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November 17, 1997

HAND DELIVERED

Ms. Blanca S. Bayo, Director
Division of Records and Reporting
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Test Procedures for Consumption Metering Devices

Dear Ms. Bayo:

In compliance with Order No. PSC-97-0501-FOF-EG issued in Docket 961379-EG on May 1, 1997 and Rule 25-6.052(4)(d), enclosed are fifteen (15) copies of Tampa Electric Company's report on Test Procedures for Consumption Metering Devices.

Please acknowledge receipt and filing of the above by stamping the duplicate copy of this letter and returning same to this writer.

Thank you for your assistance in connection with this matter.

Sincerely,

James D. Beasley
James D. Beasley

ACK

B. U. JDB/pp
JDB/pp

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[Signature]

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FPCO-RECORDS/REPORTING

**Test Procedures For
Consumption Metering Devices**

Tampa Electric Company

November 17, 1997

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FPSC-RECORDS/REPORTING

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Test Procedures for Consumption Metering Devices

Submitted to the Florida Public Service Commission (FPSC) on November 17, 1997

Preface

On May 1, 1997 the FPSC issued new rules pertaining to revenue meter testing. In compliance with Chapter 25-6.052, Test Procedures and Accuracies of Consumption Metering Devices, Florida Administrative Code (F.A.C.), Tampa Electric Company (TEC) hereby submits for approval Test Procedures for Consumption Metering Devices.

I. Laboratory Standards

Tampa Electric Company shall maintain laboratory standards and watt-hour meters used as basic reference standards that are in full compliance with Chapter 25-6.054, Laboratory Standards, F.A.C. and ANSI C12.1

II. Portable Standards

Tampa Electric Company shall maintain watt-hour meters used as portable standards that are in full compliance with Chapter 25-6.055, Portable Standards, F.A.C. and ANSI C12.1

III. Meter Test Procedures

A. General

1. No meter which accumulates energy when voltage is applied but the load terminals are open circuited shall be accepted. Any meter that "creeps" will be repaired and retested or retired.
2. An electronic demand meter that computes demand via a programmed algorithm need not be tested after inspection to confirm the correct algorithm.
3. Retired meters will be tested, before "junking", using the appropriate procedure from below.

B. Watthour Meter Tests

1. Single Phase Watthour Meters

a. Adjustment Limits

An adjustment will be made to any meter tested when Full Load (FL) accuracy is found outside of +/- .5% or Light Load (LL) accuracy is outside of +/- 1%.

- b. **Test Points**
Full Load will be at the meter's faceplate test amps at unity power factor. Light Load will be at 10% of the meter's faceplate test amps at unity power factor.
- c. **Test Duration**
One (1) full revolution at Full Load and Light Load.
- d. **Type**
Single phase non-demand meters of types: CL 10, 20, 60, 100, 200, and 320.
- e. **General steps involved**
Visual Inspection, Creep, Full Load, Light Load

2. **Polyphase Watthour Meters**

- a. **Adjustment Limits**
An adjustment will be made to any meter tested when Full Load accuracy is found outside of +/- .5% or Light Load accuracy is outside of +/- 1%.
- b. **Test Points**
Series Full Load will be at the meter's faceplate test amps at unity and .5 power factor. Series Light Load will be at 10% of the meter's faceplate test amps at unity power factor.
- c. **Test Duration**
One (1) full revolution at Full Load and Light Load.
- d. **Type**
Polyphase non-demand meters of types: CL 10, 20, 60, 100, 200, and 320. Polyphase non-demand meters of types: CI 10, 20, 100, 200, 320, and 480.
- e. **General steps involved**
Visual Inspection, Creep, Series Full Load at Unity, Series Full Load at .5 Lag, and Series Light Load.

3. **Demand Meters**

- a. **Adjustment Limits**
An adjustment will be made to any meter tested where Full Load is found outside of +/- 1%.
- b. **Test Points**
25% to 100% of Full Scale.
- c. **Test Duration**
1 hour and 32 minutes.
- d. **Type**
Single and Polyphase demand meters of types: CL 10, 20, 100, 200, 320, and 480.

- e. **General steps involved**
Meter Accuracy Test (previously described), Timed Test, and Verify Reading.

4. **Pulse Initiating Meters**

- a. **Adjustment Limits**
Described in applicable section.
- b. **Test Points**
Series Full Load test amps at unity power factor.
- c. **Test Duration**
Minimum of one (1) full rotation.
- d. **Type**
Single and Polyphase, demand and non-demand meters of types: 61, 10, 20, 100, 200, 320, and 480.
- e. **General steps involved**
Visual, Creep, Series Full Load at Unity, Series Light Load, and %V Output Verification.

C. **Pulse Recorders**

Pulse recorders are tested by connecting pulse recorders to external pulse generator(s) and recording pulses, for a minimum of one demand interval. The number of recorded pulses will agree with the number of generated pulses, with a maximum allowable error of +/- 1 pulse.

D. **Time Of Use (TOU) Meters**

Watt-hour and demand tests, as appropriate from above. Then, verification that meter contains correct TOU program.

E. **Instrument Transformers**

- 1. **Adjustment Limits**
Not applicable.
- 2. **Test Points**
10% and 100% of CT and 90% to 110% of VT rating.
- 3. **Test Duration**
As needed.
- 4. **Type**
Revenue class current transformers and potential transformers.
- 5. **General steps involved**
Visual inspection, wire to testing equipment, and verify that instrument transformer meets the ratio and phase angle requirements, per ANSI C57.13.

IV. Acceptance of New Equipment

All new revenue meters and metering instruments are accepted by Tampa Electric Company on the basis of the manufacturers' factory test data. All new metering equipment for which manufacturer's factory test data is not available will be tested by Tampa Electric Company prior to acceptance.

Manufacturer's factory test data and test data gathered from in-house testing of any new metering equipment will be retained as required by Chapter 25-6.022, Record of Metering Devices and Metering Device Tests, F.A.C..

Tampa Electric performs an annual random sample test on the single phase, self contained, plain meter type. This plan, previously approved by the FPSC for the referenced meter type, is executed in adherence to MIL-Standard-414 (Equivalent civilian standard ANSI/ASQC Z1.9-1993). Meter populations that fail the random sample test will be retired.

Any plan to random sample additional meter type(s) will first be submitted for approval to the FPSC as required by Chapter 25-6.056.7, Random Sampling Plans Submitted for Approval, F.A.C..

All other in-service revenue meters are periodically tested according to the following schedule:

Meters used at utility inter-ties	Annually
Meters with >999 KW demand	2 years
All other demand meters	9 years
All non-demand meters not included in a random sample plan	12 years