

**FLORIDA PUBLIC SERVICE COMMISSION**

**DOCKET NO: 961379-EG**

**RULE TITLE:**

**RULE NO.:**

**Record of Metering Devices and Metering**

**Device Tests**

**25-6.022**

**Test Procedures and Accuracies of**

**Consumption Metering Devices**

**25-6.052**

**Requirements As to Use of Instrument**

**Transformers**

**25-6.053**

**Laboratory Standards**

**25-6.054**

**Portable Standards**

**25-6.055**

**Metering Device Test Plans**

**25-6.056**

**Methods of Meter Test**

**25-6.057**

**Determination of Average Meter Error**

**25-6.058**

**PURPOSE AND EFFECT: Makes the rules generally consistent with American National Standard for Electric Meters-Codes for Electric Metering (ANSI C12.1-1995).**

**SUBJECT AREA TO BE ADDRESSED: Record of Meters Test, Test Procedures and Accuracies of Meters, Laboratory Testing Equipment, Portable Standards, Periodic Meter Tests, Determination of Average Meter Error, Requirements as to Use of Instrument Transformers, Methods of Meter Test.**

**SPECIFIC AUTHORITY: 366.05(1) FS.**

**LAW IMPLEMENTED: 366.05(1), 366.05(3) FS.**

**IF REQUESTED AND NOT DEEMED UNNECESSARY BY THE AGENCY HEAD, A RULE**

**DOCUMENT NUMBER-DATE**  
**13211 DEC 11 8**  
**FPSC-RECORDS/REPORTING**

DEVELOPMENT WORKSHOP WILL BE HELD ON THE TIME, DATE, AND PLACE SHOWN BELOW:

TIME AND DATE: 9:30 a.m., January 24, 1997

PLACE: Florida Public Service Commission, Betty Easley Conference Center, Room 152, 4075 Esplanade Way, Tallahassee, FL 32399-0850.

THE WORKSHOP REQUEST MUST BE SUBMITTED IN WRITING WITHIN 21 DAYS OF THE DATE OF THIS NOTICE TO THE COMMISSION'S DIVISION OF RECORDS AND REPORTING, 2540 SHUMARD OAK BOULEVARD, TALLAHASSEE, FL 32399-0850.

THE PERSON TO BE CONTACTED REGARDING THE PROPOSED RULE DEVELOPMENT IS: Director of Appeals, Florida Public Service Commission, 2540 Shumard Oak Blvd., Tallahassee, FL 32399-0862.

THE PRELIMINARY TEXT OF THE PROPOSED RULE DEVELOPMENT IS:

**25-6.022 Record of Meters and Meter Tests Metering Devices and Metering Device Tests.**

(1) For all types of utility-performed tests, a test record shall be made whenever a unit of metering equipment is tested, but need not be retained after the equipment is again tested. The record shall show information to identify the unit and its location; equipment with which the unit is associated; the date of the test; reason for the test; readings before and after the test; if the meter creeps, a statement as to the rate of creeping; a statement of the "as found" accuracy; indications showing that all required checks have been made; a statement of repairs made, if any; and identification of the person making the test. The completion of each test will signify the "as left" accuracy falls

within the required limits specified in Rule 25-6.052, unless the meter is to be retired.

(2) Each utility shall keep a record for each unit of metering equipment showing the date the unit was purchased, if available; the utility's identification; associated equipment; essential name plate data; date of test; results of "as found" test; and location where installed with date of installation.

~~(3) Each utility shall maintain its meter test records in such a manner that the following information is readily available to the Commission on request:~~

~~(a) The time elapsed between meter tests.~~

~~(b) The type of meter, such as single phase or polyphase watt-hour meter.~~

~~(c) The number of meters which the full load "as found" tests indicate falls within each of the following accuracy classifications:~~

~~1. Under 98.0%~~

~~2. 98.0% to 102.0%~~

~~3. Over 102.0%~~

~~(d) For those meters tested under an approved statistical sampling plan, provision (c) shall be maintained by type or age groups.~~

(3) Records of Tests for Incoming Purchases. Regardless whether the newly purchased metering equipment is tested under a Random Sampling Plan, each utility shall maintain and make



available to the Commission for each purchase of new meters and associated devices made during the calendar or fiscal year, the following information:

(a) Type of equipment, including manufacturer, model number, and any features which will subsequently be used to classify the units purchased into a population of units for in-service tests;

(b) The number of units purchased;

(c) The total number of units tested;

(d) The number of units tested measuring each percent registration recorded;

(e) Average percent registration;

(f) Standard deviation about the average percent registration (population or sample standard deviation);

(g) Results regarding whether the units tested meet the utility's acceptance criteria; and

(h) If a utility does not perform its tests for incoming purchases, the data provided by equipment manufacturers concerning units tested on a 100 percent basis by the manufacturer, with the manufacturer's test results used as a basis for acceptance testing, shall also be retained.

(4) Records of Periodic and Annual In-Service Meters Tests. Each utility shall maintain test records for each periodic and annual in-service test of electric meters and associated devices in such a manner that the information listed in paragraphs (4)(a) through (h) is readily available to the Commission on request.

These data shall be maintained for units of metering equipment tested under approved Random Sampling Plans and for units tested under periodic testing programs, and shall be summarized on an annual basis.

(a) Type of equipment, including manufacturer, model number, and any features which are currently used to classify the units tested into a population of units for in-service tests;

(b) The number of units in the population;

(c) The total number of units tested;

(d) The number of units tested measuring each percent registration recorded;

(e) Average percent registration;

(f) Standard deviation about the average percent registration (population or sample standard deviation);

(g) Results showing whether the units tested under an approved random sampling program meet the utility's acceptance criteria; and

(h) A statement of the action to be taken to make further tests or replace inaccurate units, when the units tested under an approved random sampling program do not meet the acceptance criteria.

(i) The information regarding units tested during the year but not tested under a Random Sampling Plan or a periodic testing program need not be maintained as listed in paragraphs (4)(a) through (h) or be summarized on an annual basis.

Specific Authority: 366.05(1), F.S.

Law Implemented: 366.05(1), F.S.

History - New 7-29-69, Formerly 25-6.22

**25-6.052 Test Procedures and Accuracies of Meters Consumption  
Metering Devices.**

~~(1) Watt hour Meters. The performance of an in service watt hour meter is considered to be acceptable when the meter disk does not creep and when the average percentage registration is not more than 102% nor less than 98%, calculated in accordance with USAS C12.~~

~~(2) Watt hour Meter Test Procedures. The following procedures shall apply to the testing and adjusting of meters and/or associated devices.~~

~~(a) The test of any unit of metering equipment shall consist of a comparison of its accuracy with the accuracy of a standard.~~

~~(b) Adjustment limits. When a test of a singlephase watt hour meter indicates that the error in registration exceeds 1% at either light load or heavy load, at unity power factor, the percentage registration shall be adjusted to within these limits or error as closely as practicable to the condition of zero error. When a test of a polyphase watt hour meter indicates that the error in registration exceeds 1% at either light load or heavy load, at unity power factor, or exceeds 2% at heavy load at approximately 0.5 power factor lag, the percentage registration of the meter shall be adjusted to within these limits of error as closely as~~



~~practicable to the condition of zero error.~~

~~(c) Meters shall not "creep", i.e., there shall be no continuous rotation of the moving element of a meter at a speed in excess of one revolution in ten minutes when the meter load has been removed and voltage is applied to the potential elements of the meter.~~

~~(3) Demand Meters and Registers.~~

~~(a) The performance of a demand meter or register shall be acceptable when the error of registration does not exceed 4% in terms of full scale value, when tested at any point between 25% and 100% of full scale value.~~

~~(b) When a test of a demand meter or register indicates that the error in registration exceeds plus or minus 4% in terms of full scale value, the demand meter or register shall be adjusted to within plus or minus 2% of full scale value. When a timing element also serves to keep a record of the time of day at which the demand occurs, it shall be adjusted if it is found to be in error by more than plus or minus two minutes per day.~~

~~(c) Demand meters which are direct driven shall be tested at a load point no less than 50% of full scale. However, they may be tested at a lower scale point if conditions warrant.~~

~~Tests shall be continuous for at least one demand interval unless results over a portion of an interval can be accurately determined.~~

~~(d) Demand meters which are actuated by pulses shall be~~

~~tested by transmitting enough pulses to cause the meter to register at a load point no less than 50% of full scale. If a pulse actuated demand meter is equipped with a device which records the number of pulses received by the meter, and if there is frequent and accurate comparison of such record with the number of kilowatt hours registered on the associated watt hour meter, then it is not necessary to make a periodic field test of the demand meter.~~

~~(e) Demand meters shall be adjusted to indicate zero under no load conditions, and shall be checked to ascertain that the meter resets to zero.~~

~~(f) Impulse devices associated with demand meters must be checked for proper operation.~~

~~(g) The total time interval, including reset time, must be accurate with 0.5%, except that when a timing element also serves to keep a record of the time of day at which the demand occurs, it shall be adjusted if it is found to be in error by more than plus or minus two minutes per day.~~

~~(4) Lagged Demand Meters. Lagged demand meters shall be tested and adjusted as prescribed in USAS C12.~~

(1) Watthour Meters. The performance of an in-service watthour meter shall be acceptable when the meter does not creep and the average percent registration is not more than 102 percent nor less than 98 percent, calculated in accordance with Rule 25-6.05B.

(2) Demand Meters and Registers.



(a) The performance of a mechanical or lagged demand meter or register shall be acceptable when the error of registration does not exceed four percent in terms of full-scale value, when tested at any point between 25 percent and 100 percent of full-scale value.

(b) The performance of an electronic demand meter or register shall be acceptable when the error of registration does not exceed two percent of reading, when tested at any point between 10 percent and 100 percent of full-scale value.

(c) Demand meters shall indicate zero under no-load conditions.

(3) Meter Equipment Test Procedures.

(a) The test of any unit of metering equipment shall consist of a comparison of its accuracy with the accuracy of a standard.

(b) Watthour meters and associated devices shall be tested for accuracy and adjusted in accordance with in ANSI C12.1 - 1995.

(c) Totally solid-state meters that compute demand from watthour meter registration and programmed demand algorithms shall be tested and adjusted in accordance with ANSI C12.1 - 1995. Demand registration need not be tested, provided the meter has been inspected to contain the correct demand algorithm whenever watthour registration is tested.

(4) Test Procedures.

(a) Each utility shall submit its test procedures for review and approval for all types of metering equipment, including:

1. Single-phase watthour meters;
2. Polyphase watthour meters;
3. Demand meters;
4. Pulse initiating meters;
5. Pulse recorders;
6. Time-of-use meters; and
7. Instrument Transformers.

(b) Test procedures shall contain the following for each type of metering device covered;

1. Adjustment limits;
2. Test points;
3. Test duration;
4. Type of test - single-phase test, polyphase test, etc.; and
5. Description of the general steps involved.

(c) Any changes to a previously approved test procedure must be submitted to the Commission's Division of Electric and Gas for approval. Adding a meter type to a previously approved test procedure is a change which requires approval.

(d) Review of Proposed Test Procedures. Except where a utility has requested a formal ruling by the Commission, within 90 days after submission, the Division of Electric and Gas shall review each utility's proposed test procedures to determine whether they satisfy the criteria set forth in subsections (4)(a) and (b) above and shall notify the utility in writing of its decision

accepting or rejecting the proposed procedures. If a proposed procedure is rejected, the written notice of rejection shall state clearly the reasons for rejecting the proposed procedure. If a utility's proposed procedure is rejected, the utility shall submit a revised procedure to the Commission within 60 days after receiving the notice of rejection. Where a utility has requested staff review of its procedures and a procedure has been rejected, the utility may petition the Commission for approval of the procedure. If a utility has not submitted a satisfactory procedure within six months following the submission of the initially proposed procedure, the Commission may prescribe by order a procedure for the utility.

Specific Authority: 366.05(1), F.S.

Law Implemented: 366.05(3), F.S.

History - Amended 7-29-69, Formerly 25-6.52.

~~25-6.053 Requirements As to Use of Instrument Transformers.~~

~~(1) All current and potential transformers shall be tested for accuracy in accordance with the procedures prescribed in American Standards Institute Code USA6 C57.13.~~

~~(2) Any utility unable to perform the above test due to lack of proper equipment may have its instrument transformers tested by another utility whose testing equipment conforms to the requirements of the Commission.~~

~~(3) In lieu of utility testing of instrument transformers, the Commission accepts the certificate of test as furnished by the~~



manufacturer.

~~(4) Current or potential transformers shall not be installed if their accuracy does not fall within the 0.6 accuracy class as described in USAS C57.13.~~

~~(5) The results of the last test of instrument transformers shall be kept on record.~~

Specific Authority: 366.05(1), F.S.

Law Implemented: 366.05(1), F.S.

History - Amended 7-20-69, Formerly 25-6.53.

**25-6.054 Laboratory Testing Equipment Standards.**

(1) Each utility shall have available one or more ~~laboratory working standard watt-hour meters~~ watthour meters to be used as basic reference standards. The watthour meters must have an adequate capacity and voltage range to test all ~~to check each of the portable standard watt-hour meters (shop standards)~~ portable standards used by the utility and must meet the requirements described in Rule 25-6.055(1).

(a) ~~laboratory working standard watt-hour meters~~ Watthour meters used as basic reference 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,~~ 0.05 percent at 1.00 power factor or by more than 0.10 percent at 0.50 power factor. and Watthour meters shall not be used to check or calibrate portable standard ~~watt-hour~~ watthour meters ~~(shop standards)~~ unless the ~~laboratory working standard basic reference standard watt-hour~~ watthour meter has been checked

and adjusted, if necessary, to ~~such~~ the prescribed accuracy within the preceding twelve months.

~~(b) Each laboratory working standard watt-hour meter shall have a calibration history record available. The percent registration of each basic reference standard watthour meter shall be compared with the percent registration of all other basic reference standard watthour meters used by the utility at frequent intervals.~~

~~(2) Each utility shall have available laboratory indicating working standards to check each of the portable indicating standards described in Rule 25-6.055(2).~~

~~(a) Laboratory indicating working standards shall not be in error by more than plus or minus 0.25% of scale indication at commonly used scale deflection, and shall not be used to check or calibrate portable indicating shop instruments unless the laboratory indicating working standard has been checked and adjusted, if necessary, within the preceding twelve months.~~

~~(b) Each laboratory indicating working standard shall have a calibration record available.~~

(2) Each utility shall establish traceability of its watthour standard to the national standards at least annually using one of the following methods:

(a) Through the Measurement Assurance Program (MAP) in which the National Institute of Standards and Technology (NIST) has provided a transport standard; or

(b) Through a transport standard which is of the same nominal value and of quality equal to the basic reference standards that are sent to NIST or to an independent laboratory approved by the Commission.

~~(2) Once each year, one laboratory working standard watt-hour meter and one laboratory indicating working standard shall be submitted to a testing agency as approved by the Commission for a check for accuracy.~~

(3) If excessive variation in the percent registration of a watthour meter used as a basic reference standard is observed in the comparisons in Section 25-6.054(1b) and Section 25-6.054(2b), the utility shall investigate the source of the variation. If the cause of the excessive variation cannot be corrected, use of the watthour meter as a basic reference standard shall be discontinued.

(4) Each utility shall maintain historical performance records for each watthour meter used as a basic reference standard for the following types of comparisons:

(a) Comparisons of basic reference standards with national standards; and

(b) Intercomparisons made with other basic reference standards.

Specific Authority: 366.05(1), F.S.

Law Implemented: 366.05(1), F.S.

History - New 7-29-69, Amended 4-13-80, 5-13-85, Formerly 25-6.54.

**25-6.055 Portable Standards.**



(1) Each utility shall have one or more ~~portable standard watt-hour meters (shop standard)~~ of watthour meters to be used as portable standards, which shall have adequate capacity and voltage range adequate to test all watt-hour watthour meters used by the utility for billing purposes.

(a) All portable standard ~~watt-hour~~ watthour meters, ~~(shop standard) when regularly used,~~ shall be compared with a ~~laboratory working standard~~ basic reference standard once a ~~week~~ year, or at ~~such intervals as approved by this Commission, on a commonly used current and voltage range. A complete check should be made every three months. Such equipment infrequently used shall be compared before use.~~

(b) Each portable standard ~~watt-hour~~ watthour meter ~~(shop standard)~~ shall be adjusted, if necessary, so that its accuracy will be within plus or minus ~~0.3%~~ 0.10 percent at 1.00 power factor and within plus or minus 0.20 percent at 0.50 power factor.

~~(2) Each utility shall have one or more portable indicating shop standards of various types as required to determine the quality of service being rendered to customers, and to calibrate instruments used in field work.~~

~~(a) Portable indicating shop standards shall not be in error by more than plus or minus 0.5% of indication at full scale deflection.~~

~~(b) Each portable indicating shop standard shall be adjusted,~~

~~if necessary, at quarterly intervals, and those in constant use should be checked at least every two weeks.~~

~~(3) Each portable standard shall be accompanied at all times by a certificate or calibration card, duly signed and dated, on which are recorded the corrections required to compensate for errors found at the customary test points at the time of the last previous test.~~

~~(4) For standards used in survey work and for routine or general operating information, the limits of accuracy as specified above need not prevail, but such instruments shall be within the range of accuracy necessary to obtain reliable data.~~

(2) If excessive variation in the percent registration of a watthour meter used as a portable standard is observed in the comparisons in Section 25-6.055(1), the utility shall investigate the source of the variation. If the cause of the excessive variation cannot be corrected, use of the watthour meter as a basic reference standard shall be discontinued.

(3) The calibration history of each standard shall be made available to the Commission upon request.

Specific Authority: 366.05(1), F.S.

Law Implemented: 366.05(1), F.S.

History - New 7-29-60, Amended 5-13-85, Formerly 25-6.55.

**25-6.056 Periodic Meter Tests Metering Device Test Plans.**

(1) The test of any unit of metering equipment shall consist of a comparison of its accuracy with a standard of known accuracy.

Units not meeting the accuracy or other requirements of Rule 25-6.052 at the time of the test shall be corrected to meet such requirements and adjusted to within the required accuracy and as close to 100% percent accurate as practicable or their use discontinued.

(2) All metering device tests shall be retained by the utility and made available to the Commission pursuant to Rule 25-6.022.

(3) New instrument transformers shall be tested before initial installation. Instrument transformers which have been removed from service shall be tested prior to reinstallation if the reason for removal, ~~or~~ physical appearance, or record of performance gives cause to doubt its reliability.

(4) All watt-hour metering equipment listed in Rule 6.052(4)(a) meters and demand meters associated with them shall be tested:

(a) When they are suspected by the utility of being inaccurate or damaged; and

(b) Before initial and each successive installation, either by the utility or the manufacturer, with the exception of ~~watt-hour meters~~ units of metering equipment which are statistically sample tested by the utility under an approved Random Sampling Plan.

~~(c) New single phase and polyphase, self-contained watt-hour meters shall be tested, either on a one hundred percent (100%) basis or a statistically sampled basis under an approved Random~~



~~Sampling Plan, upon receipt from the manufacturer.~~

~~(d) In service, single phase and polyphase, self contained watt-hour meters may be sample tested under an approved Random Sampling Plan.~~

~~(e) In service, single phase and polyphase self contained watt-hour meters which are not included in an approved Random Sampling Plan, and single phase and polyphase meters used with instrument transformers Plan shall be tested periodically according to the following schedule:~~

~~1. meters with surge proof magnets at least once in sixteen (16) years.~~

~~2. meters without surge proof magnets at least once in eight (8) years.~~

~~(f) In service block interval demand register equipped watt-hour watt-hour meters shall be tested periodically according to the following schedule:~~

~~1. meters with surge proof magnets at least once in twelve (12) years.~~

~~2. meters without surge proof magnets at least once in eight (8) years.~~

~~(g) Block interval graphic watt-hour demand meters shall be tested at least once in two (2) years.~~

~~(h) Lagged demand meters shall be tested at least once in eight (8) years.~~

~~(i) Pulse recorders and pulse operated demand meters used for~~

~~billing in combination with pulse initiator equipped watt hour meters shall be tested at least once in two (2) years. If a comparison is made between the watt hour meter registration and the recording registration each billing period, and the recorder registration agrees within one percent (1%) of that registered by the associated watt hour meters the schedule for pulse recorders and pulse operated demand meters should be as follows:~~

~~1. Meters with surge proof magnets at least once in sixteen (16) years.~~

~~2. Meters without surge proof magnets at least once in eight (8) years.~~

~~If the recorder meter registration checks do not agree within one percent (1%), the demand metering equipment should be tested.~~

(5) Acceptance Testing. Tests for all new units of metering equipment may be performed according to one of three plans:

1. On a 100 percent basis, with testing performed by the utility;

2. On a statistically sampled basis under an approved Random Sampling Plan, with testing performed by the utility;

or

3. On a 100 percent basis, with testing performed by the manufacturer and the test results for each unit provided by the manufacturer and maintained by the utility.

(6) In-Service Testing.

(a) In-service metering devices may be sample tested under an

approved Random Sampling Plan.

(b) In-service metering devices which are not included in an approved Random Sampling Plan shall be tested periodically. The periodic testing schedule for equipment not included in an approved Random Sampling Plan must be approved by the Commission.

(7) Random Sampling Plans and Periodic In-Service Testing Schedules Submitted for Approval.

(a) Commission approved Random Sampling Plans may be used to accept or reject shipments of newly purchased equipment and to estimate the average accuracy of equipment in service.

(b) Random Sampling Plans published by the United States Department of Defense or by The American Society for Quality Control, or any other sampling plans which have been approved by the Commission prior to the effective date of this rule need not be re-approved for the types of equipment for which they were approved.

(c) Each Random Sampling Plan submitted for approval shall include, at a minimum, the following information:

1. Plans to more closely monitor populations of equipment in service for which estimates indicate accuracy problems, to determine if units in the population need to be adjusted or replaced (in-service sampling plans).

2. A statement of the plan's statistical design and the rationale for using the plan in lieu of testing 100 percent of the units in the population.



3. A precise statement of the plan's null hypothesis and alternative hypotheses, the probability of committing Type I error and Type II error, and the criteria for accepting or rejecting the null hypothesis.

(d) "Variables" sampling plans may use either of the "known variability" or the "unknown variability" acceptance criteria. The acceptance criteria shall be appropriately modeled. Variables sampling plans shall use the population standard deviation to measure variability unless the proposed plan is accompanied by adequate justification for using another parameter.

(8) The analysis of a proposed Random Sampling Plan, or a proposed periodic in-service testing schedule where applicable, shall include assessments of the plan's ability to detect the presence of inaccurate equipment, the economy of testing only a sample of the units in the population, the impact of having inaccurate units used for billing purposes, the number of units in the population, and the historical performance of the type of equipment covered by the proposed plan.

(9) Approval of Sampling Plans and In-Service Testing Schedules. All utilities subject to this rule shall submit to the Commission's Division of Electric and Gas a proposed Random Sampling Plan for each population of metering devices for which it intends to use a random sampling plan for acceptance testing or for in-service testing, and a proposed periodic testing schedule for each population of metering devices for which it does not submit a

proposed in-service random sampling plan. Sampling plans and in-service testing schedules must be reviewed and approved prior to their use.

(10) Review of Proposed Test Plan. As used in this subsection, the word "plan" includes periodic testing schedules as well as Random Sampling Plans. Except where a utility has requested a formal ruling by the Commission, within 90 days after submission, the Division of Electric and Gas shall review each utility's plan to determine whether it satisfies the criteria set forth in subsections (7) and (8) above and shall notify the utility in writing of its decision accepting or rejecting the proposed plan. If a proposed plan is rejected, the written notice of rejection shall state clearly the reasons for rejecting the proposed plan. If a utility's proposed plan is rejected, the utility shall submit a revised plan to the Commission within 60 days after receiving the notice of rejection. Where a utility has requested staff review of its plan and the plan has been rejected, the utility may petition the Commission for approval of the initially proposed plan. If a utility has not submitted a satisfactory plan within six months following the submission of the initially proposed plan, the Commission may prescribe by order a plan for the utility.

Specific Authority: 366.05(1), F.S.

Law Implemented: 366.05(3), F.S.

History - New 7-29-60, Amended 4-13-80, Formerly 25-6.56.

~~25-6.057 Methods of Meter Test.~~

~~(1) In all tests of watt hour meters where comparison of revolutions is made, at least nine (9) revolutions shall be taken at heavy load and two separate checks shall be made. The accuracy of the meter under test shall be the average accuracy determined from the two checks and they must agree within .2 of 1%. If, however, watt hour meters are tested on electronic test equipment, only one revolution and one check need be made.~~

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

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

~~(a) Single phase test with voltage coils in parallel and current coils in series.~~

~~(b) Individual element test with voltage coils all simultaneously energized from the same or different phases. The current shall be of such magnitude that heavy load test current on each element will be between 0.5 N and 1 N times the rated current of the meter but not more than twice the rated current, and the light load current shall be 0.1 N times the rated current of the meter. (N equals the number of elements in the polyphase watt hour meter.)~~



~~The average of the registration for each element shall be taken as the meter registration at heavy or light load, respectively.~~

~~(c) Polyphase test with a polyphase portable standard watt hour meter. The opposition method of testing for balance is satisfactory for adjusting purposes only, and then only if properly made to avoid error due to anti creep holes in disk. It must be made with at least full load current through the meter. The opposition check must be followed up with an individual element test according to method (b) above, to ascertain the registration of each element where such registration must be obtained. Means for obtaining 50% lagging power factor shall be provided for the method used.~~

Specific Authority: 366.05(1), F.S.

Law Implemented: 366.05(3), F.S.

History - Amended 7-29-69, Formerly 25-6.57.

**25-6.05B Determination of Average Meter Error.** Whenever a metering installation is tested and found to exceed the accuracy limits, the average error shall be determined in one of the following ways:

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

(2) If a single-phase metering installation is used on a varying load, the average error shall be ~~the weighted algebraic average of the error at approximately 10% and at approximately 100% of the rated test amperes of the meter, the latter being given a weighing of 4 times the former.~~ determined in one of the following ways:

(a) The weighted algebraic average of the error at approximately 10 percent and at 100 percent of the rated test amperes for the meter, the latter being given a weight of four times the former;

(b) The simple average of the error at approximately 10 percent and at approximately 100 percent of the rated test amperes of the meter, each being given an equal weight; or

(c) A single point, when calculating the error of a totally solid state meter, and the single point is an accurate representation of the error over the load range of the meter.

(3) If a polyphase metering installation is used on a varying load, the average error shall be ~~the weighted algebraic average of its error at light load (approximately 10% rated test amperes) given a weighing of 1, its error at heavy load (approximately 100% rated test amperes) and 100% power factor given a weighing of 4, and at heavy load (approximately 100% rated test amperes) and 50% lagging power factor given a weighing of 2.~~ determined in one of the following ways:

(a) The weighted algebraic average of its error at light load

(approximately 10 percent rated test amperes) given a weight of one, its error at heavy load (approximately 100 percent rated test amperes) and 100 percent power factor given a weight of four, and at heavy load (approximately 100 percent rated test amperes) and 50 percent lagging power factor given a weight of two; or

(b) A single point, when calculating the error of a totally solid state meter, and the single point is an accurate representation of the error over the load range of the meter.

Specific Authority: 366.05(1), F.S.

law Implemented: 366.05(3), F.S.

History - Amended 7-29-69, Formerly 25-6.58.