FPSC Joint IOU Presentation

Smart Meter Workshop

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Paul Talley, Gulf Power Company
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The Evolution of Metering

The electric meter is the most improved upon device in the utility industry and continues to change as new technologies are discovered.

- **< 1880s**: Copper plates were submerged in an electrolytic solution and then weighed.
- **1880s**: Discovery that two out of phase AC fields can make a solid armature rotate. (electro mechanical meter)
- **1930s**: First socket type meters
- **1940s**: Introduction of magnetic levitating bearings
- **1970s**: First electronic registers

Progression of telephone communication over the same time period...
The Evolution of Metering

1970s
• Electromechanical induction disk
• Manual meter reading recorded on paper or computer cards
• Monthly reading only (kWh)

1980s
• Electromechanical induction meter with embedded 1-way 900 MHz radio
• Walk-by meter reading using hand-held device
• Monthly reading only (kWh)

1990s
• Electronic digital meter with integrated 1-way 900 MHz radio
• Drive-by meter reading using mobile collector
• Monthly reading only (kWh)
The Evolution of Metering

2000s

• Electronic digital meter with integrated 2-way 900 MHz radio
• Meter communication through a fixed communications network
• Daily, time-interval, and on-demand remote meter readings (kWh)
• Outage and restoration notification

Each day, roughly 500,000 Americans spend at least two hours without electricity in their homes and businesses. Such outages cost our economy at least $150 billion a year. (via Bob Galvin, galvinpower.org)

• Monitor power quality
  • Identify bad transformers
  • Customer voltage problems
  • Service phase identification

Advanced Metering Infrastructure (AMI)

kWh Metering Plus Much More

kWh  kW  Voltage  KVAR  TOU  Current
The Benefits of Advanced Metering Infrastructure

The Customer Will Have:
- Mobile App
- Web Portal
- Detailed Billing

Control
- Save Money
- Conserve Energy

Insight
- Time-of-Use
- Demand Side Management
- Pre-paid

Choices

Smart Meters
- Convenience of Remote Meter Reading
- Reduced Electric Theft, (a cost borne by all customers)
- Reduced Estimated Bills
- Distributed Energy Rates
- Potential Rate Offerings
- Etc…

Our Customers Say:
- Simple Solutions
- More Information (Energy usage and Conservation)
- One size does not fit all
- Expect technology solutions from us

Save Money
Conserve Energy
AMI meters are essential to improving the long-term reliability and efficiency of the electric grid.

- Faster, more accurate outage identification enables faster restoration
- Improved data for engineering and System Planning
- Improved ability to prevent outages through better detection and more predictive maintenance
- Confirmation of restoration without customer intervention
- Greater operational efficiencies, which help utilities control costs
- Improved delivery of energy, enabling transportation cost savings and reduced environmental footprint
Smart Grid

- **Advanced Generation**
  - Excess Generation Storage
  - Distributed Generation

- **Distribution Automation**
  - Integration of Renewables
  - Instantaneous Distribution Power Flows
  - Capacitor Bank Control
  - Outage Detection

- **Advanced Metering Infrastructure**
  - Smart Meter
  - Communication Network
Public Concerns

Privacy

• In the information age, utilities will have an increasing amount of sensitive information that will need protection.

• Each utility continues to take responsibility to ensure the protection of its customers’ private information just as it has in the past.

RF Emissions

• Radio Frequency (RF) emissions are regulated by the Federal Communications Commission.

• Each utility continues to follow the FCC regulations and other industry standards to protect its customers and employees from RF emissions.
Nothing has changed…except the way the meter is read
• We are still dedicated to protecting customer information
• No customer information is stored at or transmitted from the meter
• Total energy consumption is all that is measured
Customer Web Portal – Daily Use

Example

CUSTOMIZED MONTHLY GRAPH VIEW - Bill Cycle: May 12 - June 15, 2011

Enables you to view a customized and detailed breakdown of current and past energy usage. Click on any day in the graph for an hourly breakdown and possible causes and solutions for abnormally high usage.

SUMMARY OF ALERTS
- Pending Rate Change (June 2011)
- Reminder: Change your air filter
- Tip: Remember to set your thermostat to 78°
- Sign up for custom alerts to help manage your energy usage

ABOUT THIS BILL
- Bill Amount: $283.68
- Due Date: July 11, 2011
- # of days in billing cycle: 35
- Average daily usage: 8.85
- Pay this bill now
- Easy ways to lower your bill
- Rate plans and options that fit your lifestyle

MY GOAL TRACKER
- Status as of July 15, 2011
- Actual
- In Progress
- Today’s Goal
- Visit Goal Tracker
Customer Web Portal – Hourly Use
RF Exposure

- Smart Meters have been tested & certified to FCC rules
- Smart Meter power is ≤ 1 Watt
- Duty Cycle < 10% (typically < 1%)
- 900MHz Public Exposure Limit is 610uW/cm²
  - 10x safety factor for occupational exposure
  - An additional 5x safety factor for general public exposure
  - So, there is a 50x FCC safety barrier for public exposure
- Peak measured levels at 1 foot are below this limit
- Typical indoor peak exposure < 1uW/cm²

* Matt Butcher

sitesafe
rf compliance experts

FPL
Progress Energy
Comparison of RF Density in Everyday Environment

*Richard Tell and Associates*
Progression

• Advances in technology have influenced electric metering over the last century and Smart meters are the result of that continuing development

• Smart meters allow utilities to provide many benefits to their customers

• Smart meters are fundamental in the foundation for a smart grid

• Utilities recognize the concerns of their customers and are diligent in making sure their grid enhancements comply with all established federal safety regulations and protect customer data