How Meter Services Can Relieve Customer Perceptions and Concerns About New AMI Systems

For Mississippi State Electric Power and Meter School 2023

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METER II

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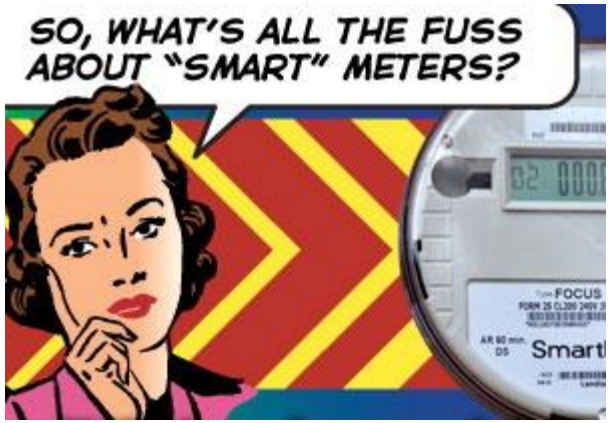
MISSISSIPPI STATE UNIVERSITY™
42nd ANNUAL ELECTRIC POWER & METERING SCHOOL

Session Objectives

- Understand Customer concerns about Smart Meters and AMI
- Be able to respond as a Utility and as a Utility Worker

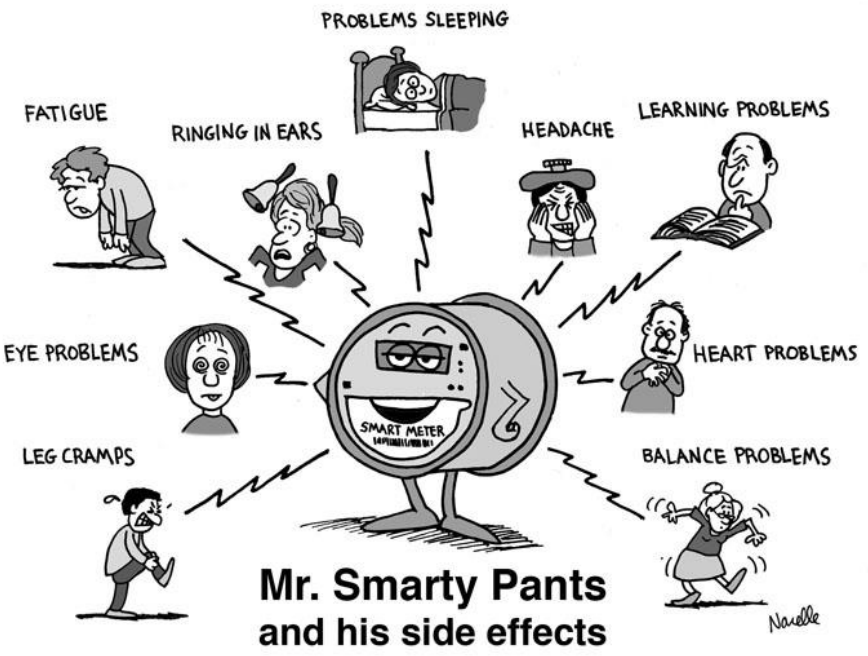


Most Common Customer Concerns

- **Health** - new AMI meter's will kill my cat or make me sick
- **Safety** – new AMI meter's will burn down my house
- **High Billing** – new AMI meter is going to increase my bill
- **Privacy** - Big Brother is watching me

Health Concerns

- RF Emissions – “Don’t they hurt me?”
- Web sites and internet information and misinformation – “But I saw a video on line…”
- Whisper down the lane – “My cousin’s, hairdressers husband’s friend said….”
- Discussion points: Cell Phones vs Meters
- Measuring RF: Demonstrating that the meter broadcasts forward as well as other sources



Safety Issues?

For the first time in our collective careers meters have been in the popular meter in an unflattering way. Segments of the general population have the perception that;

- AMI Meters may spontaneously catch fire
- AMI Meters may blow up
- AMI Meters may disconnect power by themselves
- AMI meters are “cheap computers” and are not robust enough for long term outdoor use

What Regulatory Alternatives Are Out There?

When US Consumers think about electrical safety within their home they think about licensed electricians and inspectors for electrical work and the UL Mark for products used within their home.

- 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

UL Meter Safety Standard 2735

The original release of 2735 is to be revised to conform with 2735C the Canadian version as this version is being developed jointly by UL and Utilities. Meter manufacturers have voluntarily complied with UL and have a UL mark on their meters.

What is covered:

- All Type S and Type A electric meters rated up to 600 volts and any other type of meter intended for installation within the enclosure of “complete equipment”.
- 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 unless alternate forms are specified by a Utility
- Enclosures
- Covers
- CT's, internal and external
- Batteries
- Service Switches
- Circuit Boards
- UL recognized or tested components

UL Meter Safety Standard 2735

Meter Performance Tests

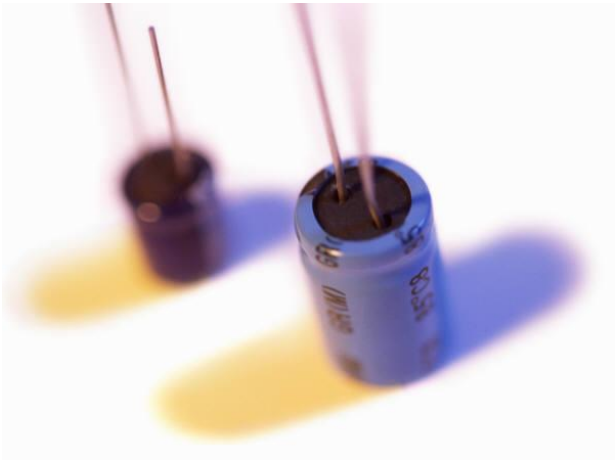
- Tests for various fault conditions
- How easy to set on fire
- Strength of Construction
- Some tests from ANSI C12.1 Section 4

UL METER SAFETY STANDARD 2735

Component Standards

UL Standards for many meter components will apply:

- Fuses
- Transformers
- Switches
- Terminal Blocks
- Connectors



Issues to Address

- UL is very interested in capitalizing on this opportunity to regulate electric meters – a market they have been excluded from in the past by the NFPA
- Draft Standard 2735 was issued without any prior notification to the ANSI C12 Main Committee despite assurances that UL would work with and participate with ANSI to avoid a Standard that contradicts the complementary ANSI standard
- UL is now working in Canada with the Canadian Utilities who are participants at the ANSI meetings to publish UL 2735C that will conform with ANSI C12.1

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
- Need for ANSI Testing in the shadow of a UL Standard
- UL part of new meter certification process
- UL part of new component selection and design changes

Challenges

Issues

Pro's and Con's of a UL Mark on Electric Meters

Pro's

- Greater perception of safety by the general public
- Outside inspection to maintain certification
- All changes to meter construction are monitored and approved by an outside group

Pro's and Con's of a UL Mark on Electric Meters

Con's

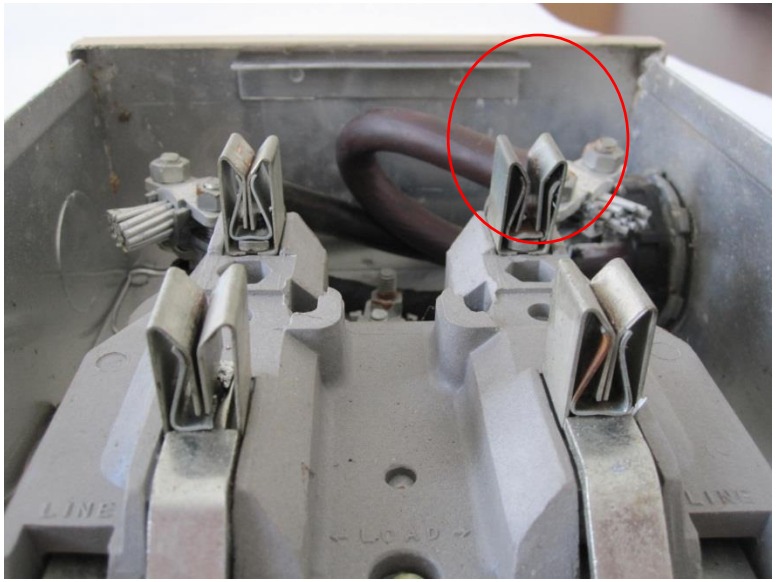
- Greater cost to Utility and Utility customers
- Slower innovation for meters
- Potential for short term meter shortages after implementation
- Potential for fewer meter vendors and options for Utilities

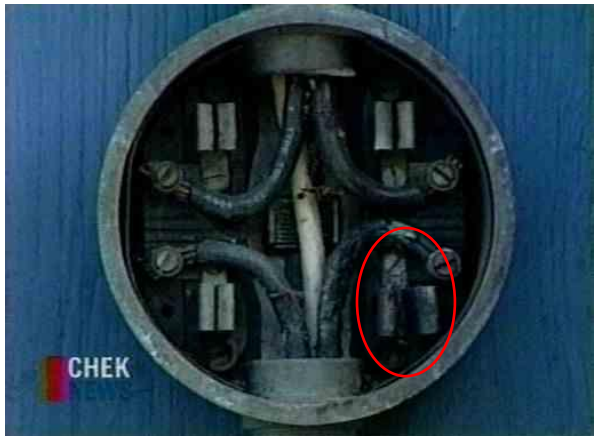
Use of UL as an Independent Test Lab

Current involvement of UL in the metering space

- Independent Test Lab to run ANSI tests
- Independent Test Lab to run customer specific tests
- Independent Test Lab to recommend and run safety tests on any metering product

Searching for Hot Sockets - Common Features and Common Sources of Concern





- Hot Sockets are just that – hot sockets and not hot meters
- Some meters handle hot socket situations better than others

Physical Symptoms

- Pitted and discolored meter blades
- Melted plastic around one or more of the meter stabs (typically the plastic around one stab is where the deformation starts)
- Pitted and discolored socket jaws
- Loss of spring tension in the socket jaws

Field Inspection of Sockets Best Practices

- **Example field check list**
  - Gaps in meter socket jaws
  - Discoloration of one jaw vs. the other three
  - Signs of melted or deformed plastic on meter base
  - Pitting of either meter blade or socket jaw
  - Loss of tension in meter socket jaws
  - Check condition of wire insulation and connections to meter jaws
  - Check the overall condition of the box, socket, meter and how they attach to each other and the building.
  - Look for signs of tampering
  - Look for signs of water or debris inside of the meter can

HIGH BILLS

- Bill increases after a meter installation is always perceived as a new meter issue – this has always been true.
- Public is now more aware that a new meter is going on their house and any increase in their bill is immediately linked to the new meter and not to a change in usage.

High Bills – what are the causes

Most Common

- Bad final read. This happens on a regular basis but is easily mitigated by taking a picture of the meter prior to removal so there is an indisputable record of the final read
- User pays attention to their bill for the first time in months or more typically years and do not recall their increased usage over that time frame
  - Beer fridge or meat freezer on their way out increase usage
  - New pool or expanded HVAC
  - Kids growing up

Less Common

- Old meter really was slow
- Previous owner had been stealing energy by compromising the old meter

Privacy Issue–Big Brother is Watching Me

The utility knows everything I am doing

Current involvement of UL in the metering space

- The utility will know everything I am doing
- My every move can be tracked
- I will never have any privacy again

PRIVACY ISSUES – REAL OR IMAGINED

Discussion Points

- The information available from the internet is far more of a privacy invasion
- The phone utility knows who you are talking to
- The electric utility only knows how much energy you are using
  - Electric utilities are starting to gain the ability to understand the energy signature of various appliances in the home and can use this information to alert the consumer to changes in usage or failing equipment
  - Under no scenario does the electric utility know what is happening inside the house or even who is inside the house. The cell phone companies know this, and internet providers may know this, but electric utilities do not.

What are the Pro's of AMI?

"But Why are you putting these new meters in? My old meter was just fine…."

The Discussion Points are ironically the same ones plus a trump card – Improved Reliability

- Privacy - No one needs to come to their home to read the meter any more. This gives the rate payer more privacy and less intrusions into their life.
- Safety – the new meters have sensors embedded in them to help detect if there is an electrical issue or if there is are elevated temperatures that could lead to a fire. There is also a disconnect that can be used to shut off power (grossly elevated temperature or a wild fire situation)

What are the Pro's of AMI?

- Cost reduction – No one needs to read the meter reducing costs. The meters firmware can be updated remotely and even rates can be changed remotely.
- Health – Nope, we got nothin' here. We do not affect your health other than we can provide more reliable power and peace of mind.

Most Important Pro of them all - Reliability

Trump Card – Reliability

- Reliability – Meters can help the consumer to understand when appliances are failing or are just inefficient. More importantly using AMI data utilities can understand issues in the distribution system. Voltage issues, under sized conductors, loose connections, theft and these are just the tip of the iceberg. A smart meter is the heart of a smart grid. With energy usage increasing significantly (had plateaued starting in 2005) we are lagging in our ability to build new generation, but with smart meters we can now have a smarter grid and use the energy we have more effectively.

Review of Session Objectives

- Understand Customer concerns about Smart Meters and AMI
- Be able to respond as a Utility and as a Utility Worker
  - Health – only improved peace of mind
  - Safety - improved
  - High Bills/Cost reduction & savings
  - Privacy – increased & not reduced
  - Improved RELIABILITY

Questions and Discussion

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