DEPARTMENT OF LABOR AND ECONOMIC GROWTH

PUBLIC SERVICE COMMISSION

TECHNICAL STANDARDS FOR ELECTRIC SERVICE

(By authority conferred on the public service commission by section 7 of 1909 PA 106, section 5 of 1919 PA 419, and sections 4 and 6 of 1939 PA 3, MCL 460.557, 460.55, 460.4, and 460.6.)

PART 1. GENERAL PROVISIONS

R 460.3101 Applicability; purpose; modification; adoption of rules and regulations by utility.

Rule 101. (1) These rules apply to electric utilities that operate within the state of Michigan under the jurisdiction of the public service commission.

(2) These rules are intended to promote safe and adequate service to the public and to provide standards for uniform and reasonable practices by utilities.

(3) These rules do not relieve a utility from any of its duties under the laws of this state.

(4) Each utility may adopt reasonable rules and regulations governing its relations with customers which it finds necessary and which are not inconsistent with these rules for electric service. Adopted rules and regulations shall be filed with, and approved by, the commission.

History: 1983 AACS; 1996 AACS.

R 460.3102 Definitions.

Rule 102. As used in these rules:

(a) "Acceptable to the commission" means that a commission order has been obtained.

(b) "Approved by the commission" means that a commission order has been obtained.

(c) "Commission" means the Michigan public service commission.

(d) "Customer," except as used in R 460.3411, means any person, firm, association, or corporation, or any agency of the federal, state, county, or municipal government that purchases electric service supplied by a utility.

(e) "Electric plant" means all real estate, fixtures, or property that is owned, controlled, operated, or managed in connection with, or to facilitate the production, transmission, and delivery of, electric energy.

(f) "File" means to deliver to the commission's executive secretary.

(g) "Meter," unless otherwise qualified, means a device that measures and registers the integral of an electrical quantity with respect to time.

(h) "Metering error" means a failure to accurately measure and record all of the electrical quantities that are required by the applicable rate or rates.

(i) "Meter shop" means a shop where meters are inspected, repaired, and tested. A meter shop may be at a fixed location or may be mobile.

(j) "Premises" means an undivided piece of land that is not separated by public roads, streets, or alleys.

(k) "Submit" means to deliver to the commission's designated representative.

(l) "Utility" means an electric company, whether private, corporate, or cooperative, that operates under the jurisdiction of the commission.

History: 1983 AACS; 1996 AACS; 2008 AACS.

R 460.3103 Rescission.

Rule 103. R 460.501 to R 460.505 of the Michigan Administrative Code, appearing on pages 4695 to 4709 of the 1979 Michigan Administrative Code, are rescinded.

History: 1983 AACS.

PART 2. RECORDS AND REPORTS

R 460.3201 Records; location; examination.

Rule 201. Upon a request by the commission or its designated representative, records which are required by these rules or which are necessary for the administration of these rules shall be available within the state of Michigan for examination by the commission or its designated representative.

History: 1983 AACS; 1996 AACS.

R 460.3202 Records; preservation.

Rule 202. Unless otherwise specified in these rules, or by other order of the commission, all records that are required by these rules shall be preserved for the period of time specified in R 460.2501 et seq. of the Michigan Administrative Code.

History: 1983 AACS.

R 460.3203 Documents and information; required submission.

Rule 203. A utility shall submit all of the following documents and information and shall maintain the documents and information in a current status:

(a) A copy of the utility's tariff.

(b) A copy of the utility's rules and standards that are made available to the public covering meter and service installation.

(c) A copy of each type of customer bill form.

(d) A list of the cities, villages, and townships that the utility serves. Upon a request by the commission or its designated representative, the utility shall also provide copies of the associated franchise information.

(e) The name, title, address, and telephone number of the persons to be contacted in connection with the following matters:

(i) General management duties.

(ii) Customer relations (complaints).

(iii) Engineering operations.

(iv) Meter tests and repairs.

(v) Emergencies during non-office hours.

(f) An annual copy of the utility's construction budget, which shall be updated for all major changes to generating and transmission facilities.

(g) An "Electric Service" monthly report, on forms suitable to the commission, that shows information concerning the utility's acquisition and disposition of electric energy and other information as required. The reports shall be submitted by investor-owned utilities within 50 days after the end of the quarter reported and by rural electric cooperatives within 50 days after the end of the month reported.

(h) A map or maps that show the utility's operating area within this state, including generating stations and transmission lines with their voltage designations. Upon a request by the commission or its designated representative, the utility shall also make available a map or maps that show all of the following:

(i) Distribution lines with the number of phases designated.

(ii) State boundary crossings.

(iii) Service areas.

History: 1983 AACS; 1996 AACS.

R 460.3204 Customer records; retention period; content.

Rule 204. (1) The utility shall retain records as necessary to comply with R 460.3309. The records shall be retained for not less than 3 years.

(2) Records for customers shall show, if applicable, all of the following information:

(a) Kilowatt-hour meter reading.

(b) Kilowatt-hour consumption.

(c) Kilowatt, kilovolt ampere, and kilovar meter reading.

(d) Kilowatt, kilovolt ampere, and kilovar measured demand.

(e) Kilowatt, kilovolt ampere, and kilovar billing demand.

(f) Total amount of bill.

History: 1983 AACS; 1996 AACS; 2008 AACS.

PART 3. METER REQUIREMENTS

R 460.3301 Metered measurement of electricity required; exceptions.

Rule 301. (1) All electricity that is sold by a utility shall be on the basis of meter measurement, except where the consumption can be readily computed or except as provided for in a utility's filed rates.

(2) Where practicable, the consumption of electricity within the utility or by administrative units associated with the utility shall be metered.

(3) Meters shall be in compliance with part 6 of these rules.

History: 1983 AACS; 1996 AACS.

R 460.3302 Rescinded.

History: 1983 AACS; 1996 AACS.

R 460.3303 Meter reading data.

Rule 303. The meter reading data shall include all of the following information:

(a) A suitable designation identifying the customer.

(b) Identifying number or description of the meter, or both.

(c) Meter readings or, if a reading was not taken, an indication that a reading was not taken.

(d) Any applicable multiplier or constant.

History: 1983 AACS; 1996 AACS.

R 460.3304 Meter data collection system.

Rule 304. A meter data collection system that takes data from recording meters shall indicate all of the following:

(a) The date of the record.

(b) The equipment numbers.

(c) A suitable designation identifying the customer.

(d) The appropriate multipliers.

History: 1983 AACS; 1996 AACS.

R 460.3305 Meter multiplier.

Rule 305. If it is necessary to apply a multiplier to the meter registration, then the multiplier shall be displayed on the face of the meter.

History: 1983 AACS; 1996 AACS.

R 460.3306 Rescinded.

History: 1983 AACS; 1996 AACS; 2008 AACS.

R 460.3307 Rescinded.

History: 1983 AACS; 1996 AACS.

R 460.3308 Standards of good practice; adoption by reference.

Rule 308. In the absence of specific rules of the commission, a utility shall apply the provisions of the publications set forth in this rule as standards of accepted good practice. The following standards are available from the American National Standards Institute (ANSI), Customer Service, 25 West 43rd St., 4th floor, New York, New York, 10036, USA, telephone number:1-212-642-4900 or via the internet at web-site: http://webstore.ansi.org/ansidocstore/; at the cost listed below as of the time of adoption of these rules, plus a handling charge (for paper copies):

(a) American National Standards Institute standards for electricity meters ANSI C12.1-2001 and C12.20-2002. Cost $120.00.

(b) American National Standards Institute/American Society for Quality Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming (ANSI/ASQ Z1.9-2003). Cost $100.00.

(c) American National Standards Institute IEEE Standard Requirements for Instrument Transformers (ANSI C57.13-1993). Cost $110.00.

(d) American National Standards Institute IEEE Standard for High Accuracy Instrument Transformers, IEEE Std. C57.13.6-2005. Cost $35.00.

(e) The standards adopted in subdivisions (a) to (d) of this rule are also available for inspection at the Michigan Public Service Commission, 6545 Mercantile Way, P.O. Box 30221, Lansing, Michigan, 48909. Copies of these standards may also be obtained from the MPSC at the cost charged by ANSI, plus $20.00 for shipping and handling.

History: 1996 AACS; 2008 AACS.

R 460.3309 Metering inaccuracies; billing adjustments.

Rule 309. (1) An adjustment of bills for service for the period of inaccuracy shall be made for over registration and may be made for under registration under any of the following conditions:

(a) If a meter creeps.

(b) If a metering installation is found upon any test to have an average inaccuracy of more than 2.0%.

(c) If a demand metering installation is found upon any test to have an average inaccuracy of more than 1.0% in addition to the inaccuracies allowed under R 460.3609.

(d) If a meter registration has been found to be inaccurate due to apparent tampering by a person or persons known or unknown.

(2) The amount of the adjustment of the bills for service shall be calculated on the basis that the metering equipment is 100% accurate with respect to the testing equipment used to make the test. The average accuracy of watt-hour meters shall be calculated in accordance with R 460.3616.

(3) If the date when the inaccuracy in registration began can be determined, then that date shall be the starting point for determining the amount of the adjustment and shall be subject to subrule (12) of this rule.

(4) If the date when the inaccuracy in registration began cannot be determined, then it is assumed that the inaccuracy existed for the period of time immediately preceding discovery of the inaccuracy that is equal to 1/2 of the time since the meter was installed on the present premises, 1/2 of the time since the last test, or 6 years, whichever is the shortest period of time, except as otherwise provided in subrule (5) of this rule and subject to subrule (12) of this rule.

(5) The inaccuracy in registration due to creep shall be calculated by timing the rate of creeping under R 460.3607 and by assuming that the creeping affected the registration of the meter for the period of time immediately preceding discovery of the inaccuracy that is equal to 1/4 of the time since the meter was installed on the present premises, 1/4 of the time since the last test, or 6 years, whichever is the shortest period of time, subject to subrule (12) of this rule.

(6) If the average inaccuracy cannot be determined by test because part, or all, of the metering equipment is inoperative, then the utility may use the registration of check metering installations, if any, or estimate the quantity of energy consumed based on available data. The utility shall advise the customer of the metering equipment failure and of the basis for the estimate of the quantity billed. The same periods of inaccuracy shall be used as explained in this rule.

(7) Recalculation of bills shall be on the basis of the recalculated monthly consumption.

(8) If the recalculated bills indicate that an amount is due an existing customer or that more than $10.00 is due a former customer of the utility, then the utility shall refund the full amount of the difference between the amount paid and the recalculated amount.

(9) Refunds shall be made to the 2 most recent customers who received service through the meter found to be inaccurate. If a former customer of the utility, a notice of the amount of the refund shall be mailed to such customer at the last known address. The utility shall, upon demand made by the customer within 3 months of mailing of the notice, forward the refund to the customer.

(10) If the recalculation of billing as a result of a metering inaccuracy indicates that more than $1.00 is owed to the utility by an existing customer or that more than $10.00 is owed to the utility by a former customer, then the utility may issue a bill for the amount, subject to subrule (12) of this rule.

(11) Each utility may establish a policy setting a minimum amount for which it may bill a customer due to under registration that is more than the amounts in subrule (10) of this rule. The minimum amount established in the utility policy shall be applied in all cases of under registration to determine whether the customer will be billed for the amount due the utility because of under registration.

(12) Except in cases of tampering, back billing of customers for metering inaccuracies is limited to the 2-year period immediately preceding discovery of the inaccuracy. The customer shall be given a reasonable time in which to pay the amount of the back billing, after consideration of the amount of the back bill and the duration of the inaccuracy, and service shall not be shut off during this time for nonpayment of the amount of the back billing if the customer is complying with the repayment agreement.

History: 2008 AACS.

PART 4. CUSTOMER RELATIONS

R 460.3401 Rescinded.

History: 1983 AACS; 1996 AACS; 2008 AACS.

R 460.3402 Rescinded.

History: 1983 AACS; 1996 AACS; 2008 AACS.

R 460.3403 Rescinded.

History: 1983 AACS; 1996 AACS; 2008 AACS.

R 460.3404 Rescinded.

History: 1983 AACS; 1996 AACS; 2008 AACS.

R 460.3405 Rescinded.

History: 1983 AACS; 1996 AACS.

R 460.3406 Rescinded.

History: 1983 AACS; 1996 AACS; 2008 AACS.

R 460.3407 Rescinded.

History: 1983 AACS; 1996 AACS; 2008 AACS.

R 460.3408 Temporary service; cost of installing and removing equipment owned by utility.

Rule 408. If the utility renders temporary service to a customer, it shall require that the customer bear the cost of installing and removing the utility-owned equipment in excess of any salvage realized.

History: 1983 AACS; 1996 AACS.

R 460.3409 Protection of utility-owned equipment on customer's premises.

Rule 409. (1) The customer shall use reasonable diligence to protect utility-owned equipment on the customer's premises and to prevent tampering or interference with the equipment. The utility may shut off service in accordance with applicable rules of the commission if the metering or wiring on the customer's premises has been tampered with or altered in any manner that allows unmetered or improperly metered energy to be used or to cause an unsafe condition.

(2) If a utility shuts off service for unauthorized use of service, then both of the following provisions shall apply:

(a) The utility may bill the customer for the unmetered energy used and any damages that have been caused to utility-owned equipment.

(b) The utility is not required to restore service until the customer does all of the following:

(i) Makes reasonable arrangements for payment of the charges in subdivision (a) of this subrule.

(ii) Agrees to pay the approved reconnection charges.

(iii) Agrees to make provisions and pay charges for relocating utility-owned equipment or making other reasonable changes that may be requested by the utility to provide better protection for its equipment.

(iv) Provides the utility with reasonable assurance of the customer's compliance with the utility's approved standard rules and regulations.

(3) Failure to comply with the terms of an agreement to restore service after service has been shut off pursuant to subrule (1) of this rule shall be cause to shut off service in accordance with the rules of the utility and the commission.

(4) If service is shut off pursuant to subrule (3) of this rule and the utility must incur extraordinary expenses to prevent the unauthorized restoration of service, the utility may bill the customer for the expenses, in addition to all other charges that may apply under this rule, and may require that the expenses and other charges be paid before restoring service. A reasonable effort shall be made to notify the customer at the time of shutoff that additional charges may apply if an attempt is made to restore service that has been shut off.

(5) The customer of record who benefits from the unauthorized use shall be responsible for payment to the utility for the energy consumed.

(6) The utility may bill the customer for the reasonable actual cost of the tampering investigation.

History: 1983 AACS; 1996 AACS.

R 460.3410 Extension of facilities plan.

Rule 410. Each utility shall develop a plan, approved by the commission, for the extensions of facilities where the investment is in excess of that included in the regular rates for service and for which the customer is required to pay all or part of the cost.

History: 1983 AACS; 1996 AACS.

R 460.3411 Extension of electric service in areas served by 2 or more utilities.

Rule 411. (1) As used in this rule:

(a) "Customer" means the buildings and facilities served rather than the individual, association, partnership, or corporation served.

(b) "Distances" means measurements which are determined by direct measurement from the closest point of a utility's existing distribution facilities to the customer's meter location and which are not determined by the circuit feet involved in any extension.

(c) "Distribution facilities" means single-phase, V-phase, and 3-phase facilities and does not include service drops.

(2) Existing customers shall not transfer from one utility to another.

(3) Prospective customers for single-phase service that are located within 300 feet of the distribution facilities of 2 or more utilities shall have the service of their choice.

(4) Prospective customers for single-phase service that are located more than 300 feet, but within 2,640 feet, from the distribution facilities of 1 or more utilities shall be served by the closest utility.

(5) Prospective customers for single-phase service that are located more than 2,640 feet from the distribution facilities of any utility shall have the service of their choice, subject to the provisions of subrule (10) of this rule.

(6) Prospective customers for 3-phase service that are located within 300 feet of the 3-phase distribution facilities of 2 or more utilities shall have the service of their choice.

(7) Prospective customers for 3-phase service that are located more than 300 feet, but within 2,640 feet, from the 3-phase distribution facilities of 1 or more utilities shall be served by the closest utility.

(8) Prospective customers for 3-phase service that are located more than 2,640 feet from the 3-phase distribution facilities of any utility shall have the service of their choice, subject to the provisions of subrule (10) of this rule.

(9) Regardless of any other provisions in these rules, a prospective industrial customer, as defined under the industrial classification manual, division D, manufacturing, for 3-phase service that will have a connected load of more than 500 kilowatts shall have its choice of service from any nearby utility that is willing to construct the necessary facilities. The facilities that are constructed to serve an industrial customer that would otherwise have been served by another utility shall not qualify as a measuring point in determining which utility will serve new customers in the future.

(10) The extension of distribution facilities, except as provided in subrules (3), (4), (6), and (7) of this rule, where an extension will be located within 1 mile of another utility's distribution facilities, shall

not be made by a utility without first giving the commission and any affected utility 10 days' notice of its intention by submitting a map showing the location of the proposed new distribution facilities, the location of the prospective customers, and the location of the facilities of any other utility in the area. If no objections to the proposed extension of distribution facilities are received by the commission within the 10-day notice period, the utility may proceed to construct the facilities. If objections are received, the determination of which utility will extend service may be made the subject of a public hearing and a determination by the commission, upon proper application by any affected party.

(11) The first utility serving a customer pursuant to these rules is entitled to serve the entire electric load on the premises of that customer even if another utility is closer to a portion of the customer's load.

(12) A utility may waive its rights to serve a customer or group of customers if another utility is willing and able to provide the required service and if the commission is notified and has no objections.

(13) Nothing contained in these rules shall be construed to circumvent the requirements of Act No. 69 of the Public Acts of 1929, as amended, being S460.501 et seq. of the Michigan Compiled Laws, or to authorize a utility to extend its service into a municipality then being served by another utility without complying with the provisions of Act No. 69 of the Public Acts of 1929, as amended.

(14) Regardless of other provisions of this rule, except subrule (9), a utility shall not extend service to a new customer in a manner that will duplicate the existing electric distribution facilities of another utility, except where both utilities are within 300 feet of the prospective customer. Three-phase service does not duplicate single-phase service when extended to serve a 3-phase customer.

(15) The first utility to serve a customer in a new subdivision under the other provisions of this rule has the right to serve the entire subdivision. In extending service to reach the subdivision, the utility shall not duplicate the existing facilities of another utility.

History: 1983 AACS; 1996 AACS.

PART 5. ENGINEERING

R 460.3501 Electric plant; construction, installation, maintenance, and operation pursuant to good engineering practice required.

Rule 501. The electric plant of the utility shall be constructed, installed, maintained, and operated pursuant to accepted good engineering practice in the electric industry to assure, as far as reasonably possible, continuity of service, uniformity in the quality of service furnished, and the safety of persons and property.

History: 1983 AACS.

R 460.3502 Standards of good practice; adoption by reference.

Rule 502. In the absence of specific rules of the commission, a utility shall apply the standards of accepted good practice that are adopted by reference in R 460.811 et seq.

History: 1983 AACS; 1988 AACS; 1996 AACS.

R 460.3503 Utility plant capacity.

Rule 503. The electric capacity regularly available from all sources shall be large enough to meet all normal demands for service and to provide a reasonable reserve for emergencies.

History: 1983 AACS; 1996 AACS.

R 460.3504 Electric plant inspection program.

Rule 504. Each utility shall adopt a program of inspection of its electric plant to ensure safe and reliable operation. The frequency of the various inspections shall be based on the utility's experience

and accepted good practice. Each utility shall keep sufficient records to verify compliance with its inspection program.

History: 1983 AACS; 1996 AACS.

R 460.3505 Utility line clearance program.

Rule 505. Each utility shall adopt a program of maintaining adequate line clearance through the use of industry-recognized guidelines. A line clearance program shall recognize the national electric safety code standards that are adopted by reference in R 460.811 et seq. The program shall include tree trimming.

History: 1996 AACS.

PART 6. METERING EQUIPMENT INSPECTIONS AND TESTS

R 460.3601 Customer-requested meter tests.

Rule 601. (1) Upon request by a customer to a utility, a utility shall make a test of the meter serving the customer. Any charge to the customer shall conform with the utility's filed and approved rates and rules. Provided, however, that the utility need not make more than 1 test in any 12-month period.

(2) The customer, or his or her representative, may be present when his or her meter is tested.

(3) A report of the results of the test shall be made to the customer within a reasonable time after the completion of the test, and a record of the report, together with a complete record of each test, shall be kept on file at the office of the utility.

History: 1983 AACS.

R 460.3602 Meter and associated device inspections and tests; certification of accuracy.

Rule 602. Every meter shall be inspected and tested, and associated device(s) shall be inspected, in the meter shop of the utility, or a meter testing facility certified by the utility, before being placed in service. The accuracy of each meter shall be certified to be within the tolerances permitted by these rules, except that the utility may rely on the certification of accuracy by the manufacturer on all new meters.

History: 1983 AACS; 2008 AACS.

R 460.3603 Meters with transformers; post-installation inspection; exception.

Rule 603. Meters with associated instrument transformers and phase shifting transformers shall be inspected to determine the proper operation and wiring connections. Inspections shall be made within 60 days after installation by a qualified person who, when possible, should be someone other than the original installer. All self-contained, socket-type meters are excluded from post-installation inspections, except that the original installation shall be inspected when the meter is installed.

History: 1983 AACS.

R 460.3604 Meters and associated devices; removal tests.

Rule 604. All meters and associated devices shall be tested after they are removed from service unless they are retired because of obsolescence.

History: 1983 AACS; 1995 AACS.

R 460.3605 Metering electrical quantities.

Rule 605. (1) All electrical quantities that are to be metered as provided in R 460.3301 shall be metered by commercially acceptable instruments which are owned and maintained by the utility.

(2) Every reasonable effort shall be made to measure at 1 point all the electrical quantities necessary for billing a customer under a given rate.

(3) 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 devices to prevent reverse registration and shall be so connected as to separately meter the energy flow in each direction, unless used to implement a utility tariff approved by the commission for service provided under a net metering program.

(4) Reactive metering shall not be employed for determining the average power factor for billing purposes where energy may flow in either direction or where the customer may generate an appreciable amount of his or her energy requirements at any time, unless suitable directional relays and ratchets are installed to obtain correct registration under all conditions of operation.

(5) 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 be requested to 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 1 schedule shall be ratcheted.

History: 1983 AACS; 2008 AACS.

R 460.3606 Nondirect reading meters and meters operating from instrument transformers; marking of multiplier on instruments; marking of charts and magnetic tapes; marking of register ratio on meter registers; watthour constants.

Rule 606. (1) Meters that are not direct reading and meters operating from instrument transformers shall have the multiplier plainly marked on the dial of the instrument or otherwise suitably marked. All charts and magnetic tapes taken from recording meters shall be marked with the date of the record, the meter number, customer, and chart multiplier, except as provided in R 460.3304.

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

(3) The watthour constant for the meter itself shall be shown on all watthour meters.

History: 1983 AACS.

R 460.3607 Watt-hour meter requirements.

Rule 607. (1) Watthour meters that are used for measuring electrical quantities supplied shall conform to ANSI specifications and meet all of the following requirements:

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

(b) Not creep at no load with all load wires disconnected at a rate of one complete revolution of the moving element in ten minutes when potential is impressed.

(c) Be accurate to within plus or minus 1.0%, referred to the portable standard watthour meter as a base, at two unity power factor loads: light load (l.l.) and heavy load (h.l.).

Meter Must be Accurate within ± 1.0% to Portable Standard			
Meter Class	Light Load Test Amperes	Heavy Load Test Amperes	Inductive Load 50% Lagging Power Factor Test Amperes
Self-Contained	10% Rated Test Amperes of Meter	75-100% Rated Test Amperes of Meter	75-100% Rated Test Amperes of Meter
Transformer Rated	5-10% Rated Test Amperes	75-100% Rated	75-100% Rated Test Amperes

	of Meter	Test Amperes of Meter	of Meter

(d) Be accurate to within plus or minus 2.0%, referred to the portable standard watthour meter as a base, at inductive load (i.l.).

(2) Polyphase meters shall have their elements in balance within 2.0% at rated test amperes at unity power factor and at approximately 50% lagging power factor.

(3) Meters that are used with instrument transformers shall be adjusted so that the overall accuracy of the metering installation meets the requirements of this rule.

(4) Meters and associated devices shall be adjusted as close as practical to zero error and within the accuracy limits specified in subrule (1)(c) of this rule.

History: 1983 AACS; 2008 AACS.

R 460.3608 Demand meters, registers, and attachments; requirements.

Rule 608. A demand meter, demand register, or demand attachment that is used to measure a customer's service shall meet all of the following requirements:

(a) Be in good mechanical and electrical condition.

(b) Have proper constants, indicating scale, contact device, recording tape or chart, and resetting device.

(c) Not register at no load.

(d) Be accurate to the following degrees:

(i) Curve-drawing meters that 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 element which serves 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.

(ii) Lagged-demand meters shall be accurate to within plus or minus 4.0% of full scale at final indication.

History: 1983 AACS.

R 460.3609 Instrument transformers used in conjunction with metering equipment; requirements; phase shifting transformers; secondary voltage.

Rule 609. (1) Instrument transformers used in conjunction with metering equipment to measure a customer's service shall meet both of the following requirements:

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

(b) Have characteristics such that the combined inaccuracies of all transformers supplying 1 or more meters in a given installation will not exceed the percentages listed in the following chart:

	100% Power Factor		50% Power Factor	
Current	10%	100%	10%	100%
Error	1%	0.75%	3%	2%

(2) Meters that are used in conjunction with instrument transformers shall be adjusted so that the overall accuracies will come within the limits specified in this part.

(3) 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. (See R 460.3613 (6).)

(4) The results of tests of instrument transformers shall be kept on record and shall be available for use.

(5) Phase shifting transformers shall have secondary voltages under balanced line voltage conditions within plus or minus 1.0% of the voltage impressed on the primary side of the transformer.

History: 1983 AACS; 2008 AACS.

R 460.3610 Portable indicating voltmeters; accuracy.

Rule 610. All portable indicating voltmeters that are used for determining the quality of service voltage to customers shall be checked against a suitable secondary reference standard at least once every 6 months for analog devices, and once every 12 months for digital devices. The accuracy of these voltmeters shall be rated so that the error of the indication is not more than plus or minus 1% of full scale. If the portable indicating voltmeter is found to be in error by more than the rated accuracy at commonly used scale deflections, it shall be adjusted.

History: 1983 AACS; 2008 AACS.

R 460.3611 Meter testing equipment; availability; provision and use of primary standards.

Rule 611. (1) A 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. The utility may, if necessary, have all or part of the required tests made, or its portable testing equipment checked, by another utility or agency which is approved by the commission and which has adequate and sufficient testing equipment to comply with these rules.

(2) At a minimum, a utility shall keep all of the following testing equipment available:

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

(b) Portable indicating instruments that are necessary 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 an approved portable standard watthour meter which is kept permanently at 1 point and which is not used for fieldwork. Standards shall be well-compensated for both classes of temperature errors, shall be practically free from errors due to ordinary voltage variations, and shall be free from erratic registration due to any cause.

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

(3) A utility shall provide and use primary standards that have accuracies which are traceable to the United States National Institute of Standards and Technology (NIST).

History: 1983 AACS; 1995 AACS.

R 460.3612 Test standards; accuracy.

Rule 612. (1) The accuracies of all primary reference standards shall be certified as traceable to the National Institute of Standards and Technology (NIST), either directly or through other recognized standards laboratories.These standards shall have their accuracy certified at the time of purchase.Standard cells shall be intercompared regularly and at least 1 standard cell shall be 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) Secondary watthour 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, within the

preceding 6 months. Each secondary standard watthour meter shall have calibration data available and shall have a history card.

(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) Regularly used working portable standard watthour meters shall be compared with a secondary standard at least once every 6 months. Infrequently used working standards shall be compared with a secondary standard before they are used.

(5) Working portable standard watthour meters shall be adjusted so that their percent registration is 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 standard.

(6) The meter accuracies required in this rule for all primary, secondary, and working standards shall be referred to 100%. Service measuring equipment shall be adjusted to within the accuracies required assuming the portable test equipment to be 100% accurate with the calibration correction taken into consideration.

History: 1983 AACS; 1995 AACS; 2008 AACS.

R 460.3613 Metering equipment testing requirements.

Rule 613. (1) The testing of any unit of metering equipment shall consist of a comparison of its accuracy with a standard of known accuracy. Units which are not properly connected or which do not meet the accuracy or other requirements of these meter and metering equipment rules at the time of testing shall be reconnected or rebuilt to meet such requirements and shall be adjusted to within the required accuracy and as close to zero error as practicable or else their use shall be discontinued.

(2) Self-contained, single-phase meters, except for combination meters (meters that include demand devices or control devices), shall be in compliance with all of the following requirements:

(a) Be checked for accuracy at unity power factor at the point where a meter is installed, at a central testing point, or in a mobile testing laboratory within a period of from 12 months before, to 60 days after, a meter is placed in service, except as provided for in R 460.3602, and in subrule (3) of this rule, and not later than 9 months after 192 months of service for a surge-resistant meter and not later than 9 months after 96 months of service for a non-surge-resistant meter.

(b) Notwithstanding the provisions of subdivision (a) of this subrule, upon application to the commission and upon receipt of an order granting approval, the testing of self-contained, single-phase meters in service shall be governed by a quality control plan as follows:

(i) Meters shall be divided into homogeneous groups by manufacturers' types, except as follows:

(A) Certain manufacturers' types shall be further subdivided into separate groups by manufacturers' serial numbers as follows:

(1) General Electric type I-30 shall be divided at serial number 20,241,829.

(2) Westinghouse type C shall be divided at serial number 16,350,000.

(3) Duncan type MF shall be divided at serial number 2,650,000.

(4) Sangamo type J meters shall be divided starting with serial number 10,000,000.

(B) Non-surge-resistant meters that are installed in nonurban areas shall be treated as separate groups by manufacturers' type.

(ii) The meters in each homogeneous group shall then be further subdivided into lots of not less than 301, and not more than 10,000, meters each, except that meters of the most recent design may be combined into lots regardless of manufacturers' type, except that where the number of meters of a single type is 8,001 or more, that number of meters shall be segregated by types for the formation of lots.

(iii) From each assembled lot, a sample of the size specified in table A-2, ANSI/ASQC Z1.9, shall be drawn annually. The sample shall be drawn at random.

(iv) The meters in each sample shall be tested for accuracy pursuant to the provisions of these rules.

(v) The test criteria for acceptance or rejection of each lot shall be based on the test at heavy load only and shall be that designated for double specification limits and an acceptable quality level (AQL) that is not higher than 2.50 (normal inspection) as shown in table B-3, ANSI/ASQC Z1.9.

(vi) The necessary calculations shall be made pursuant to Example B-3 of ANSI/ASQC Z1.9. The upper and lower specification limits, U and L, shall be 102% and 98%, respectively.

(vii) A lot shall be rejected if the total estimated percent defective (p) exceeds the appropriate maximum allowable percent defective (M) as determined from table B-3 as specified in paragraph (v) of this subdivision.

(viii) All meters in a rejected lot shall be tested within a maximum period of 48 months and shall be adjusted pursuant to the provisions of R 460.3607 or shall be replaced with meters that are in compliance with the requirements of R 460.3607.

(ix) During each calendar year, new meter samples shall be drawn as specified in this subdivision from all meters in service, with the exception that lots that have been rejected shall be excluded from the sampling procedure until all meters included in the rejected lots have been tested.

(x) The utility may elect to adopt a mixed variables-attributes sampling plan as outlined in Section A9 of ANSI/ASQC Z1.9, in which case, a lot that is not in compliance with the acceptability criteria of the variables sampling plan shall be resampled the following year using an attributes sampling plan. If the acceptability criteria of the attributes sampling plan are met, then the lot shall be considered acceptable and shall be returned to the variables sampling plan the following year. If the acceptability criteria of the attributes sampling plan are not met, then that lot shall be rejected and all meters in the lot shall be tested and adjusted or replaced within a maximum period of 36 months after the second rejection.

(xi) The plan specified in paragraph (x) of this subdivision does not alter the rules under which customers may request special tests of meters.

(c) Be checked for accuracy in all of the following situations:

(i) When a meter is suspected of being inaccurate or damaged.

(ii) When the accuracy of a meter is questioned by a customer. (See R 460.3601.)

(iii) Before use if a meter has been inactive for more than 1 year after having been in service.

(iv) When a meter has been removed from service and has not been tested within the previous 48 months.

(d) Be inspected for mechanical and electrical faults when the accuracy of the device is checked.

(e) Have the register and the internal connections checked before the meter is first placed in service and when the meter is repaired.

(f) Have the connections to the customer's circuits checked when the meter is tested on the premises or when removed for testing.

(g) Be checked for accuracy at 50% power factor when purchased and after rebuilding.

(h) A meter need not be tested or checked for any reason, except when a complaint is received, if the device was tested, checked, and adjusted, if necessary, within the previous 12 months.

(3) Notwithstanding the provisions of subrules (4)(a)(ii), (5)(a) (ii) and (6)(a)(iii) of this rule, upon application to the commission and upon receipt of an order granting approval,the solid state meters described in subrules (4), (5) and (6) of this rule in service may elect to be governed by a quality control plan as follows:

(a) Meters shall be divided into homogeneous groups by manufacturers' types.

(b) The meters in each homogeneous group shall then be further subdivided into lots of not less than 301, and not more than 10,000, meters each, except that meters of the most recent design may be combined into lots regardless of manufacturers' type, except that where the number of meters of a single type is 8,001 or more, that number of meters shall be segregated by types for the formation of lots.

(c) From each assembled lot, a sample of the size specified in table A-2, ANSI/ASQC Z1.9, shall be drawn annually. The sample shall be drawn at random.

(d) The meters in each sample shall be tested for accuracy pursuant to the provisions of these rules.

(e) The test criteria for acceptance or rejection of each lot shall be based on the test at heavy load only and shall be that designated for double specification limits and an acceptable quality level (AQL) that is not higher than 2.50 (normal inspection) as shown in table B-3, ANSI/ASQC Z1.9.

(f) The necessary calculations shall be made pursuant to Example B-3 of ANSI/ASQC Z1.9. The upper and lower specification limits, U and L, shall be 102% and 98%, respectively.

(g) A lot shall be rejected if the total estimated percent defective (p) exceeds the appropriate maximum allowable percent defective (M) as determined from table B-3 as specified in paragraph (e) of this subdivision.

(h) All meters in a rejected lot shall be tested within a maximum period of 48 months and shall be adjusted pursuant to the provisions of R 460.3607 or shall be replaced with meters that are in compliance with the requirements of R 460.3607.

(i) During each calendar year, new meter samples shall be drawn as specified in this subdivision from all meters in service, with the exception that lots that have been rejected shall be excluded from the sampling procedure until all meters included in the rejected lots have been tested.

(j) The utility may elect to adopt a mixed variables-attributes sampling plan as outlined in Section A9 of ANSI/ASQC Z1.9, in which case, a lot that is not in compliance with the acceptability criteria of the variables sampling plan shall be resampled the following year using an attributes sampling plan. If the acceptability criteria of the attributes sampling plan are met, the lot shall be considered acceptable and shall be returned to the variables sampling plan the following year. If the acceptability criteria of the attributes sampling plan are not met, then that lot shall be rejected and all meters in the lot shall be tested and adjusted or replaced within a maximum period of 36 months after the second rejection.

(k) The plan specified in paragraph (j) of this subdivision does not alter the rules under which customers may request special tests of meters.

(4) All single-phase meters that are not included in the provisions of subrule (2) of this rule, together with associated equipment, such as demand devices, control devices and instrument transformer-rated meters, shall be in compliance with all of the following requirements:

(a) Be checked for accuracy at unity power factor at the point where a meter is installed, at a central testing point, or in a mobile testing laboratory as follows:

(i) Within a period of from 12 months before, to 60 days after, a meter is placed in service, exceptions to this subrule (4)(a) of this rule are as provided for in R 460.3602 and for solid state meters.

(ii) Not later than 9 months after 144 months of service for a surge-resistant meter and not later than 9 months after 96 months of service for a non-surge-resistant meter.

(iii) When a meter is suspected of being inaccurate or damaged.

(iv) When the accuracy of a meter is questioned by a customer. (See R 460.3601.)

(v) Before use when a meter has been inactive for more than 1 year after having been in service.

(vi) When a meter is removed from service and has not been tested within a period equal to 1/2 of the normal test schedule.

(b) Be inspected for mechanical and electrical faults when the accuracy of the device is checked.

(c) Have the register and the internal connections checked before the meter is first placed in service and when the meter is repaired.

(d) Have the connections to the customer's circuits checked when the meter is tested on the premises or when removed for testing.

(e) Be checked for accuracy at 50% power factor when purchased and after rebuilding.

(f) A meter need not be tested or checked for any reason, except when a complaint is received, if the device was tested, checked and adjusted, if necessary, within the previous 12 months.

(5) All self-contained, 3-phase meters and associated equipment shall be in compliance with all of the following requirements:

(a) Be tested for accuracy at unity and 50% power factor as follows:

(i) Before being placed in service.

(ii) Not later than 9 6 months after 120 months of service.

(iii) When a meter is suspected of being inaccurate or damaged.

(iv) When the accuracy of a meter is questioned by a customer. (See R 460.3601.)

(v) When a meter is removed from service.

(b) Be inspected for mechanical and electrical faults when the accuracy is checked.

(c) Have the register and internal connections checked before the meter is first installed, when repaired and when the register is changed.

(d) Have the connections to the customer's circuits and multipliers checked when the equipment is tested for accuracy on the customer's premises.

(6) All transformer-rated, 3-phase meters and associated equipment shall be in compliance with all of the following requirements:

(a) Be checked for accuracy at unity and 50% power factor as follows:

(i) Before being placed in service.

(ii) On the customer's premises within 60 days after installation, unless the transformers are in compliance with the specifications outlined in the American National Standards Institute standard ANSI C-57.13, and unless the meter adjustment limits do not exceed plus or minus 1.5% at 50% power factor.

(iii) Not later than 9 months after 72 months of service.

(iv) When a meter is suspected of being inaccurate or damaged.

(v) When the accuracy is questioned by a customer. (See R 460.3601.)

(vi) When a meter is removed from service.

(b) Be inspected for mechanical and electrical faults when the accuracy is checked.

(c) Have the register and internal connections checked before the meter is first placed in service and when the meter is repaired.

(d) Have the connections to the customer's circuits and multipliers checked when the equipment is tested for accuracy on the premises or when removed for testing and when instrument transformers are changed.

(e) Be checked for accuracy at 50% power factor when purchased and after rebuilding.

(7) Instrument transformers shall be tested in all of the following situations:

(a) When first received, unless a transformer is accompanied by a certified test report by the manufacturer.

(b) When removed from service.

(c) Upon complaint.

(d) When there is evidence of damage.

(e) When an approved check, such as the variable burden method in the case of current transformers that is made when the meter is tested indicates that a quantitative test is required.

(8) Demand meters shall be in compliance with both of the following requirements:

(a) Be tested for accuracy in all of the following situations:

(i) Before a meter is placed in service.

(ii) When an associated meter is tested and the demand meter is a block interval nonrecording type or a thermal type.

(iii) After 2 years of service if the meter is of the recording type, but testing is not required if the meter is of the pulse-operated type and the demand reading is checked with the kilowatt-hour reading each billing cycle.

(iv) When a meter is suspected of being inaccurate or damaged.

(v) When the accuracy is questioned by a customer. (See R 460.3601.)

(vi) When a meter is removed from service.

(b) Be inspected for mechanical and electrical faults when a meter is tested in the field or in the meter shop.

History: 1983 AACS; 1995 AACS; 2008 AACS.

R 460.3614 Standards check by the commission.

Rule 614. (1) Upon request of the commission, a utility shall submit 1 of its portable standard watthour meters and 1 portable indicating voltmeter, ammeter, and wattmeter to a commission-approved standards laboratory for checking of their accuracy.

(2) A utility shall normally check its own working portable standard watthour meters or instruments against primary or secondary standards and shall calibrate these working standards or instruments before they are submitted with a record of such calibration attached to each of the working standards or instruments.

History: 1983 AACS.

R 460.3615 Metering equipment records.

Rule 615. (1) A complete record of the most recent test of all metering equipment shall be maintained. The record shall show all of the following information:

(a) Identification and location of unit.

(b) Equipment with which the device is associated.

(c) The date of test.
(d) Reason for the test.
(e) Readings before and after the test.
(f) A statement as to whether or not the meter creeps and, in case of creeping, the rate.
(g) A statement of meter accuracies before and after adjustment sufficiently complete to permit checking of the calculations employed.
(h) Indications showing that all required checks have been made.
(i) A statement of repairs made, if any.
(j) Identification of the testing standard and the person making the test.
(2) The utility shall also keep a record of each unit of metering equipment which shows all of the following information:
(a) When the unit was purchased.
(b) The unit's cost.
(c) The company's identification.
(d) Associated equipment.
(e) Essential nameplate date.
(f) The date of the last test. The record shall also show either the present service location with the date of installation or, if removed from service, the service location from which the unit was removed with the date or removal.

History: 1983 AACS.

R 460.3616 Average meter error; determination.
Rule 616. If 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 1 of the following ways:
(a) If the metering installation is used to measure a load which has practically constant characteristics, such as a streetlighting 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.
(b) 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.
(c) 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 powerfactor given a weighting of 2.
(d) 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 shall also be determined. In this case, the average error shall 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: 1983 AACS.

R 460.3617 Reports to be filed with the commission.
Rule 617. (1) A utility shall file, with the commission, within 30 days after the first day of January of each year, an officer-certified statement that the utility has complied with all of the requirements set forth in these rules relating to meter standardizing equipment.
(2) For all meters that are not included in the provisions of R 460.3613(2)(b), the utility shall file, with the commission, on or before the first day of April of each year, its annual tabulation of all of its prior-to-adjustment meter test results covering the 12-month period ending December 31. The utility shall summarize, by meter type, all individual meters and overall light and heavy load prior-to-adjustment test results at the power factors required by these rules. The summary shall be divided into
heavy load 100% power factor, light load 100% power factor, and heavy load 50% power factor test results and shall also be divided according to the length of meter test period and types of single-

phase and polyphase meters. The summary shall show the number of meters or overall tests found within each of the following accuracy classifications:

(a) No recording.
(b) Creeping.
(c) Equal to or less than 94.0%.
(d) 94.1 to 96.0%.
(e) 96.1 to 97.0%.
(f) 97.1 to 98.0%.
(g) 98.1 to 99.0%.
(h) 99.1 to 100.0%.
(i) 100.1 to 101.0%.
(j) 101.1 to 102.0%.
(k) 102.1 to 103.0%.
(l) 103.1 to 104.0%.
(m) 104.1 to 106.0%.
(n) Over 106.0%.

When a utility is subject to multiple state jurisdiction, these accuracy classifications may be modified with the approval of the commission.

(3) For all meters that are included in the provisions of R 460.3613(2)(b), the utility shall file, with the commission, on or before the first day of April, all of the following information:

(a) A summary of all samples of meter lots that pass the acceptability criteria as set forth in ANSI/ASQC Z1.9-1980, including complete data on all of the following:

(i) The type of meter.
(ii) The number of meters in a lot.
(iii) The size of the sample.
(iv) The average months in service since the last test.
(v) The computed p (total estimated percent defective in lot).
(vi) The corresponding M (maximum allowable percent defective) as determined from table B-3 in ANSI/ASQC Z1.9-1980.

(b) The necessary calculations made pursuant to Example B-3 of ANSI/ASQC Z1.9-1980 shall be retained for each sample or resample drawn. In addition to the actual computation, the data shall include all of the following:

(i) The type of meter.
(ii) The number of meters in the lot.
(iii)The meter numbers of sample meters.
(iv) The actual prior-to-adjustment test data of each meter tested.
(v) The number of months since the last test for each meter in the sample.

A sample of the calculations and data for a lot that passes the acceptability criteria shall be included in the report to the commission.

(c) A copy of the complete data, as outlined in this subrule, shall be included for each meter lot that is not in compliance with the acceptability criteria of the sampling plan employed as set forth in ANSI/ASQC Z1.9-1980.

(d) A report summarizing the testing of all meters in rejected lots that are to be returned to service. The heavy load preadjustment tests only shall be recorded, and the accuracy classifications as established in subrule (2) of this rule shall be used. Each rejected lot shall be reported separately and shall be separated into groups by the number of months since the last test as follows:

(i) 0 to 48 months.
(ii) 49 to 72 months.
(iii) 73 to 96 months.
(iv) More than 96 months.

History: 1983 AACS; 1995 AACS.

R 460.3618 Generating and interchange station meter tests; schedule; accuracy limits.

Rule 618. (1) Generating and interchange station and watthour meters shall be tested in conjunction with their associated equipment as follows:

(a) At least once every 24 months for generating station meters.

(b) At least once every 12 months for interchange meters.

(2) The accuracy limits for any particular device shall not be greater than the accuracy limits required elsewhere in these rules.

History: 1983 AACS.

PART 7. STANDARDS OF QUALITY OF SERVICES

R 460.3701 Alternating current systems; standard frequency.

Rule 701. The standard frequency for alternating current systems shall be 60 hertz. The frequency shall be maintained within limits that will permit the satisfactory operation of customers' clocks which are connected to the system.

History: 1983 AACS; 1996 AACS.

R 460.3702 Standard nominal service voltage; limits; exceptions.

Rule 702. (1) Each utility shall adopt and submit standard nominal service voltages.

(2) With respect to secondary voltages, the following provisions shall apply:

(a) For all retail service, the variations of voltage shall be not more than 5% above or below the standard nominal voltage as submitted pursuant to subrule (1) of this rule, except as noted in subrule (4) of this rule.

(b) Where 3-phase service is provided, the utility shall exercise reasonable care to ensure that the phase voltages are balanced within practical tolerances.

(3) With respect to primary voltages, the following provisions shall apply:

(a) For service rendered principally for industrial or power purposes, the voltage variation shall not be more than 5% above or below the standard nominal voltages as submitted pursuant to subrule (1) of this rule, except as noted in subrule (4) of this rule.

(b) The limitations in subdivision (a) of this subrule do not apply to special contracts in which the customer specifically agrees to accept service with unregulated voltage.

(4) Voltages outside the limits specified in this rule shall not be considered a violation if the variations are infrequent fluctuations or occur from adverse weather conditions, service interruptions, causes beyond the control of the utility, or voltage reductions that are required to reduce system load at times of supply deficiency or loss of supply.

History: 1983 AACS; 1996 AACS.

R 460.3703 Voltage measurements and records.

Rule 703. (1) Voltage measurements shall be made at the utility's service terminals.

(2) Each utility shall make a sufficient number of voltage measurements, using recording voltmeters, to determine if voltages are in compliance with the requirements stated in R 460.3702.

(3) All records obtained under subrule (2) of this rule shall be retained by the utility for not less than 2 years and shall be available for inspection by the commission's representatives. The records shall indicate all of the following information:

(a) The location where the voltage was measured.

(b) The time and date of the measurement.

(c) The results of the comparison with an indicating voltmeter at the time a recording meter is set.

History: 1983 AACS; 1996 AACS.

R 460.3704 Voltage measurements; required equipment; periodic checks; certificate or calibration card for standards.

Rule 704. (1) Each utility shall have access to at least 1 indicating voltmeter that has a stated accuracy within 0.25% of full scale. The instrument shall be maintained within its stated accuracy.

(2) Each utility shall have not less than 2 indicating voltmeters that have a stated accuracy within 1.0% of full scale.

(3) Each utility shall have not less than 2 portable recording voltmeters, or their electronic equivalent, with a stated accuracy within 1.5% of full scale.

(4) Standards shall be checked in accordance with R 460.3612.

(5) Working instruments shall be checked in accordance with R 460.3610.

(6) Each standard shall be accompanied at all times by a certificate or calibration card, duly signed and dated, on which the corrections required to compensate for errors found at the customary test points at the time of the last test are recorded.

History: 1983 AACS; 1996 AACS.

R 460.3705 Interruptions of service; records; planned interruption; notice to commission.

Rule 705. (1) Each utility shall make a reasonable effort to avoid interruptions of service. When interruptions occur, service shall be restored within the shortest time practical, consistent with safety.

(2) Each utility shall keep records of sustained interruptions of service to its customers and shall make an analysis of the records for the purpose of determining steps to be taken to prevent recurrence of the interruptions. The records shall include the following information concerning the interruptions:

(a) Cause.

(b) Date and time.

(c) Duration.

(3) Planned interruptions shall be made at a time that will not cause unreasonable inconvenience to customers and shall be preceded, if feasible, by adequate notice to persons who will be affected.

(4) Each utility shall promptly notify the commission of any major interruption of service to its customers.

History: 1983 AACS; 1996 AACS.

PART 8. SAFETY

R 460.3801 Protective measures.

Rule 801. Each utility shall exercise reasonable care to reduce the hazards to which its employees, its customers, and the general public may be subjected.

History: 1983 AACS.

R 460.3802 Safety program.

Rule 802. Each utility shall comply with the provisions of the occupational safety and health act, 29 U.S.C. S651 et seq., and Act No.154 of the Public Acts of 1974, as amended, being S408.1001 et seq. of the Michigan Compiled Laws, and known as the Michigan occupational safety and health act, and shall operate under applicable federal and state health and safety laws and regulations.

History: 1983 AACS; 1996 AACS.

R 460.3803 Energizing services.

Rule 803. When energizing services, each utility shall comply with the provisions of all applicable codes and statutory requirements, unless otherwise specified by the commission. The utility may refuse to energize a service if an unsafe condition is observed.

History: 1983 AACS; 1996 AAC.

R 460.3804 Accidents; notice to commission.

Rule 804. Each utility shall promptly notify the commission of fatalities and serious injuries that are substantially related to the facilities or operations of the facilities.

History: 1996 AACS.

R 460.3901 Rescinded.

History: 1983 AACS; 1989 AACS; 1996 AACS.

R 460.3902 Rescinded.

History: 1983 AACS; 1996 AACS.

R 460.3903 Rescinded.

History: 1983 AACS; 1996 AACS.

R 460.3904 Rescinded.

History: 1983 AACS; 1996 AACS.

R 460.3905 Rescinded.

History: 1983 AACS; 1996 AACS.

R 460.3906 Rescinded.

History: 1983 AACS; 1996 AACS.

R 460.3907 Rescinded.

History: 1996 AACS.

R 460.3908 Rescinded.

History: 1996 AACS.