected to have failed or which is the subject of a customer complaint.

(c) Each utility shall file with the commission appropriate test procedures in accordance with preceding paragraphs (a) and (b) within 12 months after placing each load-control system in use. The initial filing may consist of temporary procedures to be observed until the capabilities of the particular system are determined from experience.

(4) Other control devices used by the utility to control loads shall be checked periodically.

History: 1-2-56; am. (2), r. and recr. (3) and cr. (4), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.05 Relocation of poles. (1) When a utility is required by governmental authority or requested by customers to move poles, as, for example, from streets to alleys, the utility is not required to furnish new service entrance conductors, cable, conduit, or service equipment unless it makes a practice of supplying this equipment. It shall, however, run a service drop to the nearest point on each building served from the new location and remove the old service drop without expense to the customer.

(2) If the utility moves its poles of its own volition the utility shall supply new service entrance conductors, cable, conduit, interior wiring connection, and service equipment, and remove the old; or shall attach its system to the existing service entrance conductors without expense to the customer.

PSC 113.055 Protection of utility facilities. A public utility upon receiving notice as provided in section 66.047 or section 182.0175 (2) (e), Stats., of work which may affect its facilities used for serving the public shall:

(1) If the notice is of work covered by section 66.047, Stats., investigate and decide what action, if any, must reasonably be taken to protect or alter utility facilities in order to protect service to the public and to

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avoid unnecessary damage. The utility shall take such action as is reasonably necessary to protect, remove, alter, or reconstruct its facilities, and shall perform such work with reasonable dispatch taking into account the conditions to be met. Nothing in this rule shall be deemed to affect any right which the utility may have to require advance payment or adequate assurance of payment of the reasonable cost thereof to the utility by the property owner or contractor.

(2) If the notice is of work covered by section 182.0175 (2) (e), Stats., and is not covered by section 66.047, the utility shall respond as required by section 182.0175 (2) (e).

(3) The utility may, in order to protect its interests, require that the owner or contractor perform certain work upon that part of the service piping or wiring on or being removed from the property upon which the excavating, building, or wrecking operations are being performed.

(4) This rule is not intended to affect the responsibility of the contractor or owner, or the liability or legal rights of any party.

History: Cr. Register, June, 1962, No. 78, eff. 7-1-62; am. intro. par., Register, October, 1965, No. 118, eff. 11-1-65; r. and recr. (intro.), (1) and (2), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.057 Interference with public service structures. (1) A utility having any work upon, over, along, or under any public street, highway or private property near existing utility facilities shall give reasonable notice to the other utility and shall exercise care when working in close proximity to such existing facilities. Sections 66.047 and 182.0175, Stats., shall be observed where applicable. In all other cases such notice shall provide the other utility with a reasonable opportunity to protect or alter its facilities and such work shall not proceed without an agreement concerning the location and nature of the proposed work.

(2) Nothing in the above shall prevent a utility from proceeding as quickly as possible with any emergency construction work which might interfere with existing facilities. (Also see sec. 182.0175 (2) (d), Stats.)

History: Cr. Register, October, 1965, No. 118, eff. 11-1-65; r. and recr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.06 Standard voltages and utilization equipment. (1) All utilities shall have available a tabulation showing the character and type of electric service supplied, including the secondary and, where applicable, primary voltages.

(2) Lamps used or furnished by the utility for highway or area illumination shall initially be such that the customer receives the proper illumination in lumens specified in the rate. If the street lighting rate is based on wattage, or if the utility furnishes lamps to customers free or at reduced cost, the lamp bulbs shall be of such efficiency in lumens per watt when used on the utility's circuits that customers may obtain their lighting service under the most favorable conditions practicable under the rate schedule.

History: 1-2-56; am. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.07 Tamper-resistant equipment. Where electrical energy has been diverted or the utility's equipment for measuring the service or controlling a customer's load has been interfered with, the utility may

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require the customer to install entrance and service equipment to prevent current diversion or interference with the metering or control equipment.

Note: Care should be taken in determining the existence of diversion and amount of energy diverted. In case check-meters are used, the possibility of grounds between meters, normal meter inaccuracies, and incorrect connections of meters should not be overlooked. The requirements of the Wisconsin state electrical code for entrances should effectively prevent such diversion. Attention is directed to sections 939.32 and 943.20, Stats.

History: 1-2-56; am. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.08 Power-factor correction of gaseous tube lighting. When fluorescent, neon, zeon, or other hot or cold cathode types of gaseous tube lighting having similar power-factor characteristics are installed as the major lighting source, the customer shall furnish, install, and maintain at his own expense corrective apparatus designed to maintain at not less than 90% lagging the power-factor of individual lighting unit or the entire lighting installation.

History: 1-2-56; r. and recr., Register, October, 1965, No. 118, eff. 11-1-65.

PSC 113.09 Change in type of service. (1) If a change in type of service, such as from 25 to 60 hertz, or a change in voltage to a customer's substation, is effected at the insistence of the utility and not solely by reason of increase in the customer's load or change in the character thereof, the utility shall share equitably in the cost of changing the equipment of the customers affected as determined by the commission in the absence of agreement between utility and customer.

Note: The change in customer's equipment should be made with the greatest possible economy to the customer, and final settlement made at the time of the change. Substantially the following basis was prescribed by the commission in *Jackman v. Jonesville Electric Co.*, 17 W.R.C.R. 356, and has been customarily adopted as the basis for settlement:

Payment by the utility to the customer of:

1. The remaining value of the customer's electrical equipment which is made obsolete;
2. The cost of making the resulting necessary change in interior wiring; and
3. The cost of installing the new equipment and removing the old, less the salvage value of such equipment as the customer retains.

(2) If a utility changes its standard voltage it shall notify customers in advance and if customer equipment other than lamps must be changed, an adjustment as required in subsection (1) hereof shall be made. If tests of a representative sample of customers' meters indicate that meters have started to creep because of the voltage increase or if the tests of the representative sample show that meters average more than 0.5% fast, meters affected by the change in voltage shall be tested and adjusted.

History: 1-2-56; am. (1), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.10 Connection of motor-generator-type welders. The connection of motor-generator-type welders shall be governed by the utilities' rules covering the connection of motors.

PSC 113.101 Connection of other than motor-generator-type welders. (1) Each welder shall be provided with a name plate showing:

- (a) Name of manufacturer.
- (b) Manufacturer's type designation and serial number.
- (c) Frequency.

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- (d) Primary volts.
- (e) Maximum input (primary) amperes (at rated output amperes).
- (f) Output volts at rated output amperes.
- (g) Rated output amperes.
- (h) Rated duty cycle or time rating.
- (i) Temperature rise in degrees C.
- (j) Open-circuit voltage.

(2) Each welder shall be provided with a proper disconnecting means, and shall be constructed, installed, and maintained in a manner which does not conflict with the requirements of the Wisconsin state electrical code.

(3) The consent of the utility shall be obtained and any changes in the customer's wiring and in the utility's facilities, necessary to permit welder operation under safe conditions and without interference to the service of other customers, shall be completed before any electrical welder is connected.

(4) Where the utility's distribution facilities supplying the customer using a welder are reasonably adequate and of sufficient capacity to carry other loads normally imposed, variations in the voltage of the utility's supply to such customer caused by his welder in excess of the limits set in sections PSC 113.25, 113.26 and 113.27 shall not be considered a violation of such order by the utility.

(5) Electric welders not larger than the sizes set forth below and used under the conditions specified shall be served without charges other than applicable to the customer's other service on the same circuit.

(a) All classes of customers in any area. 110-120 or 220-240 volt electrical welders which can be operated on circuits fused at not to exceed 15 amperes and without causing violations of sections PSC 113.25, 113.26 and 113.27 at other customers' service entrances on a reasonably adequate secondary.

(b) Commercial customers irrespective of location and customers residing in areas where service generally is supplied from individual distribution transformers.

1. 220-240 volt electric arc welders having a rated-maximum operating input current of not to exceed 37.5 amperes with an output-load voltage of 25 volts at an input of 230 volts, where the customer agrees to reduce operation of other electrical equipment to a minimum during periods the welder is in use, and agrees not to use the welder during lighting hours except in case of emergency.

2. Where the welder name plate does not give the rated primary current, the welder primary rated current shall be taken as two-thirds of the maximum final or stable short-circuit current obtainable.

3. The welder transformer used as a part of the welder shall be of the double-winding type, and the secondary shall be thoroughly insulated from the primary.

4. The welders shall not have a final or stable short-circuit current for any current setting exceeding 150% of the rated input current.

(6) Each utility may require that welders not permitted by subsection (5) above be served from a separately metered circuit under rates applicable to that arrangement, or may file an extra charge for serving such welders from the general service circuit, which charge shall be based on the excess of the primary input current of the welder over the allowable input welder current, according to location, permitted under subsection (5) above. The input current shall be taken as two-thirds of the maximum final or stable short-circuit current obtainable.

History: 1-2-56; am. (4) and (5) (a), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.102 Radio and television interference. (1) Each utility shall own or otherwise arrange to have available when needed, suitable monitoring equipment for surveying its lines and equipment for possible radio and/or television interference.

(2) Each utility shall establish and routinely utilize in the course of its regular operation, means whereby the presence of radio and/or television interference may be detected.

(3) Each utility shall, upon notification or detection of the presence of radio and/or television interference, survey its lines and equipment for possible sources of radio and television interference. When significant interference is found, reasonable measures shall be taken to locate the source and, if on the utility's system, to mitigate the interference.

(4) Where the source of interference is determined to be equipment owned by a specific customer, the customer shall be so advised and informed of his responsibility to correct the problem (see PSC 113.015).

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.103 Planned service interruptions. (1) Unless conditions of an actual or potential emergency nature require otherwise, each utility shall strive to give reasonable advance notice to affected customers of each planned service interruption expected to last more than 30 minutes. No such notification is necessary when applying load control or on-peak control systems.

(2) Whenever feasible, interruptions expected to last more than 1 hour and affect more than 100 customers, or interruptions to critical loads, shall be scheduled for periods which will cause a minimum of customer inconvenience.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PART II

REQUIREMENTS AS TO RATE SCHEDULES AND RULES OF THE UTILITY

(See also section PSC 113.25)

PSC 113.11 Schedules to be filed with commission. The schedules of rates and rules to be filed with the commission by the utility shall be classified, designated, arranged, and submitted so as to conform to the requirements of current tariff or rate schedule circulars and special instructions which have been and may from time to time be issued by the commission. Provisions of the schedules shall be definite and so stated as

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to minimize ambiguity or the possibility of misinterpretation, and shall include, together with such other information as may be deemed pertinent, the following:

(1) All rates for service with indication for each rate of the type and voltage of service and the class of customers to which each rate applies. There shall also be shown any limitations on loads and type of equipment which may be connected, the prices per unit of service, and the number of units per billing period to which the prices apply, the period of billing, the minimum bill, method of measuring demands including method of calculating or estimating loads or minimums, and any special terms and conditions applicable. The discount for prompt payment or penalty for late payment, if any, and the period during which the net amount may be paid shall be specified.

(2) By municipalities, but without reference required to any particular part thereof, the voltage at which service will be supplied and the type of service (direct current or single- /or polyphase alternating current).

(3) Forms of standard contracts required of customers for the various types of service available.

(4) If service to other utilities, to electric cooperatives, or municipalities is furnished at a standard filed rate, either a copy of each contract or the standard contract form together with a summary of the provisions of each signed contract. The summary shall show the principal provisions of the contract and shall include the name and address of the customer, the points where energy is delivered, rate, term, minimums, load conditions, voltage of delivery, and any special provisions such as rentals. Standard contracts for such sales as that of energy for resale, street lighting, municipal athletic-field lighting, and for water utilities may be filed in summary form as above outlined.

(5) Copies of special contracts for the purchase, sale, or interchange of energy.

(6) List of villages, cities, and unincorporated communities where urban rates are applicable, and towns in which service is furnished.

(7) The list of service areas and the rates shall be filed in such form as to facilitate ready determination of the rates available in each municipality and in such unincorporated communities as have service at urban rates. If the utility has various rural rates, the areas where the same are available shall be indicated.

(8) Definitions of classes of customers.

(9) Extension rules for extending service to new customers indicating what portion of the extension or cost thereof will be furnished by the utility; and if the rule is based on cost, the items of cost included.

(10) Type of construction required if in excess of the standards required by the Wisconsin state electrical code.

(11) Specification of such portion of service as the utility furnishes, owns, and maintains, such as service drop, service entrance cable or conductors, conduits, service entrance equipment, meter, and socket. Indication of the portions of interior wiring such as range or water-heater connection, furnished in whole or in part by the utility, and statement

indicating final ownership and responsibility for maintaining equipment furnished by utility.

(12) Statement of the type of special construction commonly requested by customers which the utility allows to be connected, and terms upon which such construction will be permitted, with due provision for the avoidance of unjust discrimination as between customers who request special construction and those who do not. This applies, for example, to a case where a customer desires underground service in overhead territory.

(13) Rules with which prospective customers must comply as a condition of receiving service, and the terms of contracts required.

(14) Rules governing the establishment of credit by customers for payment of service bills.

(15) Rules governing the procedure followed in disconnecting and reconnecting service.

(16) Notice by customer required for having service discontinued.

(17) Rules covering temporary, emergency, auxiliary, and stand-by service.

(18) Rules covering the type of equipment which may or may not be connected, including rules such as those requiring demand-limiting devices or power-factor corrective equipment.

PSC 113.115 Forms to be filed. On or before May 1 of each year, all public utilities rendering electric service in Wisconsin who report to the federal power commission on form 12-12A or form 12D shall supply a copy of such report to the public service commission.

History: Cr. Register, March, 1963, No. 87, eff. 4-1-63.

PSC 113.12 Information available to customers. (1) There shall be kept on file in every station and office of the utility where payments are received copies of the rate schedules applicable in such locality. Copies of these rules and such rules of the utility as are applicable shall be kept on file in every general and local office of the utility. Reasonable notice shall be given customers as to where the foregoing information is available to them.

(2) (a) Where a customer is eligible to take service under any one or more of 2 or more rates, the company shall advise the customer in the selection of the rate or rates which result in the lowest cost of service, based on 12 months' service and on the information at hand.

(b) The selection of a rate or rates shall be reviewed every 12 months, whenever there is a change in rates, and whenever a request to do so is received from the customer. The customer shall be notified if any combination of services, change in voltage of delivery, or the installation of any equipment will result in a lower cost of service.

(3) Each electric utility, for every municipality in which it serves, shall provide in the respective telephone directories a telephone listing by which the utility can be notified during a 24-hour day of any utility service deficiency or emergency which may exist.

(4) Where a second language is common in a particular area served by the utility and so identified by the commission, all rules pertaining to

billing and credit shall be available upon customer request, for distribution in English and that second language in every business office of the utility in that area accessible to the public and where customer payments are received.

History: 1-2-56; emerg. cr. (3) and (4), eff. 1-21-75; cr. (3) and (4), Register, January, 1975, No. 229, eff. 2-1-75.

PSC 113.131 Deposits. (1) **NEW RESIDENTIAL SERVICE.** A utility shall not require a cash deposit or other guarantee as a condition of new service unless a customer has an outstanding account balance with the utility which accrued within the last 6 years, and which at the time of the request for new service remains outstanding and not in dispute. (See Wis. Adm. Code section PSC 113.134).

(2) **EXISTING RESIDENTIAL SERVICE.** A utility shall not require a cash deposit or other guarantee as a condition of continued service unless either or both of the following circumstances apply.

(a) The utility has shut off or discontinued the service of the customer within the last 12-month period for violation of the utility's filed rules or for nonpayment of a delinquent service account not currently in dispute.

(b) Subsequent credit information indicates that the initial application for service was falsified or incomplete to the extent that a deposit would be required under this section.

(3) **COMMERCIAL SERVICE.** (a) In the case of commercial service if the credit of an applicant for service has not been established satisfactorily to the utility, he may be required to deposit a sum not exceeding the estimated gross bills for service for any 2 consecutive billing periods selected by the utility.

(b) In the case of commercial service, the deposit shall be refunded after 24 consecutive months of prompt payment, if the customer's credit standing is satisfactory to the utility.

(c) In the case of commercial accounts, payment shall be considered "prompt" if it is made prior to notice of disconnection for nonpayment not in dispute.

(4) **CONDITIONS OF DEPOSIT.** The maximum deposit for a new account shall not exceed the highest estimated gross bill for any 2 consecutive months. Deposits for existing accounts shall not exceed the highest actual gross bill for any 2 consecutive months within the preceding 12-month review period as determined by the utility.

(5) **INTEREST.** Deposits shall bear interest of at least the legal rate, payable from the date of deposit to the date of refund or discontinuance of service, whichever is earlier.

(6) **REVIEW.** The utility shall review the payment record of each residential utility customer with a deposit on file at 12-month intervals. The utility shall not require or continue to require a cash deposit unless a deposit is required under the provisions of section PSC 113.131 (2).

(7) **REFUND.** Any deposit or portion thereof refunded to a customer shall be refunded by check unless both the customer and the utility agree to a credit on the regular billing, or unless subsection (8) applies.

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(8) ACCRUED INTEREST. Upon termination of service, the deposit, with accrued interest shall be credited to the final bill and the balance shall be returned promptly to the customer.

(9) GUARANTEE. A utility shall not require any customer to pay a deposit or establish a guarantee in lieu of deposit without explaining, in writing if requested, why that deposit is being required.

(10) REFUSAL OF SERVICE. Service may be refused or disconnected for failure to pay a deposit request subject to the rules pertaining to disconnection and refusal of service. (Wis. Adm. Code section PSC 113.132).

(11) GUARANTEE TERMS AND CONDITIONS. (a) The utility may accept, in lieu of a cash deposit, a contract signed by a guarantor satisfactory to the utility whereby payment of a specified sum not exceeding the cash deposit requirement is guaranteed. The term of such contract shall be for no longer than 2 years, but shall automatically terminate after the customer has closed his account with the utility, or at the guarantor's request upon 30 days' written notice to the utility.

(b) Upon termination of a guarantee contract or whenever the utility deems same insufficient as to amount or surety, a cash deposit or a new or additional guarantee may be required upon reasonable written notice to the customer. The service of any customer who fails to comply with these requirements may be disconnected upon 8 days' written notice.

(c) The utility shall mail the guarantor copies of all disconnect notices sent to the customer whose account he has guaranteed unless the guarantor waives such notice in writing.

(12) DEFERRED PAYMENT. In lieu of cash deposit or guarantee, an applicant for new service who has an outstanding account accrued within the last 6 years with the same utility shall have the right to receive service from that utility under a deferred payment agreement as defined in Wis. Adm. Code section PSC 113.133 for the outstanding account.

(13) APPLICABILITY. The rules in subsections (11) and (12) of this section are not applicable to deposits or guarantees made in connection with the financing of extensions or other equipment.

History: Emerg. cr. eff. 1-21-75; cr. Register, January, 1975, No. 229, eff. 2-1-75.

PSC 113.132 Disconnection and refusal of service. (1) (a) In no circumstances will the cumulative time before notice of disconnection be less than 20 days after the date of issuance of the bill and an account may be deemed delinquent for the purpose of disconnection after such period has elapsed.

(b) At least 8 calendar days prior to disconnection, the utility shall give written disconnect notice upon a form which must be in the tariff of the utility filed with the public service commission and which conforms to the requirements of Wis. Adm. Code section PSC 113.132 (9) unless excepted elsewhere.

(c) When a customer, either directly or through the public service commission, disputes a disconnection notice the utility shall investigate any disputed issue and shall attempt to resolve that issue by negotiation. During this investigation and negotiation, utility service shall not be disconnected over this matter.

(d) If a disputed issue cannot be resolved pursuant to Wis. Adm. Code section PSC 113.134 (1), the utility shall inform the customer of the right to contact the public service commission.

(2) Utility service may be disconnected or refused for any of the following reasons:

(a) Failure to pay a delinquent account or failure to comply with the terms of a deferred payment agreement. (See Wis. Adm. Code section PSC 113.133)

(b) Violation of the utility's rules pertaining to the use of service in a manner which interferes with the service of others or to the operation of non-standard equipment, if the customer has first been notified and provided with reasonable opportunity to remedy the situation.

(c) Failure to comply with deposit or guarantee arrangements as specified in Wis. Adm. Code section PSC 113.131.

(d) Diversion of service around the meter.

(3) A public utility may disconnect utility service without notice where a dangerous condition exists for as long as the condition exists.

(4) Service may be denied to any customer for failure to comply with applicable requirements of this section, or of the utility's rules, or with section 167.16, Wis. Stats.; or if the customer proposes to use a device that is not so designed that interference with communication and signal services is reasonably minimized.

(5) A utility is not required to furnish service under conditions requiring operation in parallel with generating equipment connected to the customer's system if such operation is hazardous or may interfere with its own operations or service to other customers or with service furnished by others. The utility may specify requirements as to connection and operation as a condition of rendering service under such circumstances.

(6) Utility service may not be disconnected or refused for any of the following reasons:

(a) Nonpayment of a delinquent account over 6 months old where collection efforts have not been made within that period of time unless the passage of additional time results from other provisions herein or from good faith negotiations or arrangements made with the customer.

(b) Delinquency in payment for service by a previous occupant of the premises to be served other than a member of the same household residing at the same premises.

(c) Failure to pay for merchandise or charges for non-utility service billed by the utility.

(d) Failure to pay for a different type of class of utility service.

(e) Failure to pay the account of another customer as guarantor thereof.

(f) Failure to pay charges arising from any underbilling occurring more than one year prior to the current billing and due to any misapplication of rates.

(g) Failure to pay charges arising from any underbilling occurring more than one year prior to the current billing and due to any faulty metering.

(h) Failure to pay an estimated bill other than a bill rendered pursuant to an approved bimonthly meter reading plan, unless the customer upon request refuses to permit the reading of the meter during normal business hours.

(7) A utility shall not disconnect any residential service without notifying the county department of health and social services at least 5 calendar days prior to the scheduled disconnection, if the customer or responsible person has made a written request for this procedure to the utility. The customer shall be appraised of this right upon application for service.

(8) Notwithstanding any other provision of this section, a utility may not disconnect service to a residential customer if disconnection will aggravate an existing medical emergency of the customer, a member of his family or other permanent resident of the premises where service is rendered and if the customer conforms to the procedures described in paragraph (a) below.

(a) A utility shall postpone the disconnection of service for 21 days to enable the customer to arrange for payment, if the customer produces a licensed Wisconsin physician's statement or notice from a public health or social services official which identifies the medical emergency and specifies the period of time during which disconnection will aggravate the circumstances. The postponement may be extended once by renewal of the certificate or notice. No further extension of time shall be granted except upon a showing by the customer of the existence of extraordinary circumstances and further that he has exercised due diligence in meeting the emergency as evidenced in part by close and continuous communication with the utility.

(b) During the period service is continued under the provisions of this subsection, the customer shall be responsible for the cost of residential utility service. However, no action to disconnect that service will be undertaken until expiration of the period of continued service.

(c) If there is a dispute concerning an alleged existing medical emergency, either party shall have the right to an informal review by the public service commission staff. Pending a decision after informal review, residential utility service shall be continued provided that the resident has submitted a statement or notice as set forth in paragraph (a) of this subsection.

(9) (a) A utility shall not disconnect service unless written notice by first class mail is sent to the customer or personally served at least 8 calendar days prior to the first date of the proposed disconnection. Notice shall be sent to the account name and address, and to the address where service is provided, if different. If disconnection is not accomplished on or before the 15th day after the first notice date, a subsequent notice must be left on the premises not less than 24 hours nor more than 48 hours prior to disconnection.

(b) The utility shall make a reasonable effort to have a personal or telephone contact with the customer prior to disconnection.

(c) Disconnection notice shall be given upon a form approved by the commission, and shall contain the following information:

1. The name and address of the customer and the address of the service, if different.

2. A statement of the reason (s) for the proposed disconnection of service and that disconnection will occur if the account is not paid, or if arrangement is not made to pay the account under deferred agreement, or if other suitable arrangements are not made, or if equipment changes are not made. If disconnection of service is to be made for default on a deferred payment agreement, the notice shall include an explanation of the acts of the customer which are considered to constitute default.

3. A statement that the customer should communicate immediately upon receipt of the notice with the utility's designated office, listing a telephone number, if he disputes the notice of delinquent account, if he wishes to negotiate a deferred payment agreement as an alternative to disconnection, if any resident is seriously ill, or if there are other extenuating circumstances.

4. A statement that residential utility service will be continued for up to 21 days during serious illness if the account holder submits a statement or notice pursuant to Wis. Adm. Code section PSC 113.132 (8).

5. A statement that the customer may appeal to the public service commission staff in the event that the grounds for the proposed disconnection or the amount of any disagreement remains in dispute after the customer has pursued the available remedies with the utility.

(10) (a) Service shall not be disconnected on a day, or on a day immediately preceding a day, when the business offices of the utility are not available to the public for the purpose of transacting all business matters unless the utility provides personnel which are readily available to the customer 24 hours per day to evaluate, negotiate or otherwise consider the customer's objection to the disconnection as provided under Wis. Adm. Code section PSC 113.134, and proper service personnel are readily available to restore service 24 hours per day.

(b) If a residential service which has been disconnected has not been restored to service within 24 hours after the time of the disconnection, the utility shall inform the local law enforcement department of the billing name and the service address and that threat to health and life might exist to persons occupying the premises.

History: Emerg. cr. eff. 1-21-75; cr. Register, January, 1975, No. 229, eff. 2-1-75; am. (1) (a) and (6) (a), Register, December, 1975, No. 240, eff. 1-1-76.; emerg. am. (2) (a), eff. 1-19-76; emerg. am. (2), eff. 12-6-77.

PSC 113.133 Deferred payment agreement. The utility is required to offer deferred payment agreements only to residential accounts.

(1) Every deferred payment agreement entered into due to the customer's inability to pay the outstanding bill in full shall provide that service will not be discontinued if the customer pays a reasonable amount of the outstanding bill and agrees to pay a reasonable portion of the remaining outstanding balance in installments until the bill is paid.

(2) For purposes of determining reasonableness under these rules the parties shall consider the:

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- (a) Size of the delinquent account.
- (b) Customer's ability to pay.
- (c) Customer's payment history.
- (d) Time that the debt has been outstanding.
- (e) Reasons why debt has been outstanding.
- (f) Any other relevant factors concerning the circumstances of the customer.

(3) A deferred payment agreement offered by a utility shall state immediately preceding the space provided for the customer's signature and in bold face print at least 2 sizes larger than any other used thereon, that "IF YOU ARE NOT SATISFIED WITH THIS AGREEMENT, DO NOT SIGN. IF YOU DO SIGN THIS AGREEMENT YOU GIVE UP YOUR RIGHT TO DISPUTE THE AMOUNT DUE UNDER THE AGREEMENT EXCEPT FOR THE UTILITY'S FAILURE OR REFUSAL TO FOLLOW THE TERMS OF THIS AGREEMENT."

(4) A deferred payment agreement shall not include a finance charge.

(5) If an applicant for utility service has not fulfilled terms of a deferred payment agreement, the utility shall have the right to disconnect pursuant to disconnection of service rules (Wis. Adm. Code section PSC 113.132) and under such circumstances it shall not be required to offer subsequent negotiation of a deferred payment agreement prior to disconnection.

(6) Any payments made by a customer in compliance with a deferred payment agreement or otherwise shall first be considered made in payment of the previous account balance with any remainder credited to the current bill.

History: Emerg. cr. eff. 1-21-75; cr. Register, January, 1975, No. 229, eff. 2-1-75.

PSC 113.134 Dispute procedures. (1) Whenever the customer disputes the utility's request for a deposit or other guarantee, or advises the utility's designated office prior to the disconnection of service that all or any part of any billing as rendered is in dispute, or that any matter related to the disconnection or refusal of service is in dispute, the utility shall:

- (a) Investigate the dispute promptly and completely.
 - (b) Advise the customer of the results of the investigation.
 - (c) Attempt to resolve the dispute.
 - (d) Provide the opportunity for the customer to enter into a deferred payment agreement when applicable in order to settle the dispute.
- (2) After the customer has pursued the available remedies with the utility, he may request that the public service commission staff informally review the disputed issue and recommend terms of settlement.

(a) A request for informal review may be made in any reasonable manner such as by written notice or telephoned request directed to the public service commission.

(b) There must be at least 5 days between the date the commission staff mails written notice of terms of settlement after informal review, and any subsequent disconnection.

(3) Any party to the dispute after informal review may make a written request for a formal review by the commission. Such request must be made within 5 days of the date the commission staff mails written notice of terms of settlement after informal review.

(a) Within 10 days from the time such a request is made, the commission shall decide on the basis of the information it has received from the staff whether to hold hearing on the matter and shall inform both parties of its decision.

(b) If the commission decides to conduct formal hearing on the dispute, the customer shall be required to pay 50% of the bill or deposit in dispute to the utility or post bond for that amount on or before date of hearing. Such payment or bond may be waived by the commission for good cause shown. Failure to pay the specified amount before hearing will constitute waiver by the customer.

(c) Such a hearing shall conform to the procedures described in sections 196.26 to 196.34, Wis. Stats.

(d) Any such hearing shall be held not less than 10 days following a notice of hearing and a decision thereon shall be rendered following the conclusion of the hearing.

(4) Utility service shall not be disconnected or refused because of any disputed matter while the disputed matter is being pursued in accordance with the provisions of this section. In no way does this relieve the customer from obligation of paying charges which are not in dispute.

History: Emerg. cr. eff. 1-21-76; cr. Register, January, 1976, No. 229, eff. 2-1-76; am. (1), (3) (b) and (4), Register, December, 1976, No. 240, eff. 1-1-76.

PSC 113.14 Limiting connected load. If the utility maintains a rate based on connected load, provision shall be made in its rules whereby the customer may arrange his load or wiring in such manner as is reasonably acceptable to the utility, whether by the use of double-throw switches or such other devices as may be approved by the utility, so that only a portion of the load may be served at one time and whereby, in such cases, the connected load to be used for the computation of charges shall be the largest load which can be served at any one time.

PART III

CHARGES AND BILLING

PSC 113.15 Meter readings and billing periods. Readings of all meters used for determining charges to customers shall be scheduled monthly, bimonthly, quarterly, or semiannually. An effort shall be made to read meters on corresponding days of each meter-reading period. The meter-reading date may be advanced or postponed not more than 5 days without adjustment of the billing for the period. Bills for service shall be rendered within 40 days from the reading of the meter except as may be otherwise specifically authorized by the commission. The utility may permit the customer to supply the meter readings on a form supplied by the utility, provided a utility representative reads the meter at least once each 6 months and when there is a change of customer.

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PSC 113.16 Billing. (1) (a) Each bill, including the customer's receipt, shall show the present and last preceding meter readings, the date of the present reading, the number of units consumed, the class of service if other than residential, and the rate schedule under which the bill is computed. In lieu of including the rate schedule on the bill the utility may, whenever a rate change becomes effective and at least twice a year, supply each customer with the schedule of rates at which the bills are computed and any other rates that might be applicable. Bills rendered at rates requiring the measurement of a number of different factors shall show all data necessary for the customer to check the computation of the bill. Minimum and estimated bills shall be distinctly marked as such.

(b) If the utility is authorized to make late payment charges, such charges shall comply with the following requirements.

1. The bill shall clearly indicate the amount of the late payment charge and the date after which the late payment charge shall be applied.

2. Late payment charges shall be applied no sooner than 20 days after the date of issuance of the bill.

3. The amount of the late payment charge shall be 3% of the bill, except a minimum charge of 30¢ shall apply.

4. Late payment charges shall be applied to all customer classes and rate classifications.

5. The utility shall not waive any properly applied late payment charges.

6. A late payment charge shall be applied only once to any given amount outstanding.

Note: The public service commission in its order adopting the revision to PSC 113.16 (1) states that "all public utilities operating in Wisconsin shall be in compliance with all of the rules adopted herein not later than 180 days after said rules become effective [9-1-76]."

(2) (a) If the billing period is longer or shorter than allowed in section PSC 113.15, the bill shall be prorated on a daily basis unless other provision is made in the utility's filed rules.

(b) If the utility reads the meters at the end of each billing period, the utility may, or if requested by the customer shall, leave meter reading forms when access to meters cannot be gained. If no form is left or the form is not returned in time for the billing operation, a minimum or estimated bill may be rendered. In cases of emergency, the utility may render minimum or estimated (average) bills without reading meters or supplying meter-reading forms to customers. Only in unusual cases or when approval is obtained from the customer shall more than 3 consecutive estimated bills be rendered.

(c) If the utility schedules the reading of meters less frequently than once each billing period, the utility, unless otherwise requested by the customer, shall supply meter-reading forms for the periods when the meter is not scheduled to be read. If the customer fails to return the meter-reading form or has informed the utility he does not wish to supply a reading, a minimum or estimated bill may be rendered.

(d) If an estimated bill appears to be abnormal when a subsequent reading is obtained, the bill for the entire period shall be computed at a

rate which contemplates the use of service during the entire period and the estimated bill shall be deducted. If there is reasonable evidence that the use occurred during only one billing period, the bill shall be so computed.

(3) (a) Credits due a customer because of meter inaccuracies, errors in billing, or misapplication of rates shall be shown separately and identified.

(b) The original billing rendered because of meter inaccuracy, or errors in billing, shall be separated from the regular bill and the charges explained in detail. Subsequent to the first billing the amount can be shown as a separate item on the regular bill.

(4) At the end of each billing period the utility shall read all prepayment meters, calculate the customer's bill at the regular net rates applicable, report the amount of money in the meter, and bill, refund, or credit the account with the difference between the bill at the regular rates and the amount collected, provided the same customer has received service during the entire billing period. Credits shall be liquidated at least once a year and upon termination of service.

(5) Each bill for service shall be computed at the proper filed rate and the rate used shall be the cheapest applicable rate based on 12 months' use of service. If the customer's use is such that it is difficult to be certain what rate should be applied until there has been 12 months' use, the billing shall be adjusted on the 12th bill.

(a) This rule does not prohibit contracts having terms longer than 1 year but does require that the rates in such contracts be the lowest on file with the commission.

(b) This rule applies to service as it is being supplied. If the customer could reduce his bills by installing equipment, combining or separating services, he should be notified as required by section PSC 113.12 (2), but no change in rates shall be made until the customer makes the necessary changes.

History: 1-2-56; r. and recr. (1), Register, August, 1976, No. 248, eff. 9-1-76.

PSC 113.17 Adjustment of bills for metering inaccuracies. (1) Whenever a meter creeps or whenever a varhour meter or wathour meter installation, with or without pulsing devices and recording equipment, is found upon test to have an average error of more than 2% from 100%, or a demand metering installation more than 1.5% plus the errors allowed in section PSC 113.41 from 100%, a recalculation of bills for service shall be made for the period of inaccuracy. The recalculation shall be made on the basis that the service meter should be 100% accurate with respect to the working test standard.

Note: (See PSC 113.435 Determination of average meter error.)

(2) (a) If the period of inaccuracy cannot be determined, it shall be assumed that the metering equipment has become inaccurate at a uniform rate since it was installed or last tested except as otherwise provided in (b) and (c) below.

(b) Recalculation of bills shall be on the basis of actual bills except that if the monthly consumption has been reasonably uniform, averaged less than 500 kW hrs. per month and involves no billings other than for kW hrs., the recalculation of bills may be based on the average monthly

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consumption and the inaccuracy may be assumed to have existed for a period equal to one-half the time elapsed since the meter was installed or since the last previous test, whichever is later.

(c) The error in registration due to "creep" shall be calculated by timing the rate of "creeping" and assuming that this creeping affected the registration of the meter for 25% of the time since the last test or since the meter was installed.

(d) When the average error cannot be determined by test because of failure of part or all of the metering equipment, it shall be permissible to use the registration of check-metering installations, if any, or to estimate the quantity of energy consumed based on available data.

(3) If the recalculated bills indicate that more than \$1 is due an existing customer or \$2 is due a person no longer a customer of the utility, the full amount of the calculated difference between the amount paid and the recalculated amount shall be refunded to the customer. The refund to an existing customer may be in cash or as credit on a bill. If a refund is due a person no longer a customer of the utility, a notice shall be mailed to the last known address and the utility shall upon demand made within 3 months thereafter refund the amount due.

(4) If the recalculated bills indicate that more than \$10 is due, the utility may bill the customer for the amount due. For residential customers the period of backbilling shall not exceed 24 months unless there is evidence of fraud or deception.

(5) A classified record shall be kept of the number and amount of refunds and charges made because of inaccurate meters, misapplication of rates, and erroneous billing. The record for a calendar year shall be submitted to the commission by April 1 of the following year.

History: 1-2-56; am. (5), Register, October, 1965, No. 118, eff. 11-1-65; am. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.18 Billings for grounds. Subject to the utility's rules setting forth the method of determining a reduced rate herein authorized, if an accidental ground is found on a customer's wiring or equipment, the utility may estimate the kilowatt-hours so lost and bill for them at a reduced rate not less than the generated or purchase cost of the energy, but no such adjustment shall be made for energy supplied after the customer has been notified and has had an opportunity to correct the condition. Any demand (kilowatt) caused by an accidental ground may be billed at a rate lower than that filed for the class of service involved. The utility shall notify the customer of the ground whenever it is found or suspected.

PART IV

UTILITY RECORDS AND INTERRUPTIONS OF SERVICE

(See also sections PSC 113.29, 113.42, 113.43 and 113.45)

PSC 113.19 Employees authorized to enter customers' premises. The utility shall keep a record of employees authorized pursuant to section 196.171, Wis. Stats., to enter customers' premises.

PSC 113.20 Maps and diagrams. Each utility shall have record systems (maps, records, diagrams, drawings or computer display systems)

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showing the location of its property, in sufficient detail so that the adequacy of service to existing customers may be checked and facilities located.

History: 1-2-56; am. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.21 Customers' complaints. Each utility shall investigate and keep a record of complaints received by it from its customers in regard to safety, service, or rates, and the operation of its system. The record shall show the name and address of the complainant, the date and nature of the complaint, and its disposition and the date thereof.

PSC 113.22 Interruptions of service. (1) Each utility shall keep a record of all interruptions to service affecting the entire distribution system of any single community or an important division of a community, and include in such record the location, date and time of interruption, the duration, the approximate number of customers affected, the circuit or circuits involved, and, when known, the cause of each interruption.

(2) When complete distribution systems or portions of communities have service furnished from unattended stations, these records shall be kept to the extent practicable. The record of unattended stations shall show interruptions which require attention to restore service, with the estimated time of interruption. Breaker or fuse operations affecting service should also be indicated even though duration of interruption may not be known.

(3) Each utility shall notify the commission of any event described in (a), (b), (c), (d) or (e) involving bulk power supply facilities (any generating unit or electric facilities operating at a nominal voltage of 69 kV or higher):

(a) Any interruption or loss of service to customers for 15 minutes or more to aggregate firm loads in excess of 200,000 kW. Such notification shall be made by telephone as soon as practicable without unduly interfering with service restoration and, in any event, within one hour after beginning of the interruption. A confirming written report shall be submitted within two weeks.

(b) Any interruption or loss of service to customers for 15 minutes or more to aggregate firm loads exceeding the lesser of 100,000 kW or half of the current annual system peak load and not required to be reported under (a). Such notification shall be made by telephone no later than the beginning of the commission's next regular work day after the interruption occurred. A confirming written report shall be submitted within two weeks.

(c) Any decision to issue a public request for reduction in use of electricity. Notification of such decision shall be made by telephone at the time of issuing such request. A confirming written report shall be submitted within 2 weeks.

(d) Any action to reduce firm customer loads by reduction of voltage for reasons of maintaining adequacy of bulk electric power supply. Notification of such action shall be made by telephone at the time of taking such action. A confirming written report shall be submitted within 2 weeks.

(e) Any action to reduce firm customer loads by manual switching, operation of automatic load shedding devices, or any other means for

reasons of maintaining adequacy of bulk electric power supply. Notification of such action shall be made by telephone at the time of taking such action.

(4) Each utility shall notify the commission of service interruptions not involving bulk power supply facilities as follows:

(a) Interruptions of 60 minutes or more to an entire distribution substation bus or entire feeder serving either 500 or more customers or entire cities or villages having 200 or more customers shall be reported within 2 weeks by a written report.

(5) The written reports of (3) and (4) above shall include the date, time, duration, general location, approximate number of customers affected, identification of circuit or circuits involved, and, when known, the cause of the interruption. When extensive interruptions occur, as from a storm, a narrative report including the extent of the interruptions and system damage, estimated number of customers affected, and a list of entire communities interrupted may be submitted in lieu of reports of individual interruptions.

History: 1-2-66; am. (1) and cr. (3) to (5), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.23 Metering equipment records. (1) A test record shall be made whenever a unit of metering equipment is tested but need not be retained after the equipment is again tested if a complete history record is maintained. This record shall show information to identify the unit and its location; equipment with which the device is associated; the date of test; reason for the test; readings before and after the test; a statement as to whether or not the meter "creeps" and in case of creeping, the rate; a statement of "as found" and "as left" accuracies sufficiently complete to permit checking of the calculations employed; indications showing that all required checks have been made; a statement of repairs made, if any, and identification of the testing standard and the person making the test.

(2) Each utility shall keep a record for each unit of metering equipment showing when the unit was purchased; its cost; utility's identification; associated equipment; essential name-plate data; dates of tests; results of all "as found" and "as left" tests unless separate records are kept of each test for each unit; and locations where installed with dates of installation and removal.

(3) Each utility shall summarize yearly in a combined tabulation all individual meter and overall light and heavy load "as found" tests at the power factors as required by these rules. This summary shall be divided according to length of meter test period, and separately for single-phase, and polyphase meters. The summary shall show the number of "as found" tests within each of the following accuracy classifications: not recording; 94.0% and under; 94.1% to 96.0%; 96.1% to 98.0%; 98.1% to 99.0%; 99.1% to 100.0%; 100.1% to 101.0%; 101.1% to 102.0%; 102.1% to 104.0%; 104.1% to 106.0%; and over 106.0%. The accuracy summary for the calendar year shall be submitted to the commission by April 1 of the following year, except that utilities using the variable interval plan (PSC 113.525) shall submit the accuracy summaries (for the test year ending September 30) by the following January 1. As found, tests of other units of metering equipment shall be summarized in a manner consistent with the method of testing employed by the utility. A record shall be kept of the number of complaint tests made each year. For the

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annual summary for variable interval plan tests, to show the range of test intervals for each group, the reporting utility shall include for each group the dates of the most recent and most distant periodic tests.

History: 1-2-56; am. (3), Register, December, 1957, No. 24, eff. 1-1-58; am. (3), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.24 Preservation of records. The following records shall be preserved and kept available for inspection by the commission for the periods indicated. The list is not to be taken as comprehending all types of utility records.

Description of records	Period to be retained
Maps showing the location and physical characteristics of existing plants	Currently
Engineering records in connection with construction projects if construction of project results wholly or in part.....	Until record is superseded or 6 years after plant is retired
Production records:	
Station and system generation records	Permanently
All other records taken in the plant	6 years
Operating records:	
Load dispatcher data	6 years
Interruption records	6 years
Meter test.....	See PSC 113.23
Meter history records	Life of meter
Annual meter accuracy summary	16 years
Voltmeter records	See PSC 113.29
All other records of operation	6 years
Equipment record:	
Must be placed in mortality study before destroying	Life of equipment
Customers' records:	
Inspection of customers' premises	6 years
Customers' complaint record.....	6 years
Meter reading sheets	* years
Billing record	* years
Customer deposits.....	6 years after refund
Filed rates and rules.....	Permanently

Note: See also "Regulations to Govern the Preservation of Records of Electric, Gas and Water Utilities" adopted by the commission in dockets 2-U-5005 and 2-U-5396, May 4, 1972, for more comprehensive listing of retention periods of specific records.

*Where machine billing is used and meter readings recorded on tabulating cards the register sheets may be considered the "meter reading sheets" and the "billing records." "Meter reading sheets" and "billing records" or the "register sheets" shall be kept 6 years or until they are no longer needed to adjust bills. This means that the records must be kept 6 years or from the date of one meter test to the next whichever is longer.

History: 1-2-56; am. Register, February, 1978, No. 266, eff. 3-1-78.
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PART V

VOLTAGE STANDARDS

PSC 113.25 Standard and maintenance of voltage. Each utility shall adopt standard nominal service voltages for each of the several areas into which the distribution system or systems may be divided, and shall file with the commission a statement of the standard voltages adopted. The voltage maintained at the point of attachment of customer-owned service to the company-owned conductors, shall be reasonably constant within the following limits:

(1) For all retail service, except power service, rendered in urban communities in which the utility serves 100 or more separate customers, the variation of voltage shall be no more than 5% above or below the standard voltage at any time.

(2) For all retail service except power service rendered in rural areas or in urban communities in which the utility serves less than 100 customers, the variation of voltages shall be no more than 6% above or below the standard voltage at any time.

(3) For retail power service furnished customers having demands of 500 kilowatts or less the voltage variation shall not exceed 5% above nor 10% below the standard voltage; and for retail power service furnished customers having demands of more than 500 kilowatts the voltage variation shall not exceed 10% above nor 10% below the standard voltage. The term "retail power service" as used herein means service furnished principally for electromotive or industrial purposes and may include service for lighting incidental thereto, as defined in the utility's rates and rules.

(4) For retail combined lighting and power service, the voltage variation shall not exceed the limits provided under sections (1) and (2) herein. For rates applicable to combined lighting and power service each utility shall file rules and regulations setting forth the utilization equipment permitted under the rates.

(5) For service rendered to public utilities and others for resale the reference voltage level shall be as mutually agreed upon by the parties concerned and the variations in voltage shall, except with respect to interchange contracts, be no more than 10% above or below the reference voltage level.

(6) The variation of voltage referred to in (1) to (5), inclusive, shall be a gradual change in voltage as a result of normal changes in load and incremental adjustments in voltage level.

History: 1-2-56; r. and recr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.26 Unusual variations of voltage. (1) Variations of voltage, in excess of those specified in section PSC 113.25, caused by service interruptions, the action of the elements, temporary separation of parts of the system from the main system, infrequent and unavoidable fluctuations of short duration, or other causes beyond the control of the utility shall not be considered a violation of these rules.

(2) Where the utility's distribution facilities supplying such customers are reasonably adequate and of sufficient capacity to carry the actual

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loads normally imposed, the utility may require that equipment on customers' premises shall be such that starting and operating characteristics will not cause an instantaneous voltage drop of more than 4% of the standard voltage or cause objectionable flicker to other customers' service.

(3) Service shall be considered inadequate when there are frequent or continuous sudden changes in voltage exceeding 2% where the rate of change exceeds 3 volts per second.

(4) When procedures for voltage reduction during emergency operating conditions have been filed and accepted or approved by the commission, variations of voltage in excess of those specified in PSC 113.25, resulting from implementation of the specified procedures, shall not be considered a violation of the rules.

History: 1-2-56; renum. from 113.28 and am. and cr. (4), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.27 Harmonics of 60 Hz voltage wave. (1) Utilities shall make all reasonable efforts to minimize the effects of higher harmonics. When the source of objectionable harmonics is determined to be equipment owned by a specific customer, the customer shall be so advised and informed of his responsibility to correct the problem. (See PSC 113.015.)

History: 1-2-56; r. and recr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.28 Standard and maintenance of constant current circuits. (1) Equipment supplying constant current circuits shall be so adjusted as to furnish as nearly as practicable the rated current of the circuit supplied, and in no case shall the current vary more than 4% above or below the rating of the circuit.

(2) At least once in each year the current output of the equipment supplying constant current circuits shall be checked and the equipment adjusted if necessary.

History: 1-2-56; renum. from 113.26, Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.29 Voltmeters and voltage records. (1) Each utility shall provide itself with one or more portable indicating voltmeters, and each utility serving more than 150 customers shall also have one or more recording (curve-drawing) voltmeters. Each utility shall make a sufficient number of voltage measurements to indicate the character of the service furnished to its customers and to satisfy the commission upon request of its compliance with the voltage requirements. All voltmeter records, unless replaced by more recent records, shall be available for inspection by the commission for a period of 6 years.

(2) Each recording voltmeter shall be checked with an indicating voltmeter when it is placed in operation and when it is removed, or periodically if the instrument is in a permanent location. Notations on each chart shall indicate when the registration began (time and date) and when the chart was removed, as well as indicate the point where the voltage was taken, and the results of check with indicating voltmeter.

History: 1-2-56; am. Register, February, 1978, No. 266, eff. 3-1-78.

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PART VI

GENERAL METERING REQUIREMENTS

PSC 113.30 Measuring energy on system. Where practical to do so, all electrical quantities required to be reported to the commission shall be metered. Quantities may be calculated when permitted by section PSC 113.31.

PSC 113.31 Measuring customer service. All energy sold to customers shall be measured by commercially acceptable measuring devices owned and maintained by the utility, except where it is impracticable to meter loads, such as certain highway or area lighting, which may be billed at a flat rate based on lamp size and calculated consumption, or temporary or special installations in which case the consumptions may be calculated.

All other electrical quantities which the rates or utility's rules indicate are to be metered shall be metered by commercially acceptable instruments owned and maintained by the utility.

History: 1-2-56; am. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.32 One-point metering. Every reasonable effort shall be made to measure at one point all the electrical quantities necessary for billing a customer under a given rate.

History: 1-2-56; am. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.33 Metering at point of interchange and for customers' operating generating equipment. (1) Metering facilities located at any point where energy may flow in either direction and where the quantities measured are used for billing purposes shall consist of meters equipped with ratchets or other device to prevent reverse registration and be so connected as to meter separately energy flow in each direction.

(2) Reactive metering shall not be employed for determining average power factor where energy may flow in either direction or where customer may generate an appreciable amount of his requirements at any time unless suitable directional relays and ratchets are installed to obtain correct registration under all conditions of operation and unless the general plan of installation is approved by the commission.

PSC 113.34 Type of instruments. All electric service of the same type rendered under the same rate schedule shall be metered with instruments having like characteristics, except that the commission may approve the use of instruments of different types if their use does not result in unreasonable discrimination. Either all of the reactive meters which may run backwards or none of the reactive meters used for measuring reactive power under one schedule shall be ratcheted.

PSC 113.35 Multipliers and test constants. (1) Meters which are not direct reading shall have the multiplier plainly marked on the dial of the instrument or otherwise suitably marked and all charts taken from recording meters shall be marked with the date of the record, the meter number, customer, and chart multiplier.

(2) The register ratio shall be marked on all meter registers.

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(3) The watthour constant for the meter itself shall be placed on *each* watthour meter.

History: 1-2-56; am. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.36 Meter compensation. (1) Metering equipment shall not be set "fast" or "slow" to compensate for supply transformer or line losses.

(2) Loss compensators designed to be used with meters and which accurately add iron and/or copper losses may be used. The compensator shall carry a tag identifying the compensation and shall be tested when the associated meter is tested and when the associated supply equipment or lines are changed.

History: 1-2-56; renum. to be (1) and cr. (2), Register, October, 1965, No. 118, eff. 11-1-65.

PSC 113.37 Sealing meters and service entrance equipment. (1) Meters and metering equipment enclosures which if open would permit access to live parts from which energy could be used without proper measurement, and utility-owned devices and equipment located on a customer's property for the control of his load shall be sealed.

(2) Where the entrance switch is combined with meter-test facilities, or is installed on the supply side of the meter, the entrance switch boxes may be sealed by the utility. The customer may remove the seal from any fuse compartment to replace fuses if the utility is promptly notified that such seal has been broken.

(3) Where a utility supplies different classes of service at different rates to the same premises, such as lighting service and electric water heating service, the utility may seal the service switches.

(4) Sealing and resealing shall be without charge to the customer.

(5) This rule shall not require modernization of old installations or the sealing of installations which cannot practicably be sealed. Sealing shall not be such as to interfere with the operation of any switch or protective equipment.

History: 1-2-56; am. (1), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.38 Installation of metering equipment. (1) The customer or his agent should confer with the utility as one of the first steps in planning an electrical installation. The watthour meter should be located where it will be readily accessible for reading, testing and repairs and where it will not be subjected to adverse operating conditions or cause inconveniences to the customer. Normally, the utility shall determine the location and type of metering equipment to be installed.

(2) The utility should have available for distribution to customers, architects, contractors and electricians copies of rules, specifications and requirements that may be in force relative to meter installations. Installations should conform to such specifications and to applicable codes and safety requirements.

(3) Whether installed indoors or outdoors, meters should not be located where they will be subject to vibration or mechanical damage and should be mounted without tilt.

(4) Meters and associated equipment used on outdoor installations shall be designed specifically for such use or shall be suitably housed for

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outdoor service. Meters installed outdoors should not be located where they may be damaged, such as on buildings where unguarded meters will extend into alleys, walkways or driveways.

(5) Meters installed outdoors should not be more than 6 feet or less than 4 feet above final ground level (measured from the center of the meter cover) except in the case of meters on pedestals or padmounted transformers where they shall be placed as high as practicable, and meters on underground services which may, when practicable, be placed as low as 2½ feet above final ground level (measured from the center of the meter cover). On individual installations indoors the meter should be not more than 6 feet or less than 4 feet above floor level (measured from the center of the meter cover). On group installations of meters indoors no meter should be more than 6 feet or less than 2 feet above floor level (measured from the meter cover). When a number of meters are placed on the same meter panel the distance between centers should be not less than 8½ inches vertically or 7½ inches horizontally. For meters installed both indoors and outdoors there should be a minimum of 3 feet of unobstructed space in front of the meter from the surface on which it is mounted.

(6) When there is more than one meter at a location, each shall be so tagged or marked as to indicate the circuit metered. Where similar types of meters record different quantities (for example, kilowatt-hours and reactive power) the meters shall be tagged to indicate what they are recording.

(7) Test facilities shall be placed in enclosures of sufficient size and of such construction as to make it possible for meter testers to perform the tests required by these rules with safety.

History: 1-2-56; am. (1) (c), Register, October, 1965, No. 118, eff. 11-1-65; r. and recr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.39 Rental charge for metering equipment. The utility may charge a rental for equipment installed to furnish additional metering information to a customer for his use or because of governmental requirements.

PART VII

ACCURACY OF METERS AND AUXILIARY DEVICES

PSC 113.40 Accuracy of watthour meters. (1) Watthour meters used for measuring electrical quantities supplied to customers shall:

(a) Be of proper design for the circuit on which they are used, be properly connected and installed, be in good mechanical condition, have adequate insulation, correct internal connections, and correct register.

(b) Not creep at "no load" a full revolution of the disk in 10 minutes or less when the load wires are disconnected and potential is impressed or in a test in the shop where the load wires are disconnected and the permissible voltage variation impressed. If the rate of creep can be determined in a shorter interval, it is not necessary to wait the full 10-minute period.

(c) If they are designed for use on alternating current circuits, be accurate to within plus or minus 1.0% at 2 unity power factor loads, one equal to approximately 10% and the other approximately 100% (plus or minus 10%) of the reference test current; and shall register correctly

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within 2.0% plus or minus at a power factor of approximately 50% lagging and at a load between 75% and 100% of the reference test current of the meter. For self-contained meters the reference test current shall be the ampere or test ampere rating of the meter, whichever is shown on the nameplate. For meters used with current transformers the reference test current shall be the test-ampere rating of the meter or the secondary rating of the current transformers.

(2) Polyphase meters shall have their stators in balance within 2% at 100% load at unity and at approximately 50% lagging power factor.

(3) Meters used with instrument transformers shall be adjusted, if necessary, so that the overall accuracy of the metering installation will meet the requirements of this rule.

(4) Prepayment meters shall be maintained at the same accuracy and read at the same periods as regular meters.

History: 1-2-56; am. (1) (a), (b), (c), (d) and (2), Register, October 1965, No. 118, eff. 11-1-65; am. (1) (c) and (3), r. (1) (d), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.41 Accuracy of demand meters. (1) A demand meter, demand register, or demand attachment used to measure customer's service shall:

(a) Be in good mechanical and electrical condition.

(b) Have proper constants, indicating scale, contact device, and resetting device.

(c) Not register at no load.

(d) Be accurate to the following degrees:

1. Curve drawing meters which record quantity time curves, and integrated-demand meters shall be accurate to within plus or minus 2.0% of full scale throughout their working range. Timing elements measuring specific demand intervals shall be accurate to within plus or minus 2.0% and the timing elements which serve to provide a record of the time of day when the demand occurs shall be accurate to within plus or minus 4 minutes in 24 hours.

2. Lagged-demand meters shall be accurate to within plus or minus 4% of full scale at final indication.

(2) The overall accuracy of demand metering installations utilizing pulse-initiator and pulse-recorder equipment shall be acceptable when the monthly kilowatt-hours calculated from the pulse count do not differ from the corresponding kilowatt-hour meter registrations by more than the kilowatt-hour constant of the meter, or 2%, whichever is greater. The timing element error shall not be more than plus or minus 4 minutes per day.

(3) When a timing element also serves to keep a record of the time of day at which the demand occurs, it shall be corrected if it is found to be in error by more than plus or minus 4 minutes per day.

History: 1-2-56; cr. (2) and (3), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.42 Requirements as to instrument transformers. (1) Instrument transformers used in conjunction with metering equipment to measure customers' service shall:

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(a) Be in proper mechanical condition and have electrical insulation satisfactory for the service on which used.

(b) Under usual operating conditions be 0.3% accuracy-class units and otherwise 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%	100%	100%
Current	Current	Current
0.6%	0.3%	1%

(2) (a) Meters used in conjunction with instrument transformers shall be adjusted so that the overall accuracies will come within the limits specified in sections PSC 113.40 and 113.41.

(b) Instrument transformers shall be tested with the meter with which they are associated by making an overall test, or may be checked separately. If the transformers are tested separately, the meters shall also be checked to see that the overall accuracy of the installation is within the prescribed accuracy requirements.

(c) The results of tests of instrument transformers shall be kept on record and available for use when transformers are installed. For other than 0.3% accuracy class instrument transformers, the results of the most recent test for each instrument transformer shall be entered on or attached to the test card form for each test of the associated meter prior to the test of that meter.

(3) Phase shifting transformers shall have secondary voltages under balanced line-voltage conditions within 1% plus or minus of the voltage impressed on the primary.

History: 1-2-58; r. and rec. (1) (b) and am. (2) (c), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.43 Portable indicating instruments. All portable indicating electrical instruments used for determining quality of service to customers or for billing purposes, such as voltmeters, ammeters, and watt meters, shall be checked against suitable secondary reference standards at least once in each 6 months. If the portable indicating instrument is found appreciably in error at zero or in error by more than 1% of indication at commonly used scale deflections, it shall be adjusted. A history and calibration record shall be kept for each such instrument.

PSC 113.435 Determination of average meter error. Whenever a metering installation is found upon any test to be in error by more than 2% at any test load, the average error shall be determined in one of the following ways:

(1) If the metering installation is used to measure a load which has practically constant characteristics, such as a street-lighting load, the meter shall be tested under similar conditions of load and the accuracy of the meter "as found" shall be considered as the average accuracy.

(2) If a single-phase metering installation is used on a varying load, the average error shall be the weighted algebraic average of the error at light load and the error at heavy load, the latter being given a weighting of 4 times the former.

(3) If a polyphase metering installation is used on a varying load, the average error shall be the weighted algebraic average of its error at light load given a weighting of 1, its error at heavy load and 100% power factor given a weighting of 4, and at heavy load and 50% lagging power factor given a weighting of 2.

(4) If a load, other than the light, heavy, and low power-factor load specified for routine testing, is more representative of the customary use of the metering equipment, its error at that load should also be determined. In this case the average error is to be computed by giving the error at such load and power factor a weighting of 3 and each of the errors at the other loads (light, heavy, and 50% lagging power factor) a weighting of 1. Each error shall be assigned its proper sign.

History: 1-2-56; renum. from 113.48 and am. (2), Register, February, 1978, No. 266, eff. 3-1-78.

PART VIII

TESTING EQUIPMENT, STANDARDS AND TEST METHODS

PSC 113.44 Testing equipment. (1) Each utility shall maintain sufficient laboratories, meter testing shops, secondary standards, instruments, and facilities to determine the accuracy of all types of meters and measuring devices used by the utility. A utility may, however, have all or part of the required tests made or its portable testing equipment checked by the commission's electric standards laboratory at the university of Wisconsin or with the approval of the commission by another utility or agency having adequate and sufficient testing equipment to comply with these rules.

(2) Each utility shall have the following minimum testing equipment available:

(a) One or more portable standard watthour meters of capacity and voltage range adequate to test all watthour meters used by the utility.

(b) Portable indicating instruments of such various types as are required to determine the accuracy of all instruments used by the utility.

(c) One or more secondary standards to check each of the various types of portable standard watthour meters used for testing watthour meters. Each secondary standard shall consist of either an approved portable standard watthour meter kept permanently at one point and not used for field work, or not less than three approved watthour meters connected with current coils in series and voltage coils in parallel and kept running by connecting a 10-watt load. These meters must be well compensated for both classes of temperature errors, practically free from errors due to ordinary voltage variations, and free from erratic registration due to any cause.

(d) Suitable standards which are not used for field work to check portable instruments used in testing.

(3) Any utility having more than 10,000 customers, or any other utility upon approval of the commission, may provide and use primary standards consisting of precision instruments, timing devices, potentiometers, standard cells, etc.

History: 1-2-56; am. (2) (a) and (c), Register, February, 1978, No. 266, eff. 3-1-78. Register, February, 1978, No. 266

PSC 113.45 Accuracy and calibration of test standards. (1) (a) Utilities maintaining primary standards such as precision wattmeters, volt boxes, resistances, standard cells, and timing devices shall have such standards certified at the time of purchase as to accuracy by a recognized laboratory other than that of the manufacturer of the standard.

(b) Utilities having standard cells shall intercompare them regularly and shall have at least one of them checked by a standardizing laboratory at intervals of not more than 2 years. Reference standards of resistance, potentiometers, and volt boxes shall be checked at intervals of not more than 3 years.

(2) (a) Secondary watt-hour-meter standards shall not be in error by more than plus or minus 0.3% at loads and voltages at which they are to be used, and shall not be used to check or calibrate working standards unless the secondary standard has been checked and adjusted, if necessary, to such accuracy within the preceding 12 months. Each secondary standard watt-hour meter shall have a calibration curve available and a history card.

(b) Any 2 or more of at least 3 watt-hour meters may be used as a secondary standard to check portable rotating standards provided there is no discrepancy in accuracy between any two of the watt-hour meters used of more than 0.2% at standard test loads. Calibration and history records shall be maintained for each of the meters used as secondary standards.

(3) Secondary standards indicating instruments shall not be in error by more than plus or minus 0.5% of indication at commonly used scale deflection and shall not be used to check or calibrate portable indicating instruments unless the secondary standard has been checked, and adjusted, if necessary, within the preceding 12 months. A calibration record shall be maintained for each standard.

(4) (a) All working portable standard watt-hour meters when regularly used shall be compared with a secondary standard at least once in every 2 weeks, and if infrequently used shall be compared with a secondary standard before they are used.

(b) Working portable standard watt-hour meters shall be calibrated annually (see Wis. Adm. Code section PSC 113.46 (1) and (2)) and shall be adjusted, if necessary, so that their accuracy will be within 99.7% and 100.3% at 100% power factor and within 99.5% and 100.5% at 50% lagging power factor at all voltages and loads at which the standard may be used. A history and calibration record shall be kept for each working portable standard watt-hour meter.

(5) The meter accuracies herein required as to all primary, secondary, and portable standards and service measuring equipment shall be referred to 100%.

History: 1-2-56; am. (4) (b) and (5), Register, October, 1965, No. 118, eff. 11-1-65; am. (4), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.46 Check of standards by commission. (1) Each utility shall submit to the Electrical Standards Laboratory at the university of Wisconsin once each year, one of each type of portable standard watt-hour meter (60 hertz or 25 hertz) and once each 2 years one of each type of portable indicating voltmeter, ammeter, wattmeter, and other test instruments.

(2) Each utility which normally checks its own working portable standard watt-hour meters or instruments against primary or secondary standards shall calibrate these standards or instruments before they are submitted and attach to them a record of such calibration. In lieu of such calibrations the commission may require an alternative procedure for intercomparing the primary or secondary standards of the utility with standards maintained by the Electrical Standards Laboratory at the University of Wisconsin.

(Note: Previously sec. 113.49, with changes)

History: r. 113.46, 113.465 and 113.49 and recr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.471 Methods of testing watt-hour meters. (1) In all tests of watt-hour meters where comparison of revolutions is made, at least 2 revolutions of the meter under test shall be taken at light load and at least 9 revolutions at heavy load. At least 2 checks shall be made at each load. The accuracy of the meter under test at each load shall be the average accuracy determined from 2 checks taken at the same load which must agree within 0.2 of 1% unless the meter is erratic. However, if a mechanical testing device is used, the test procedure may be modified provided equal accuracy of method is maintained.

(2) If the watt-hour meter has a contact device which operates a demand mechanism, the disk revolutions when testing should be multiples of the number of revolutions per contact in order to take account of the varying friction which may be present during the movement of the contact cam from one contact to the next.

(3) Polyphase meters shall be tested by one of the following 4 methods:

(a) Single-phase test with the potential circuits connected in parallel and all current circuits connected in series. Three-stator, 4-wire delta meters must have correct values of current and potential applied to the differently rated circuits. The normal test loads apply. (See section PSC 113.40 (1) (c).)

(b) Individual stator test with the potential circuits connected in parallel and each current circuit tested separately. (For 2-stator, 4-wire delta meters, the current circuits of the 3-wire stator should be connected in series and treated as a single circuit. Three-stator, 4-wire delta meters must have correct values of potential applied to the differently rated circuits.) The light load test current shall be one-tenth N times the reference test current and the heavy load test current shall be between one-half and one N times the reference test current but not more than twice the test ampere rating of the meter. (N equals the number of stators in the meter except for 2-stator, 3-phase, 4-wire wye meters. For the latter, N shall be 4 for the current circuits which are not common to both stators and N shall be 2 for the current circuit common to both stators.)

(c) Individual stator test with the potential circuits connected to the polyphase circuit in the same manner as in service. (For 2-stator, 4-wire delta meters the current circuits of the 3-wire stator shall be connected in series and treated as a single circuit.) The light load test current shall be one-tenth N times the reference test current and the heavy load test current shall be between one-half and one N times the reference test current but not more than twice the test ampere rating of the meter. (N

equals the number of stators in the meter except for 2-stator, 3-phase, 4-wire meters. For the latter N shall be 3 for each current circuit.)

(d) Polyphase test with the meter connected to a polyphase circuit in the same manner as in service, with balanced polyphase currents on the current circuits. This requires the use of a polyphase standard watt-hour meter or as many single-phase standards as there are current circuits under test.

(4) Instrument transformers shall be tested with a burden equivalent to that with which they are to be used or with burdens from which curves showing the accuracy of the transformer can be derived. Any approved method may be used for testing instrument transformers.

History: L-2-56; r. and recr. (3), Register, October, 1965, No. 118, eff. 11-1-65; renun. from 113.47 and am. (3) (a), Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.472 Methods of testing block-interval demand registers.

(1) The actual demand interval shall be determined and a billing period reset performed to determine that the pointer or test dial pointer returns to zero.

(2) For required field tests the demand register shall be tested as mounted on the watthour meter. The test interval shall include one demand interval or less, however, the demand registered shall be at least 30% of full scale. The demand registered shall be compared with the corresponding demand determined from either the disc revolutions of the associated watthour meter or, where feasible, with the registration of the portable standard watthour meter properly corrected for this test.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.473 Methods of testing block-interval pulse-operated demand meters and pulse recorders. (1) The test shall include a check of the electrical and mechanical operation of the demand register or pulse recorder, an inspection of the pulse initiator and a check to determine that the demand meter resets properly.

(2) A demand meter or pulse recorder, its associated pulse initiators, relays and circuitry may be considered to be operating properly when a kilowatthour check indicates that the demand meter kilowatthours are within the required accuracy limits of the watthour meter kilowatthours. At least 20 pulses shall be transmitted from each pulse initiator during the test and it shall be determined that every pulse is received (recorded). The kilowatthour value of a pulse from each pulse initiator should be verified. In the case of pulse recorders, the incoming pulses may be checked against the counters on the pulse recorders, where available, or against visual or audible test equipment. When warranted, a test tape may be installed and the reading from the tape compared with the number of incoming pulses.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PART IX

TESTING OF METERING EQUIPMENT

PSC 113.50 Testing of metering installations-general requirements. (1) The test of any unit of metering equipment shall consist of a comparison of its accuracy with a standard of known accuracy by a qualified person. Units not properly connected or not meeting the accuracy or other requirements of PSC 113.40, 113.41, and 113.42 at the time of

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test shall be reconnected and/or rebuilt to meet such requirements and adjusted to within the required accuracy and as close to 100% accurate as practicable or their use discontinued.

(2) Each unit of metering equipment shall be inspected for mechanical and electrical faults whenever the accuracy of the device is checked.

(3) Each meter tested shall have the register and the internal connections checked before the meter is first placed in service and whenever the meter is repaired.

(4) Each meter shall have the connections to the customer's circuits, the disc rotation and any multiplier checked when the meter is installed or removed or an instrument transformer is changed.

(5) Single phase meters shall be verified for accuracy at 50% power factor before first being used for measuring customer's service either by a test of each meter or by a sample test plan approved under PSC 113.51 (1) (a) and each polyphase meter shall be tested at 50% power factor whenever tested.

(6) The connections, phase sequence and multiplier of polyphase transformer-rated metering installations shall be checked for error by qualified personnel within 60 days after the meter is installed.

(7) Special control devices, switches, etc., for time-of-use service shall be checked for proper operation whenever the associated meter is tested.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.51 Testing of self-contained single-phase meters and 3-wire network meters. (1) These meters together with associated equipment such as demand devices, control devices, etc. shall be tested for accuracy at unity power factor at the point where they are installed or at a central testing point or in a mobile testing laboratory:

(a) Within a period of 12 months before to 60 days after they are placed in service. (Exception: For new meters given a prior test by the manufacturer, a sample test program approved by the commission may be substituted for this requirement.)

(b) When they are suspected of being inaccurate or damaged.

(c) When the accuracy is questioned by a customer. (See PSC 113.57)

(d) Before use when they have been inactive for more than one year.

(e) When they are removed from service.

(f) Within a period of 6 months before to 6 months after 8 years of service for non-surge-proof and 12 years for surge-proof meters or in accordance with the plan outlined in Wis. Adm. Code section PSC 113.515. (Exception: Lagged-demand meters shall be tested every 8 years.)

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.515 Variable interval testing plan for self-contained meters. (1) The variable interval plan described below may be used for testing self-contained, single-phase and 3-wire network meters without demand registers or pulsing devices instead of the periodic test periods in section PSC 113.51, if the utility is authorized to do so by the commission.

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(a) The meters shall be divided into homogeneous groups as approved by the commission, such as by manufacturers' types, and may be further subdivided in accordance with location or other factors which may be disclosed by test records to have an effect on the percentage registration of the meter.

(b) The meter accuracy for each of the groups shall be based on the results of tests of meters longest in service without test made during a 12-month period. The meter accuracy shall be the weighted average of the full and light load test with the full test being given a weighting of 4 and the light load test a weighting of 1.

(c) Each group of meters is to be considered separately in determining the number of meters to be tested in any period. The percentage, P, of meters in each group to be tested annually shall be based on the number of meters which were found during the previous year's in service tests to have a percentage registration of more than 102% or less than 98%.

The maximum value of P shall be 25% and the minimum value shall be not less than:

5% for a group of 2,000 or more meters. (Exception: The interval between tests shall not exceed 16 years, 6 months.)

100 meters or 10%, whichever is less, for a group of fewer than 2,000 meters.

The values of P between the maximum and minimum shall be determined from the formula:

$$P=6.25 \left[\left[\frac{100 (F+S)}{T} \right] - 1 \right]$$

Where T=total number of meters tested in the group during the preceding year.

F=number of meters in this group which registered more than 102%.

S=number of meters in this group which registered less than 98%.

(d) Meter tests scheduled for the current year in each group shall consist of meters longest in service without test.

(e) Only scheduled periodic and scheduled retirement tests are to be considered when applying the formula.

(Note: Previously sec. 113.465, with changes.)

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.52 Testing of self-contained polyphase meters. (1) These meters together with associated equipment such as demand equipment, control devices, etc., shall be tested on the customer's premises (except (a), (d) and (e) below) for accuracy at unity and 50% power factor: (Exception: Lagged-demand meters and socket-type self-contained polyphase meters may be tested at a central testing point or in a mobile testing laboratory.)

(a) Before being placed in service.

- (b) When they are suspected of being inaccurate or damaged.
- (c) When the accuracy is questioned by a customer. (See PSC 113.57)
- (d) Before use when they have been inactive for more than 1 year.
- (e) Within 60 days after they are removed from service.
- (f) Within a period of 6 months before or 6 months after 8 years of service for non-surge-proof and 12 years for surge-proof meters. (Exception: Thermal and mechanical lagged-demand meters shall be tested every 8 years.)

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.53 Testing of meters used with instrument transformers on single-phase service. (1) These meters together with associated equipment such as demand equipment, control devices, etc., shall be tested on the customer's premises (except (a), (d) and (e) below) for accuracy at unity power factor: (Exception: Lagged-demand meters may be tested at a central testing point or in a mobile testing laboratory.)

- (a) Before being placed in service.
- (b) When they are suspected of being inaccurate or damaged.
- (c) When the accuracy is questioned by a customer. (See PSC 113.57.)
- (d) Before use when they have been inactive for more than 1 year.
- (e) When they are removed from service.
- (f) Within a period of 6 months before or 6 months after 8 years of service for non-surge-proof and 12 years for surge-proof meters. (Exception: Lagged-demand meters shall be tested every 8 years.)

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.54 Testing of polyphase meters used with instrument transformers. (1) These meters together with associated equipment such as demand equipment, pulsing devices, phase-shifting transformers, control devices, etc., shall be tested on the customer's premises (except for (a), (d) and (e) below) for accuracy at unity and 50% power factor: (Exception: Lagged-demand meters may be tested at a central testing point or in a mobile testing laboratory.)

- (a) Before being placed in service.
- (b) When they are suspected of being inaccurate or damaged.
- (c) When the accuracy is questioned by a customer. (See PSC 113.57.)
- (d) Before use when they have been inactive for more than 1 year.
- (e) When they are removed from service.
- (f) Within a period of 2 months before or 2 months after 2 years of service for both non-surge-proof and surge-proof meters.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.
Register, February, 1978, No. 266

PSC 113.55 Testing of metering installations utilizing pulse devices. (1) Metering installations utilizing pulse initiators and pulse recorders shall be checked for accuracy each billing period by comparing the recorded pulse count against the registration of the corresponding meter. When the results are not in agreement within the accuracy limits of PSC 113.41 (2) the pulse devices shall be promptly tested and adjusted to required accuracy or replaced.

(2) Pulse devices shall be tested before use and as part of the complete metering installation whenever the associated watthour meter is tested.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.555 Testing of metering installations for time-of-use rates. (1) Specialized metering installations for service furnished under time-of-use rates shall be tested according to procedures as filed with and accepted by the commission.

(2) Each utility shall file its suggested test interval (s) and procedures for each type of specialized metering installation within 12 months after being placed in normal service. This does not apply to test or trial installations used for revenue metering for which the test or trial period does not exceed 24 months.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.56 Testing of instrument transformers. (1) No instrument transformer shall be placed in service, or allowed to remain in service, if it shows evidence of physical damage, discolored terminals due to overload, change in texture or resiliency of insulation, or arc tracking on the insulation or bushings.

(2) Voltage-withstand tests. Instrument transformers of all utilities shall be tested for voltage withstand by the manufacturer, the utility, or a laboratory approved for such test by the commission before being placed in service. (The University of Wisconsin Electrical Standards Laboratory is not equipped to perform these voltage-withstand tests.) In addition, each instrument transformer that has been removed from service shall be tested for voltage withstand prior to reinstallation if the reason for removal or physical appearance, gives cause to doubt its reliability. The utility shall maintain a record of all such tests.

(3) Instrument transformers of class A utilities shall be tested at the utility meter shop or the University of Wisconsin Electrical Standards Laboratory for accuracy (ratio correction factor and phase angle):

(a) Before being initially placed in service.

(b) When removed from service.

(c) When there is evidence from outward appearance or performance to suspect inaccuracy.

(4) Instrument transformers of other than class A utilities shall be tested for accuracy (ratio correction factor and phase angle):

(a) Before being placed in service. This test may be performed by the manufacturer, the utility, or the University of Wisconsin Electrical Standards Laboratory.

(b) When there is evidence from outward appearance or performance to suspect inaccuracy. This test may be performed by the University of Wisconsin Electrical Standards Laboratory.

(5) Instrument transformers in service shall be given an approved check (such as the variable burden method in the case of current transformers or a field check of the secondary voltage with a good quality voltmeter in the case of voltage transformers) made in conjunction with each field test of the associated watthour meter. When such check provides evidence that the instrument transformer may be inaccurate, that instrument transformer shall be tested for accuracy.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.57 Customer request test. Each utility shall promptly make a test of any metering installation upon request of the customer if 12 months or more have elapsed since the last request test of the meter in the same location. The test shall consist of a test for accuracy and a check of the register and meter connections on the customer's premises. At the customer's request and expense the installation shall be checked for accidental grounds. The customer shall be furnished a report of the result of the test. (See PSC 113.17 for adjustment of bills for inaccurate meters.)

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.575 Commission referee test. (1) Upon application and payment of the following fee to the commission by any customer, the commission will make a test covering the accuracy of the installation, check of connections, and any other check or test which appears desirable. The utility shall reimburse the customer for the fee if the watthour or varhour meter creeps or if the error in registration is more than 2% fast (average error as defined in section PSC 113.435), if the demand meter tested is more than 1.5% fast in excess of the tolerance allowed in section PSC 113.41, or if improper connections or auxiliary equipment results in over-registration greater than stated above. The fees for making such tests shall be as follows:

Single-phase self-contained watthour meter*	\$ 5
Single-phase transformer-rated watthour meter*	\$10
Polyphase self-contained watthour meter*	\$20
Polyphase transformer-rated watthour or varhour meter*	\$50
Demand register	\$10
Instrument transformer field check, for each transformer checked	\$ 5
Other metering equipment	**

*Exclusive of any demand register

**At cost of test

(2) In the case of a test involving a metering installation for residential or farm time-of-use service, the test fee for metering equipment other than instrument transformers may be waived by the Commission for requests made within 5 years from the effective date of this revised rule.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PART X

AUXILIARY METERING DEVICES

PSC 113.60 Phase-shifting transformers. (1) For phase-shifting transformers in service, all terminal connections shall be in such condition as to provide good electrical contact and the terminal designations shall be clearly visible. Where there is evidence of physical damage or evidence of thermal overload the unit shall be replaced.

(2) Phase-shifting transformers shall be tested on the same schedule and at the same time as the meters with which they are associated. The test shall consist of a single-phase test to be performed as follows: With the approximate rated voltage applied to the input terminals and no burdens connected to the tap terminals all tap voltages, converted to percentage of input voltage, shall agree within plus or minus 2.0% of the theoretical values given in the manufacturer's published data.

(3) In addition, all units shall be tested before use and when returned to the utility's meter laboratory. For these tests the output-voltage values in terms of percentage of input voltage and under the conditions of (2) immediately above shall agree within plus or minus 1.0%.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.

PSC 113.61 Transformer-loss compensators. (1) For transformer-loss compensators in service all terminal connections shall be in such condition as to provide good electrical contact and the terminal designations shall be clearly visible. Where there is evidence of physical damage to the component parts, their adjustments, or to the internal wiring or evidence of thermal overload on the insulation, resistors, terminals, etc., the affected parts shall be replaced or the entire transformer-loss compensator replaced.

(2) Transformer-loss compensators shall be tested on the same schedule and at the same time as the meters with which they are associated.

(3) The tests shall be made at the normal service test points of the meter. Performance deviations from desired performance shall not exceed plus or minus 0.3%.

History: Cr. Register, February, 1978, No. 266, eff. 3-1-78.