In the matter, on the Commission’s own motion, to amend the rules governing the technical standards for electric service. Case No. U-18043

In the matter, on the Commission’s own motion, to review issues concerning cybersecurity and the effective protection of utility infrastructure. Case No. U-18203

At the March 29, 2018 meeting of the Michigan Public Service Commission in Lansing, Michigan.

PRESENT: Hon. Sally A. Talberg, Chairman
Hon. Norman J. Saari, Commissioner
Hon. Rachael A. Eubanks, Commissioner

ORDER AND NOTICE OF HEARING

On November 28, 2017, the Commission sought permission from the Office of Regulatory Reinvention (ORR), now the Office of Performance and Transformation, to amend the rules governing the technical standards for electric service. ORR approved the request on December 18, 2017, ORR# 2017-091 LR. The Commission submitted the draft rules to ORR and the Legislative Service Bureau for informal approvals, which were granted on January 2 and 22, 2018, respectively. The Regulatory Impact Statement was submitted to ORR on March 8, 2018, and it was approved on March 22, 2018.
To provide the public with an opportunity to comment on the proposed rules, the Commission has scheduled a public hearing, which will be held at 9:00 a.m. on May 8, 2018, at 7109 W. Saginaw Hwy., Lansing, Michigan. Any person may attend the public hearing and may offer comments on the proposed rules. The Commission encourages interested parties to become involved in the proceedings.

In addition, any person may submit written comments regarding the proposed rules. The comments should reference Case No. U-18043, and must be received no later than 5:00 p.m. on May 29, 2018. Comments received after the deadline will not be considered. Address mailed comments to: Executive Secretary, Michigan Public Service Commission, P.O. Box 30221, Lansing, MI 48909. Electronic comments may be e-mailed to mpscedockets@michigan.gov. If you require assistance prior to filing, contact the Commission Staff at (517) 284-8090 or by e-mail at mpscedockets@michigan.gov. All information submitted to the Commission in this matter will become public information available on the Commission’s website and subject to disclosure; and all comments will be filed in Case No. U-18043.

THEREFORE, IT IS ORDERED that:

A. A public hearing regarding amendment of the rules governing the technical standards for electric service shall be held at 9:00 a.m. on May 8, 2018, at 7109 W. Saginaw Hwy., Lansing, Michigan. A notice of hearing is attached to this order as Exhibit A. A copy of the proposed rulemaking is attached to this order as Exhibit B.

B. The public hearing will be legislative in nature and any person may present data, views, questions, and arguments regarding the issue. Statements may be limited in duration by the presiding officer in order to ensure that all interested parties have an opportunity to participate in
the proceedings. If necessary, the proceeding will continue on such dates as the presiding officer may schedule until all persons have had a reasonable opportunity to be heard.

C. Any person may file written comments, suggestions, data, views, questions, argument, and modifications concerning the issue. To be considered, all comments must be received at the Commission no later than 5:00 p.m. on May 29, 2018, and should reference Case No. U-18043. Comments received after the deadline will not be considered.

The Commission reserves jurisdiction and may issue further orders as necessary.

MICHIGAN PUBLIC SERVICE COMMISSION

Sally A. Talberg, Chairman

Norman J. Saari, Commissioner

Rachael A. Eubanks, Commissioner

By its action of March 29, 2018.

Kavita Kale, Executive Secretary
The Michigan Public Service Commission is considering the promulgation of amended rules governing technical standards for electric service, R 460.3101 to R 460.3908. The Commission will hold a public hearing to solicit comments from anyone who wishes to comment on the proposed rules.

The information below describes how a person may participate in this case.

You may contact the Michigan Public Service Commission, P.O. Box 30221, Lansing, Michigan 48909, (800) 292-9555 for a free copy of the proposed rules. Any person may review the rules on the Commission’s E-Docket Website at michigan.gov/mpscdockets. The rules will be published in the April 15, 2018 issue of the Michigan Register under ORR #2017-091, and may be accessed at the ORR website, http://w3.lara.state.mi.us/orr/Rules.aspx?type=dept&id=LR, under “Recent and Pending Rule Changes.”

The public hearing will be held:

DATE: May 8, 2018
TIME: 9:00 a.m.
LOCATION: 7109 W. Saginaw Hwy.
Lansing, Michigan

PARTICIPATION: Any interested person may attend and participate. The hearing site is accessible, including handicapped parking. People needing any accommodation to participate should contact the Commission’s Executive Secretary at (517) 284-8090 at least a week in advance to request mobility, visual, hearing or other assistance.

This is a proposal to adopt and amend rules governing technical standards for electric service. These rules apply to electric utility service provided by utilities that are subject to the jurisdiction of the Public Service Commission. The rules are intended to promote safe and adequate electric service to the public, to provide standards for uniform and reasonable electric practices by utilities, and to encourage efficiency and safety. The amendments to the rules reflect the emerging technological advancements in the area of metering, metering equipment inspections, and tests. In addition, the Commission proposes removing references to obsolete equipment from
the existing rules. The Commission also proposes to add a rule addressing cybersecurity and uniform reporting practices for the utilities.

The hearing will be for the purpose of providing an opportunity for all interested persons to present statements, views, data, questions, or arguments concerning the proposed rules. The public hearing will continue until all parties present have had a reasonable opportunity to present statements regarding the proposed rules. Persons presenting statements may be asked questions by the Commission and its Staff, as well as by the presiding officer. Statements may be limited in duration by the presiding officer in order to ensure that all interested parties have an opportunity to participate in the proceedings.

Written and electronic comments may be filed with the Commission and must be received no later than 5:00 p.m. on May 29, 2018. Comments received after the deadline will not be considered. Written comments should be sent to: Executive Secretary, Michigan Public Service Commission, P.O. Box 30221, Lansing, Michigan 48909. Electronic comments may be e-mailed to mpscedockets@michigan.gov. If you require assistance, contact Commission Staff at (517) 284-8090 or by e-mail at mpscedockets@michigan.gov. All information submitted to the Commission in this matter will become public information available on the Commission’s website and subject to disclosure. All comments should reference Case No. U-18043. Please do not include information you wish to remain private.

Jurisdiction is pursuant to section 7 of 1909 PA 106, section 2 of 1909 PA 300, section 5 of 1919 PA 419, sections 4 and 6 of 1939 PA 3, and sections 3, 9, and 231 of 1965 PA 380, MCL 460.557, MCL 460.55, MCL 460.4, MCL 460.6, MCL 462.2(12), MCL 16.103, MCL 16.109, and MCL 16.331.

March 29, 2018
Lansing, Michigan
These rules become effective immediately upon filing with the Secretary of State unless adopted under sections 33, 44, 45a(6), or 48 of 1969 PA 306. Rules adopted under these sections become effective 7 days after filing with the Secretary of State.


R 460.3101, R 460.3102, R 460.3204, R 460.3303, R 460.3304, R 460.3308, R 460.3309, R 460.3409, R 460.3605, R 460.3606, R 460.3608, R 460.3613, R 460.3615, and R 460.3703 of the Michigan Administrative Code are amended, and R 460.3205 is added to the Code, as follows:

PART 1. GENERAL PROVISIONS

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

Rule 101. (1) These rules apply to utility service that is provided by electric utilities that are subject 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 the state of Michigan. (See R 460.1601(3).)

(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 must be filed with, and approved by, the commission.

(5) An electric utility may petition the commission for a permanent or temporary waiver or exception from these rules for good cause shown provided that the waiver or exception is consistent with the purpose of these rules.

R 460.3102 Definitions.

Rule 102. As used in these rules:

(a) “Acceptable to the commission” means that a commission order has been obtained.
Approved by the commission” means that a commission order has been issued obtained.

(b) “Commission” means the Michigan public service commission.

d) “Customer” except as used in R 460.3411, means an account holder who purchases electric service from a utility. An individual who is a customer must be at least 18 years of age or an emancipated minor any person, firm, association, 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.

(e) “Electricity meter” means a device that measures and registers the integral of an electrical quantity with respect to time.

(f) “Electro-mechanical meter” means a meter in which currents in fixed coils react with the currents induced in the conducting moving element, generally a disk or disks, which causes their movement proportional to the energy to be measured. This meter may also be called an induction watthour meter.

(g) “File” means to deliver to the commission’s executive secretary.

(h) “Meter” or “watthour meter” unless otherwise qualified, means an electricity meter that measures and registers the integral of an electric quantity with respect to time of the active power of the circuit in which it is connected. The unit by which this integral is measured is usually the kilowatt-hour.

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

(j) “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.

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

(l) “Solid state meter” means a meter in which current and voltage act on electronic (solid state) elements to produce an output proportional to the energy to be measured.

(m) “Submit” means to deliver to the commission’s designated representative.

(n) “Utility” means a firm, corporation, an electric company, whether private, corporate, or cooperative, association, or other legal entity that is subject to operates under the jurisdiction of the commission and that distributes, sells, or provides electric service.

PART 2. RECORDS AND REPORTS

R 460.3204 Customer records; retention period; content.

Rule 204. (1) The utility shall retain, either within the utility or as contracted through a third party with access by the utility, customer records as necessary to comply with R 460.3309. The utility shall retain the records for not less than 3 years.

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

(a) Kilowatt-hour meter reading.
(b) **Metered** 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.

**R 460.3205 Security reporting.**

Rule 205. (1) To inform the commission regarding matters that may affect the security or safety of persons or property, whether public or private, an electric provider must do both of the following:

(a) Provide a written or oral annual report, individually or jointly with other electric providers, to designated members of the commission staff regarding the electric provider’s cybersecurity program and related risk planning. This report on the threat assessment and preparedness strategy must contain all of the following information:

(i) An overview of the program describing the electric provider’s approach to cybersecurity awareness and protection.

(ii) A description of cybersecurity awareness training efforts for the electric provider’s staff members, specialized cybersecurity training for cybersecurity personnel, and participation by the electric provider’s cybersecurity staff in emergency preparedness exercises in the previous calendar year.

(iii) An organizational diagram of the electric provider’s cybersecurity organization, including positions and contact information for primary and secondary cybersecurity emergency contacts.

(iv) A description of the electric provider’s communications plan regarding unauthorized actions that result in loss of service, financial harm, or breach of sensitive business or customer data, including the electric provider’s plan for notifying the commission and customers.

(v) A redacted summary of any unauthorized actions that resulted in material loss of service, financial harm, or breach of sensitive business or customer data, including the parties that were notified of the unauthorized action and any remedial actions undertaken.

(vi) A description of the risk assessment tools and methods used to evaluate, prioritize, and improve cybersecurity capabilities.

(vii) General information about current emergency response plans regarding cybersecurity incidents, domestic preparedness strategies, threat assessments, and vulnerability assessments.

(b) In addition to the information required under subrule 1(a) of this rule, an investor-owned public utility must include in its annual report an overview of major investments in cybersecurity during the previous calendar year and plans and rationale for major investments in cybersecurity anticipated for the next calendar year.

(2) As soon as reasonably practicable and prior to any public notification, an electric provider must orally report the confirmation of a cybersecurity incident to a designated member of the commission staff and to the Michigan fusion center, unless instructed otherwise by official law enforcement personnel, if any of the following occurred:

(a) A person intentionally interrupted the production, transmission, or distribution of electricity.
(b) A person extorted money or other thing of value from the electric provider through a cybersecurity attack.

(c) A person caused a denial of service in excess of 12 hours.

(d) An unauthorized person accessed or acquired data that compromises the security or confidentiality of personal information maintained by the electric provider as defined by the identity theft protection act, 2004 PA 452, MCL 445.61 to 445.79d, prior to public and customer notification.

(e) At the electric provider’s discretion, any other cybersecurity incident, attack, or threat which the electric provider deems notable, unusual, or significant.

3) For purposes of this rule, “electric provider” means any of the following:
(a) Any person or entity that is regulated by the commission for the purpose of selling electricity to retail customers in this state.
(b) A cooperative electric utility in this state.
(4) For purposes of subrule (2) of this rule, “person” means any individual, firm, corporation, educational institution, financial institution, governmental entity, or legal or other entity.

(5) For purposes of subrule (2)(c) of this rule, “denial of service” means, for an electric provider, a successful attempt to prevent a legitimate user from accessing electronic information made accessible by the electric provider or by another party on the behalf of the electric provider.

PART 3. METER REQUIREMENTS

R 460.3303 Meter reading data.
Rule 303. The meter reading data shall must include all of the following information:
(a) A suitable designation identifying the customer.
(b) Identifying number and 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.

R 460.3304 Meter data collection system.
Rule 304. A meter data collection system that takes data from recording meters shall must indicate all of the following meter information:
(a) The date of the record.
(b) The equipment numbers.
(c) A suitable designation identifying the customer.
(d) The appropriate multipliers.

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://webstoreansi.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 C12.1-2014
2004, cost $266.00, and C12.20-2010 2002, cost $94.00 $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(R2013)). Cost $179.00 $100.00.
(c) American National Standards Institute IEEE Standard Requirements for Instrument
Transformers (ANSI C57.13-20161993). Cost $92.00 $110.00.
(d) American National Standards Institute IEEE Standard for High Accuracy Instrument
Transformers, IEEE Std. C57.13.6-2005. Cost $44.00 $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.

R 460.3309 Metering inaccuracies; billing adjustments.

Rule 309. (1) An adjustment of bills for service for the period of inaccuracy shall must be
made for over registration and may be made for under registration under any of the following
conditions:
(a) If a mechanical 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 must 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 must 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 must be the starting point for determining the amount of the adjustment and shall be is
subject to R 460.115 subrule (12) of this rule.
(4) If the date when the inaccuracy in registration 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 must be calculated by timing the rate of
the 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 must be used as explained in this rule.

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

(8) In 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 must 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 must 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.

(9) If the external meter display is not operating so that the customer can determine the energy used, but the meter is recording energy correctly, then no adjustment is required. The utility shall repair or replace the meter promptly upon discovery of the failure.

PART 4. CUSTOMER RELATIONS

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 is unsafe, or 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 is 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 must 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 is 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.

PART 6. METERING EQUIPMENT INSPECTIONS AND TESTS

R 460.3605 Metering electrical quantities.
   Rule 605. (1) All electrical quantities that are to be metered as provided in R 460.3301 shall
   must be metered by commercially acceptable instruments which are owned and maintained
   by the utility.

   (2) Every reasonable effort shall must 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) A utility shall not employ Rr 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 by a utility under the same rate schedule
       shall must 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 l
schedule shall must be ratcheted. **This rule is only applicable to equipment owned by the utility.**

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 must 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 must 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 must be marked on all meter registers.

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

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

Rule 608. **A meter that records, or is capable of recording electric demand, is subject to the requirements of this rule.** 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 must be accurate to within plus or minus 2.0% of full scale throughout their working range. Timing elements measuring specific demand intervals shall must 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 must be accurate to within plus or minus 4 minutes in 24 hours.

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

R 460.3613 Metering and metering equipment testing requirements.

Rule 613. (1) The testing of any unit of metering equipment shall must consist of a comparison of its accuracy with a standard of known accuracy. Units which that do not properly connected or which that 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 must 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, **electro-mechanical, solid state, single-phase, and all network** meters except for combination meters (meters that include demand devices or control devices), shall must 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, electro-mechanical, solid state, single-phase, and all network meters in service shall must be governed by a quality control plan as follows:

(i) Meters shall must be divided into homogenous groups by manufacturers’ types, and except as follows:

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

1. General Electric type L-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 must then be further subdivided into lots of not less than 301, and not more than 35,000 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 must 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 must be drawn annually. The sample shall must be drawn at random.

(iv) The meters in each sample shall must be tested for accuracy pursuant to paragraphs (v) to (xi) of this rule the provisions of these rules.

(v) The test criteria for acceptance or rejection of each lot shall must be based on the test at heavy load only and shall must 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 must be made pursuant to Example B-3 of ANSI/ASQC Z1.9. The upper and lower specification limits, U and L, shall must be 102% and 98%, respectively.

(vii) A lot shall must 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 must be tested within a maximum period of 60 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 must be drawn as specified in this subdivision from all meters in service, with the exception that lots that have been rejected shall must 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 the utility shall reject that lot and all meters in the lot shall must 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 except when a complaint is received.

(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) (3) All single-phase instrument rated electro-mechanical 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 except when a complaint is received.

(5) (4) All self-contained electro-mechanical and solid state 3-phase meters and associated equipment shall must be in compliance with all of the following requirements.

However, a utility may elect to include self-contained solid state 3-phase meters in service in its quality control plan as provided for in R 460.3613(2)(b). Therefore, a utility may be exempt from the periodic meter test requirements as provided in subrule (4)(a)(ii) of this rule.

(a) Be tested for accuracy at unity and 50% power factor as follows:
   (i) Before being placed in service.
   (ii) Not later than 96 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 and put back in 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) (5) All transformer-rated electro-mechanical and solid state 3-phase meters and associated equipment shall must be in compliance with all of the following requirements.

However, a utility may elect to include transformer-rated solid state 3-phase meters in service in its quality control plan as provided for in R 460.3613(2)(b). Therefore, a utility may be exempt from the periodic meter test requirements as provided in subrule (5)(a)(iii) of this rule.

(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 and put back in 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) (6) A utility shall test 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 and put back in 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 must 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.

R 460.3615 Metering equipment records.
Rule 615. (1) A utility shall maintain A a complete record of the most recent test of all metering equipment shall be maintained. The record shall must 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 datae.
(f) The date of the last test. The record **shall must** 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.

**PART 7. STANDARDS OF QUALITY OF SERVICES**

R 460.3703 Voltage measurements and records.

Rule 703. (1) **A utility shall make** 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. **For installations in which the meter measures voltage variations, measurements using recording voltmeters are not necessary unless records of the measurements through the meter are not available.**

(3) All records obtained under subrule (2) of this rule **shall must** be retained by the utility for not less than 2 years and **shall must** 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) **For installations without meters that measure voltage variations, the results of the comparison with an indicating voltmeter at the time a recording meter is set.**