UL Listing for Electric Meters

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for the Spring Energy Council of New England (ECNE) Conference
Meter & Revenue Protection Metering Track
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Session Objectives

- Understand Current Meter Standard Testing
- Understand Why UL is Working on Meter Standard
- Understand What's in the Draft Standard UL 2735
- Understand the Relationship with ANSI
- Status of the UL Standard Development
- Challenges of Implementing the UL Standard

Current Meter Standard Testing

Meter Testing for new and in-service meters is specified in ANSI C12.1-2008, *American National Standard for Electric Meters, Code for Electricity Metering*. Most utility commissions use this Standard a reference or the basis for their meter testing requirements.

ANSI C12.1 is focused on maintenance of meter accuracy under various test conditions along with safe meter operation under various hazard conditions such as

- Exposure to Surge Conditions
- Exposure to Temporary Overloads
- Exposure to High and Low Temperatures
- Exposure to RF
- Exposure to Magnetic Fields

ANSI
American National Standards Institute

Current ANSI C12.1 Performance Requirements

Approved American National Standard
ANSI

ANSI C12.1-2008

American National Standard
for Electric Meters

Code for Electricity Metering

Secretariat:

National Electrical Manufacturers Association

Approved June 27, 2008

American National Standards Institute, Inc.

Table 3 – List of Tests

Tests (✓) Performed In Series	Descriptions Of Certification Tests	ANSI C12.1
	No Load	Test #1
	Starting Load	Test #2
	Load Performance	Test #3
	Effect of Variation of Power Factor	Test #4
	Effect of Variation of Voltage	Test #5 or 5a
	Effect of Variation of Frequency	Test #6
	Equality of Current Circuits	Test #7
	Internal Meter Losses	Test #8
	Temperature Rise	Test #9
	Effect of Register Friction	Test #10
	Effect of Internal Heating	Test #11
	Effect of Tilt	Test #12
	Stability of Performance	Test #13
	Independence of Elements	Test #14
✓	Insulation	Test #15
✓	Voltage Interruptions	Test #16
✓	Effect of High Voltage Line Surges	Test #17
	Effect of External Magnetic Field	Test #18
	Effect of Variation of Ambient Temperature	Test #19 or 19a
	Effect of Temporary Overloads	Test #20
	Effect of Current Surges in Ground Conductors	Test #21
	Effect of Superimposed Signals	Test #22
	Effect of Voltage Variation-secondary Time Base	Test #23
	Effect of Variation of Amb. Temp.-second. Time Base	Test #24
✓	Effect of electrical Fast Transient/Burst	Test #25
✓	Effect of electrical oscillatory SWC test	Test #25a
	Effect of Radio Frequency Interference	Test #26
	Radio Frequency Conducted and Radiated Emission	Test #27
✓	Effect of Electrostatic Discharge (ESD)	Test #28
	Effect of Storage Temperature	Test #29
✓	Effect of Operating Temperature	Test #30
✓	Effect of Relative Humidity	Test #31
	Mechanical Shock	Test #32
	Transportation Drop	Test #33
	Mechanical Vibration	Test #34
	Transportation Vibration	Test #35
	Weather Simulation	Test #36
	Salt-spray	Test #37
	Raintightness	Test #38

Current Meter Testing to Standards

- Many State PUCs require that new electric meters meet ANSI C12.1 and C12.20 requirements.
- New meters are tested using all or a group of tests specified in ANSI C12.1 and C12.20, usually performed by the meter vendors.
- Meter vendors have different approaches as to what is “ANSI” qualified.

Current Meter Testing to Standards

- Onus is on utilities to insure the thoroughness and accuracy of the meter vendor ANSI testing.
- Maintenance of the ANSI depends on the meter vendor's design control and manufacturing process control
- ANSI does not do audits of meter vendors testing facilities or their manufacturing facilities

Why Look for a Different Meter Standard?

Based upon recent AMI meter problems, there has been a growing concern about AMI meter safety among Utilities and Customers

- AMI Meters catch on fire
- AMI Meters blow up
- AMI Meter disconnect power by themselves
- AMI meters look “cheap” and not robust

Why Look for a Different Meter Standard?

Leads to a growing interest in a UL listing for electric meters

- Customer: Why don't meters have a UL label?
  Are the AMI meters safe?

- Utility: Are ANSI standards "tough" enough?
  How good is the meter vendor testing?

"We have taken unprecedented steps to test our meters", said PECO President and CEO Craig Adams. "We are confident in the results of the scientific testing by independent experts. Based on our work, along with results of extensive independent testing, PECO has selected the Landis+Gyr (L+G) meter for use for our customers. And, UL (Underwriters Laboratories), a leading testing and certification company, has conducted safety performance tests using the UL safety requirements for utility meters and found that the L+G meter design we are using is fully compliant with these tests. We will continue to test and monitor our meters to ensure they meet the highest safety standards. Safety is always our top priority."

- Excerpt from PECO News Release October 9, 2012

WHY Consider UL?

UL standards are focused on safety versus meter operation.

UL is nationally recognized by Utility Customers

UL is an independent product assessment

UL has recognized this interest and has stepped forward.

UL Meter Safety Standard 2735

Currently a Draft Standard under review

Scope

All Type S and Type A electric meters rated up to 600 volts

Contents

Meter Construction Requirements

Meter Performance

Meter Markings

Standards for Components

UL Meter Safety Standard 2735

Meter Construction Requirements

Meter forms as defined in ANSI C12.10

Covers

CTs

Batteries

Service Switches

Circuit Boards

UL Meter Safety Standard 2735

Meter Performance Tests

Tests for various fault conditions

How easy to set on fire

Strength of Construction

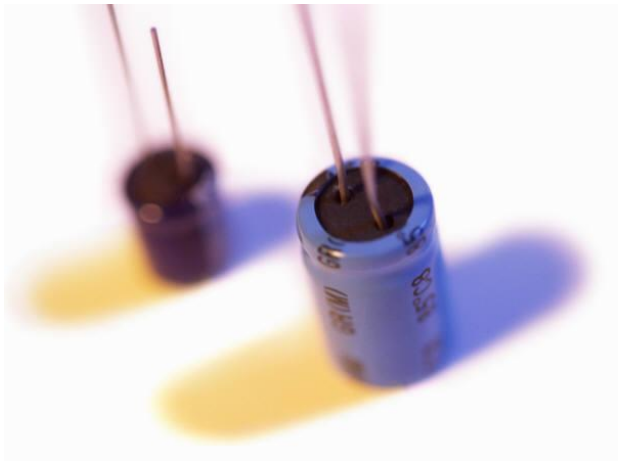
Some tests from ANSI C12.1 Section 4

UL Meter Safety Standard 2735

Component Standards

UL Standards for many meter components may apply:

- Fuses
- Transformers
- Switches
- Terminal Blocks
- Connectors



Status of the UL Standard Development

- Meter Safety Joint Working Group formed in late 2011 to develop UL Standard with assistance from ANSI C12.1 Committee. Members:
  - ANSI (Utilities and Vendors)
  - UL
- First draft posted by UL for comment in Feb 2013
- Many issues to work out

Challenges of Implementing a UL Standard

- Agreement on a common standard by UL and ANSI
- Meter vendor acceptance of the new standard
- Coordination of UL and ANSI testing of meters
- Lead Time and Cost of UL listing
- Role of 3rd Party Labs that do ANSI testing
- UL part of new meter certification process
- UL part of new component selection and design changes

Questions?

Please feel free to call or e-mail any questions

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