

FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 961379-EG

RULE TITLE:

RULE NO.:

Record of Metering Devices and Metering Device Tests

~~Meters and Meter Tests~~

25-6.022

Test Procedures and Accuracies of

Consumption Metering Devices Meters

25-6.052

~~Requirements as to Use of Instrument Transformers~~

25-6.053

Laboratory Standards Testing Equipment

25-6.054

Portable Standards

25-6.055

Metering Device Test Plans ~~Periodic Meter Tests~~

25-6.056

~~Methods of Meter Test~~

25-6.057

Determination of Average Meter Error

25-6.058

PURPOSE AND EFFECT: The purpose and effect of these rule amendments and repeals is to update rules relating to electric metering.

SUMMARY: The proposed rule amendments would make rules relating to electric meter testing and standards more consistent with the American National Standard for Electric Meters-Codes for Electric Metering (ANSI C12.1-1995), which includes procedures for 1) New and In-Service Meter and Instrument Transformers Tests; 2) Standards Testing and Certification; 3) Periodic Testing; 4) Random Sample Testing; and 5) Required Vendor Testing. In addition, the proposed rule changes would clarify the types of meters and testing equipment covered, require the utility to

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collect and maintain additional documentation, prescribe the requirements for seeking approval of meter testing procedures, allow the sample testing of all types of meters, and allow the use of manufacturers' test results for new meters. Finally, the contents of two existing rules would be moved to 25-6.052, F.A.C.

SUMMARY OF STATEMENT OF ESTIMATED REGULATORY COST: There would be additional costs to the Commission involving paperwork and staff time, but no additional costs to other state or local government entities.

The investor-owned electric utilities specified additional utility time and costs to comply with the new rules, but generally felt that long-run cost savings should exceed implementation costs.

There is no impact anticipated on small business, small counties or small cities. Tampa Electric Co., Gulf Power Co., and Florida Power and Light all argued that ANSI C12.1-1995 guidelines would be preferable to the Commission's rules as controlling.

Any person who wishes to provide information regarding the statement of estimated regulatory costs, or to provide a proposal for a lower cost regulatory alternative must do so in writing within 21 days of this notice.

SPECIFIC AUTHORITY: 366.05(1) FS.

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

WRITTEN COMMENTS OR SUGGESTIONS ON THE PROPOSED RULE MAY BE SUBMITTED TO THE FPSC, DIVISION OF RECORDS AND REPORTING, WITHIN 21 DAYS OF THE DATE OF THIS NOTICE FOR INCLUSION IN THE RECORD OF THE PROCEEDING.

HEARING: IF REQUESTED WITHIN 21 DAYS OF THE DATE OF THIS NOTICE, A HEARING WILL BE HELD AT THE TIME, DATE, AND PLACE SHOWN BELOW:

TIME AND DATE: 9:30 a.m., April 3, 1997

PLACE: Room 152, Betty Easley Conference Center, 4075 Esplanade Way, Tallahassee, Florida.

THE PERSON TO BE CONTACTED REGARDING THESE PROPOSED RULES IS:

Director of Appeals, Florida Public Service Commission, 2540 Shumard Oak Blvd., Tallahassee, Florida 32399-0862.

THE FULL TEXT OF THESE PROPOSED RULES IS:

25-6.022 Record of Metering Devices and Metering Device Tests ~~Meters and Meter 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) No change.

(3) Records of Test 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: ~~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) 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; ~~The time elapsed between meter tests.~~

(b) The number of units purchased; ~~The type of meter, such as single phase or polyphase watt hour meter.~~

(c) The total number of units tested; ~~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) The number of units tested measuring each percent registration recorded; For those meters tested under an approved statistical sampling plan, provision (c) shall be maintained by type or age groups.

(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) FS.

Law Implemented 366.05(1) FS.

History--New 7-29-69, Formerly 25-6.22, Amended _____.

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

(1) Watthour ~~Watt-hour~~ Meters. The performance of an in-service watthour ~~watt-hour~~ meter shall ~~is considered to be~~ acceptable when the meter ~~disk~~ does not creep and ~~when~~ the average percentage registration is not more than 102 percent ~~+~~ nor less than 98 percent ~~+~~, calculated in accordance with Rule 25-6.058 ~~USAS C12.~~

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

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

(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.
~~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 of 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) Demand meters shall indicate zero under no-load conditions. ~~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) Meter Equipment Test Procedures. Demand Meters and Registers.

(a) The test of any unit of metering equipment shall consist of a comparison of its accuracy with the accuracy of a standard. ~~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) Watthour meters and associated devices shall be tested for accuracy and adjusted in accordance with ANSI C12.1 - 1995. ~~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) 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. 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 kilo watt 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 within 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) Test Procedures, Lagged Demand Meters. ~~Lagged demand meters shall be tested and adjusted as prescribed in USAS C12.~~

(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) FS.

Law Implemented 366.05(3) FS.

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

25-6.053 Requirements as to Use of Instrument Transformers.

Specific Authority 366.05(1) FS.

Law Implemented 366.05(1) FS.

History-Amended 7-29-69, formerly 25-6.53, Repealed.

25-6.054 Laboratory Standards Testing Equipment.

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

(a) Watthour meters used as basic reference standards ~~laboratory working standard watt-hour meters~~ shall not be in error by more than plus or minus 0.05 percent at 1.00 power factor or by more than 0.10 percent at 0.50 power factor, ~~0.33 at~~ ~~loads and voltages at which they are to be used, and~~ Watthour meters shall not be used to check or calibrate portable standard watthour watt-hour meters (shop standards) unless the basic

~~reference standard watthour laboratory working standard watt hour~~
meter has been checked and adjusted, if necessary, to the
prescribed ~~such~~ accuracy within the preceding twelve months.

(b) 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. ~~Each laboratory~~
~~working standard watt hour meter shall have a calibration history~~
~~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: ~~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) Through the Measurement Assurance Program (MAP) in which
the National Institute of Standards and Technology (NIST) has
provided a transport standard; or ~~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) 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. Each laboratory indicating working standard shall have a calibration record available.

(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. 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.

(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) FS.

Law Implemented 366.05(1) FS.

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

25-6.055 Portable Standards.

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

(a) All portable standard watthour watt-hour meters, (shop standard) when regularly used, shall be compared with a basic reference standard laboratory working standard once a year, week, 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 watthour watt-hour meter (shop standard) shall be adjusted, if necessary, so that its accuracy will be within plus or minus 0.10 percent at 1.00 power factor and within plus or minus 0.20 percent at 0.50 power factor 0.34 at all voltages and loads at which the standard may be used.

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

Specific Authority 366.05(1) FS.

Law Implemented 366.05(1), (3) FS.

History-New 7-29-69, Amended 5-13-85, formerly 25-6.55, Amended

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

(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)~~(2)~~ 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)~~(3)~~ All metering equipment listed in Rule 6.052(4)(a) ~~watt hour meters and demand meters associated with them~~ shall be tested:

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

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

~~(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 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 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 meter, 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:

(a) On a 100 percent basis, with testing performed by the utility;

(b) On a statistically sampled basis under an approved Random Sampling Plan, with testing performed by the utility;

or

(c) 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) FS.

Law Implemented 366.05(3) FS.

History-7-29-69, Amended 4-13-80, formerly 25-6.56, Amended .

25-6.057 Methods of Meter Test.

Specific Authority 366.05(1) FS.

Law Implemented 366.05(3) FS.

History-7-29-69, formerly 25-6.57, Repealed .

25-6.058 Determination of Average Meter Error. No change.

(1) No change.

(2) If a single-phase metering installation is used on a varying load, the average error shall be determined in one of the following ways: 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.

(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 determined in one of the following ways: ~~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.~~

(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) FS.

Law Implemented 366.05(3) FS.

History-7-29-69, formerly 25-6.58, Amended _____.

NAME OF PERSON ORIGINATING PROPOSED RULES: Sid Matlock

NAME OF SUPERVISOR OR PERSONS WHO APPROVED THE PROPOSED RULES:

Florida Public Service Commission.

DATE PROPOSED RULES APPROVED: FEBRUARY 4, 1997

DATE NOTICE OF PROPOSED RULE DEVELOPMENT PUBLISHED IN FAW:

DECEMBER 20, 1996

If any person decides to appeal any decision of the Commission with respect to any matter considered at the rulemaking hearing, if held, a record of the hearing is necessary. The appellant must ensure that a verbatim record, including testimony and evidence forming the basis of the appeal is made. The Commission usually makes a verbatim record of rulemaking hearings.

Any person requiring some accommodation at this hearing because of a physical impairment should call the Division of Records and Reporting at (904) 413-6770 at least five calendar days prior to the hearing. If you are hearing or speech impaired, please contact the Florida Public Service Commission using the Florida Relay Service, which can be reached at: 1-800-955-8771 (TDD).

1 25-6.022 Record of Metering Devices and Metering Device
2 Tests Meters and Meter Tests.

3 (1) For all types of utility-performed tests, a test
4 record shall be made whenever a unit of metering equipment is
5 tested, but need not be retained after the equipment is again
6 tested. The record shall show information to identify the unit
7 and its location; equipment with which the unit is associated;
8 the date of the test; reason for the test; readings before and
9 after the test; if the meter creeps, a statement as to the rate
10 of creeping; a statement of the "as found" accuracy; indications
11 showing that all required checks have been made; a statement of
12 repairs made, if any; and identification of the person making the
13 test. The completion of each test will signify the "as left"
14 accuracy falls within the required limits specified in Rule
15 25-6.052, unless the meter is to be retired.

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

21 (3) Records of Test for Incoming Purchases. Regardless
22 whether the newly purchased metering equipment is tested under a
23 Random Sampling Plan, each utility shall maintain and make
24 available to the Commission for each purchase of new meters and
25 associated devices made during the calendar or fiscal year, the

**CODING: Words underlined are additions; words in
struck-through type are deletions from existing law.**

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

4 | (a) Type of equipment, including manufacturer, model
5 | number, and any features which will subsequently be used to
6 | classify the units purchased into a population of units for in-
7 | service tests; The time elapsed between meter tests.

8 | (b) The number of units purchased; The type of meter, such
9 | as single phase or polyphase watt hour meter.

10 | (c) The total number of units tested; The number of meters
11 | which the full load "as found" tests indicate falls within each
12 | of the following accuracy classifications:

13 | 1. ~~Under 98.0%~~

14 | 2. ~~98.0% to 102.0%~~

15 | 3. ~~Over 102.0%~~

16 | (d) The number of units tested measuring each percent
17 | registration recorded; For those meters tested under an approved
18 | statistical sampling plan, provision (c) shall be maintained by
19 | type or age groups.

20 | (e) Average percent registration;

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

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

25 | (h) If a utility does not perform its tests for incoming

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1 purchases, the data provided by equipment manufacturers
2 concerning units tested on a 100 percent basis by the
3 manufacturer, with the manufacturer's test results used as a
4 basis for acceptance testing, shall also be retained.

5 (4) Records of Periodic and Annual In-Service Meters Tests.

6 Each utility shall maintain test records for each periodic and
7 annual in-service test of electric meters and associated devices
8 in such a manner that the information listed in paragraphs (4) (a)
9 through (h) is readily available to the Commission on request.
10 These data shall be maintained for units of metering equipment
11 tested under approved Random Sampling Plans and for units tested
12 under periodic testing programs, and shall be summarized on an
13 annual basis.

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

17 (b) The number of units in the population;

18 (c) The total number of units tested;

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

21 (e) Average percent registration;

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

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

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1 criteria; and

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

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

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

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

12 History: New 7/29/69, Formerly 25-6.22, Amended_____.

13 25-6.052 Test Procedures and Accuracies of Consumption
14 Metering Devices Meters.

15 (1) Watthour ~~Watt-hour~~ Meters. The performance of an in-
16 service watthour ~~watt-hour~~ meter shall ~~is considered to be~~
17 acceptable when the meter ~~disk~~ does not creep and ~~when~~ the
18 average percentage registration is not more than 102 percent †
19 nor less than 98 percent †, calculated in accordance with Rule
20 25-6.058 ~~USAS C12~~.

21 (2) Demand Meters and Registers. ~~Watt-hour Meter Test~~
22 ~~Procedures. The following procedures shall apply to the testing~~
23 ~~and adjusting of meters and/or associated devices.~~

24 (a) The performance of a mechanical or lagged demand meter
25 or register shall be acceptable when the error of registration

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1 does not exceed four percent in terms of full-scale value, when
2 tested at any point between 25 percent and 100 percent of full-
3 scale value. ~~The test of any unit of metering equipment shall~~
4 ~~consist of a comparison of its accuracy with the accuracy of a~~
5 ~~standard.~~

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

10 ~~Adjustment limits. When a test of a singlephase watt hour meter~~
11 ~~indicates that the error in registration exceeds 1% at either~~
12 ~~light load or heavy load, at unity power factor, the percentage~~
13 ~~registration shall be adjusted to within these limits of error as~~
14 ~~closely as practicable to the condition of zero error. When a~~
15 ~~test of a polyphase watt hour meter indicates that the error in~~
16 ~~registration exceeds 1% at either light load or heavy load, at~~
17 ~~unity power factor, or exceeds 2% at heavy load at approximately~~
18 ~~0.5 power factor lag, the percentage registration of the meter~~
19 ~~shall be adjusted to within these limits of error as closely as~~
20 ~~practicable to the condition of zero error.~~

21 (c) Demand meters shall indicate zero under no-load
22 conditions. ~~Meters shall not "creep", i.e., there shall be no~~
23 ~~continuous rotation of the moving element of a meter at a speed~~
24 ~~in excess of one revolution in ten minutes when the meter load~~
25 ~~has been removed and voltage is applied to the potential elements~~

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1 ~~of the meter.~~

2 (3) Meter Equipment Test Procedures. ~~Demand Meters and~~
3 ~~Registers.~~

4 (a) The test of any unit of metering equipment shall
5 consist of a comparison of its accuracy with the accuracy of a
6 standard. ~~The performance of a demand meter or register shall be~~
7 ~~acceptable when the error of registration does not exceed 4% in~~
8 ~~terms of full scale value when tested at any point between 25%~~
9 ~~and 100% of full scale value.~~

10 (b) Watt-hour meters and associated devices shall be tested
11 for accuracy and adjusted in accordance with ANSI C12.1 - 1995.
12 ~~When a test of a demand meter or register indicates that the~~
13 ~~error in registration exceeds plus or minus 4% in terms of~~
14 ~~full scale value, the demand meter or register shall be adjusted~~
15 ~~to within plus or minus 2% of full scale value. When a timing~~
16 ~~element also serves to keep a record of the time of day at which~~
17 ~~the demand occurs, it shall be adjusted if it is found to be in~~
18 ~~error by more than plus or minus two minutes per day.~~

19 (c) Totally solid-state meters that compute demand from
20 watt-hour meter registration and programmed demand algorithms
21 shall be tested and adjusted in accordance with ANSI C12.1 -
22 1995. Demand registration need not be tested, provided the meter
23 has been inspected to contain the correct demand algorithm
24 whenever watt-hour registration is tested. ~~Demand meters which are~~
25 ~~direct driven shall be tested at a load point no less than 50% of~~

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1 ~~full scale. However, they may be tested at a lower scale point~~
2 ~~if conditions warrant.~~

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

6 ~~(d) Demand meters which are actuated by pulses shall be~~
7 ~~tested by transmitting enough pulses to cause the meter to~~
8 ~~register at a load point no less than 50% of full scale. If a~~
9 ~~pulse actuated demand meter is equipped with a device which~~
10 ~~records the number of pulses received by the meter, and if there~~
11 ~~is frequent and accurate comparison of such record with the~~
12 ~~number of kilo watt hours registered on the associated watt hour~~
13 ~~meter, then it is not necessary to make a periodic field test of~~
14 ~~the demand meter.~~

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

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

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

25 (4) Test Procedures, Lagged Demand Meters. Lagged demand

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1 ~~meters shall be tested and adjusted as prescribed in USAS C12.~~

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

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

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

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

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

24 (d) Review of Proposed Test Procedures. Except where a
25 utility has requested a formal ruling by the Commission, within

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1 90 days after submission, the Division of Electric and Gas shall
2 review each utility's proposed test procedures to determine
3 whether they satisfy the criteria set forth in subsections (4)(a)
4 and (b) above and shall notify the utility in writing of its
5 decision accepting or rejecting the proposed procedures. If a
6 proposed procedure is rejected, the written notice of rejection
7 shall state clearly the reasons for rejecting the proposed
8 procedure. If a utility's proposed procedure is rejected, the
9 utility shall submit a revised procedure to the Commission within
10 60 days after receiving the notice of rejection. Where a utility
11 has requested staff review of its procedures and a procedure has
12 been rejected, the utility may petition the Commission for
13 approval of the procedure. If a utility has not submitted a
14 satisfactory procedure within six months following the submission
15 of the initially proposed procedure, the Commission may prescribe
16 by order a procedure for the utility.

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

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

19 History: Amended 7/29/69, formerly 25-6.52, Amended.

20 ~~25-6.053 Requirements as to Use of Instrument Transformers.~~

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

24 ~~(2) Any utility unable to perform the above test due to~~
25 ~~lack of proper equipment may have its instrument transformers~~

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1 ~~tested by another utility whose testing equipment conforms to the~~
2 ~~requirements of the Commission.~~

3 ~~(3) In lieu of utility testing of instrument transformers,~~
4 ~~the Commission will accept the certificate of test as furnished~~
5 ~~by the manufacturer.~~

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

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

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

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

13 History: Amended 7/29/69, formerly 25-6.53, Repealed.

14 25-6.054 Laboratory Standards Testing Equipment.

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

22 (a) Watthour meters used as basic reference standards
23 laboratory working standard watt hour meters shall not be in
24 error by more than plus or minus 0.05 percent at 1.00 power
25 factor or by more than 0.10 percent at 0.50 power factor. 0.33 at

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1 ~~loads and voltages at which they are to be used, and~~ Watthour
2 meters shall not be used to check or calibrate portable standard
3 watthour watt-hour meters (shop standards) unless the basic
4 reference standard watthour laboratory working standard watt-hour
5 meter has been checked and adjusted, if necessary, to the
6 prescribed ~~such~~ accuracy within the preceding twelve months.

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

13 (2) Each utility shall establish traceability of its
14 watthour standard to the national standards at least annually
15 using one of the following methods: Each utility shall have
16 available laboratory indicating working standards to check each
17 of the portable indicating standards described in Rule
18 25-6.055(2).

19 (a) Through the Measurement Assurance Program (MAP) in
20 which the National Institute of Standards and Technology (NIST)
21 has provided a transport standard; or laboratory indicating
22 working standards shall not be in error by more than plus or
23 minus 0.25% of scale indication at commonly used scale
24 deflection, and shall not be used to check or calibrate portable
25 indicating shop instruments unless the laboratory indicating

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1 ~~working standard has been checked and adjusted, if necessary,~~
2 ~~within the preceding twelve months.~~

3 (b) Through a transport standard which is of the same
4 nominal value and of quality equal to the basic reference
5 standards that are sent to NIST or to an independent laboratory
6 approved by the Commission. Each laboratory indicating working
7 standard shall have a calibration record available.

8 (3) If excessive variation in the percent registration of a
9 watthour meter used as a basic reference standard is observed in
10 the comparisons in Section 25-6.054(1b) and Section 25-6.054
11 (2b), the utility shall investigate the source of the variation.
12 If the cause of the excessive variation cannot be corrected, use
13 of the watthour meter as a basic reference standard shall be
14 discontinued. Once each year, one laboratory working standard
15 watt-hour meter and one laboratory indicating working standard
16 shall be submitted to a testing agency as approved by the
17 Commission for a check for accuracy.

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

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

23 (b) Intercomparisons made with other basic reference
24 standards.

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

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

2 History: New 7/29/69, Amended 4/13/80, 5/13/85, formerly

3 25-6.54, Amended.

4 25-6.055 Portable Standards.

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

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

17 (b) Each portable standard watthour watt-hour meter ~~(shop~~
18 ~~standard)~~ shall be adjusted, if necessary, so that its accuracy
19 will be within plus or minus 0.10 percent at 1.00 power factor
20 and within plus or minus 0.20 percent at 0.50 power factor ~~0.33~~
21 ~~at all voltages and loads at which the standard may be used.~~

22 (2) If excessive variation in the percent registration of a
23 watthour meter used as a portable standard is observed in the
24 comparisons in Section 25-6.055(1), the utility shall investigate
25 the source of the variation. If the cause of the excessive

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1 variation cannot be corrected, use of the watt-hour meter as a
2 basic reference standard shall be discontinued. Each utility
3 ~~shall have one or more portable indicating shop standards of~~
4 ~~various types as required to determine the quality of service~~
5 ~~being rendered to customers, and to calibrate instruments used in~~
6 ~~field work.~~

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

10 ~~(b) Each portable indicating shop standard shall be~~
11 ~~adjusted, if necessary, at quarterly intervals, and those in~~
12 ~~constant use should be checked at least every two weeks.~~

13 (3) The calibration history of each standard shall be made
14 available to the Commission upon request. Each portable standard
15 ~~shall be accompanied at all times by a certificate or calibration~~
16 ~~card, duly signed and dated, on which are recorded the~~
17 ~~corrections required to compensate for errors found at the~~
18 ~~customary test points at the time of the last previous test.~~

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

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

24 Law Implemented: 366.05(1), (3), F.S.

25 History: New 7/29/69, Amended 5/13/85, formerly 25-6.55, Amended

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1 _____
2 25-6.056 Metering Device Test Plans ~~Periodic Meter Tests.~~

3 (1) The test of any unit of metering equipment shall
4 consist of a comparison of its accuracy with a standard of known
5 accuracy. Units not meeting the accuracy or other requirements
6 of Rule 25-6.052 at the time of the test shall be corrected to
7 meet such requirements and adjusted to within the required
8 accuracy ~~and~~ as close to 100 percent ~~±~~ accurate as practicable or
9 their use discontinued.

10 (2) All metering device tests shall be retained by the
11 utility and made available to the Commission pursuant to Rule 25-
12 6.022.

13 (3)~~(2)~~ New instrument transformers shall be tested before
14 initial installation. Instrument transformers which have been
15 removed from service shall be tested prior to reinstallation if
16 the reason for removal, ~~or~~ physical appearance, or record of
17 performance gives cause to doubt its reliability.

18 (4)~~(3)~~ All metering equipment listed in Rule 6.052(4)(a)
19 ~~watt-hour meters and demand meters associated with them~~ shall be
20 tested:

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

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1 (b) When they are suspected by the utility of being
2 inaccurate or damaged.

3 ~~(c) New single phase and polyphase, self contained~~
4 ~~watt hour meters shall be tested, either on a one hundred percent~~
5 ~~(100%) basis or a statistically sampled basis under an approved~~
6 ~~Random Sampling Plan, upon receipt from the manufacturer.~~

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

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

- 15 ~~1. meters with surge proof magnets at least once in~~
16 ~~sixteen (16) years.~~
- 17 ~~2. meters without surge proof magnets at least once~~
18 ~~in eight (8) years.~~

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

- 22 ~~1. Meters with surge proof magnets at least once in~~
23 ~~twelve (12) years.~~
- 24 ~~2. Meters without surge proof magnets at least once~~
25 ~~in eight (8) years.~~

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

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

5 ~~(i) Pulse recorders and pulse operated demand meters used~~
6 ~~for billing in combination with pulse initiator equipped~~
7 ~~watt hour meters shall be tested at least once in two (2) years.~~

8 ~~If a comparison is made between the watt hour meter registration~~
9 ~~and the recording registration each billing period, and the~~
10 ~~recorder registration agrees within one percent (1%) of that~~
11 ~~registered by the associated watt hour meter, the schedule for~~
12 ~~pulse recorders and pulse operated demand meters should be as~~
13 ~~follows:~~

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

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

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

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

24 (a) On a 100 percent basis, with testing performed by the
25 utility:

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

3 or

4 (c) On a 100 percent basis, with testing performed by the
5 manufacturer and the test results for each unit provided by
6 the manufacturer and maintained by the utility.

7 (6) In-Service Testing.

8 (a) In-service metering devices may be sample tested under
9 an approved Random Sampling Plan.

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

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

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

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

25 (c) Each Random Sampling Plan submitted for approval shall

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1 include, at a minimum, the following information:

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

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

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

13 (d) "Variables" sampling plans may use either of the "known
14 variability" or the "unknown variability" acceptance criteria.

15 The acceptance criteria shall be appropriately modeled.

16 Variables sampling plans shall use the population standard
17 deviation to measure variability unless the proposed plan is
18 accompanied by adequate justification for using another
19 parameter.

20 (8) The analysis of a proposed Random Sampling Plan, or a
21 proposed periodic in-service testing schedule where applicable,
22 shall include assessments of the plan's ability to detect the
23 presence of inaccurate equipment, the economy of testing only a
24 sample of the units in the population, the impact of having
25 inaccurate units used for billing purposes, the number of units

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1 in the population, and the historical performance of the type of
2 equipment covered by the proposed plan.

3 (9) Approval of Sampling Plans and In-Service Testing

4 Schedules. All utilities subject to this rule shall submit to
5 the Commission's Division of Electric and Gas a proposed Random
6 Sampling Plan for each population of metering devices for which
7 it intends to use a random sampling plan for acceptance testing
8 or for in-service testing, and a proposed periodic testing
9 schedule for each population of metering devices for which it
10 does not submit a proposed in-service random sampling plan.

11 Sampling plans and in-service testing schedules must be reviewed
12 and approved prior to their use.

13 (10) Review of Proposed Test Plan. As used in this
14 subsection, the word "plan" includes periodic testing schedules
15 as well as Random Sampling Plans. Except where a utility has
16 requested a formal ruling by the Commission, within 90 days after
17 submission, the Division of Electric and Gas shall review each
18 utility's plan to determine whether it satisfies the criteria set
19 forth in subsections (7) and (8) above and shall notify the
20 utility in writing of its decision accepting or rejecting the
21 proposed plan. If a proposed plan is rejected, the written
22 notice of rejection shall state clearly the reasons for rejecting
23 the proposed plan. If a utility's proposed plan is rejected, the
24 utility shall submit a revised plan to the Commission within 60
25 days after receiving the notice of rejection. Where a utility

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1 has requested staff review of its plan and the plan has been
2 rejected, the utility may petition the Commission for approval of
3 the initially proposed plan. If a utility has not submitted a
4 satisfactory plan within six months following the submission of
5 the initially proposed plan, the Commission may prescribe by
6 order a plan for the utility.

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

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

9 History: 7/29/69, Amended 4/13/80, formerly 25-6.56, Amended
10 _____.

11 ~~25-6.057 Methods of Meter Test.~~

12 ~~(1) In all tests of watt hour meters where comparison of~~
13 ~~revolutions is made, at least nine (9) revolutions shall be taken~~
14 ~~at heavy load and two separate checks shall be made. The~~
15 ~~accuracy of the meter under test shall be the average accuracy~~
16 ~~determined from the two checks and they must agree within .2 of~~
17 ~~1%. If however, watt hour meters are tested on electronic test~~
18 ~~equipment, only one revolution and one check need be made.~~

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

25 ~~(3) Polyphase meters shall be tested by one of the~~

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1 following three methods:

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

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

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

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

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

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struck-through type are deletions from existing law.

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

2 History: 7/29/69, formerly 25-6.57, Repealed.

3 25-6.058 Determination of Average Meter Error. Whenever a
4 metering installation is tested and found to exceed the accuracy
5 limits, the average error shall be determined in one of the
6 following ways:

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

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

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

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

25 (c) A single point, when calculating the error of a totally

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1 solid state meter, and the single point is an accurate
2 representation of the error over the load range of the meter.

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

11 (a) The weighted algebraic average of its error at light
12 load (approximately 10 percent rated test amperes) given a weight
13 of one, its error at heavy load (approximately 100 percent rated
14 test amperes) and 100 percent power factor given a weight of
15 four, and at heavy load (approximately 100 percent rated test
16 amperes) and 50 percent lagging power factor given a weight of
17 two; or

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

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

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

23 History: 7/29/69, formerly 25-6.58, Amended .

24
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