

LPEA Advanced Metering Infrastructure (AMI)

LPEA'S NEW METERING SYSTEM AND COMMON QUESTIONS

Outline

- **LPEA's new metering system**
 - What it is
 - The benefits
 - How it works
- **Common questions**
 - Privacy
 - Security
 - Radio frequency
 - Accuracy
 - Cost analysis
 - Opt-out

Metering at LPEA

- Metering is needed for proper billing
- Metering is also needed for proper system operation
- Prior to 2000
 - Meters read by hand once a month
- Beginning in 2000
 - LPEA deployed Automatic Meter Reading (AMR) system to bring back daily reads over power line
- Beginning in 2012
 - LPEA will be upgrading to AMI



What is AMI?

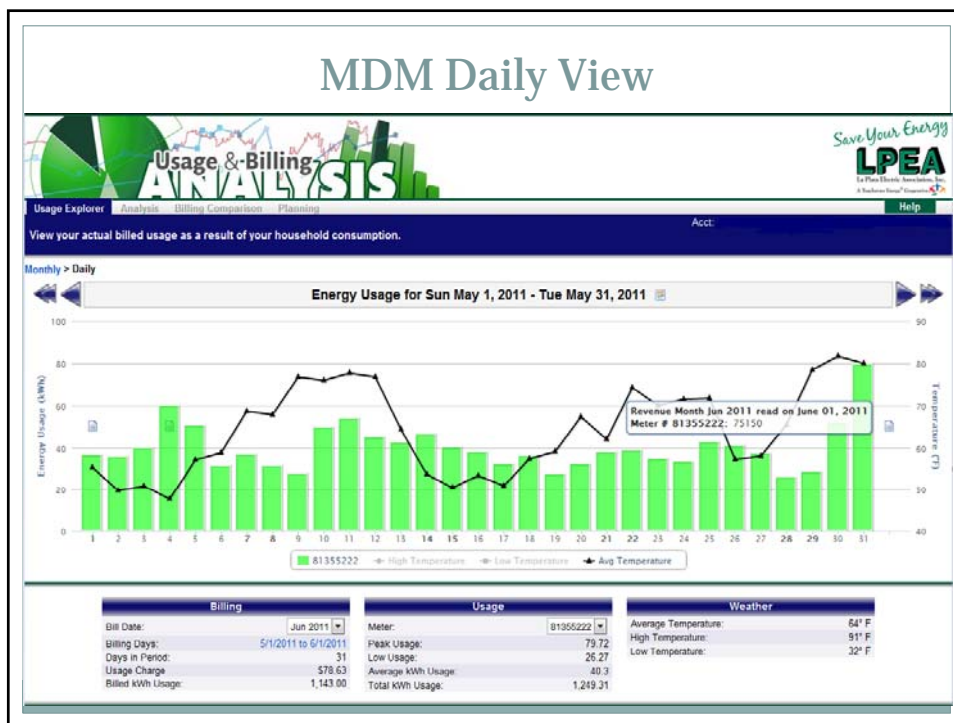
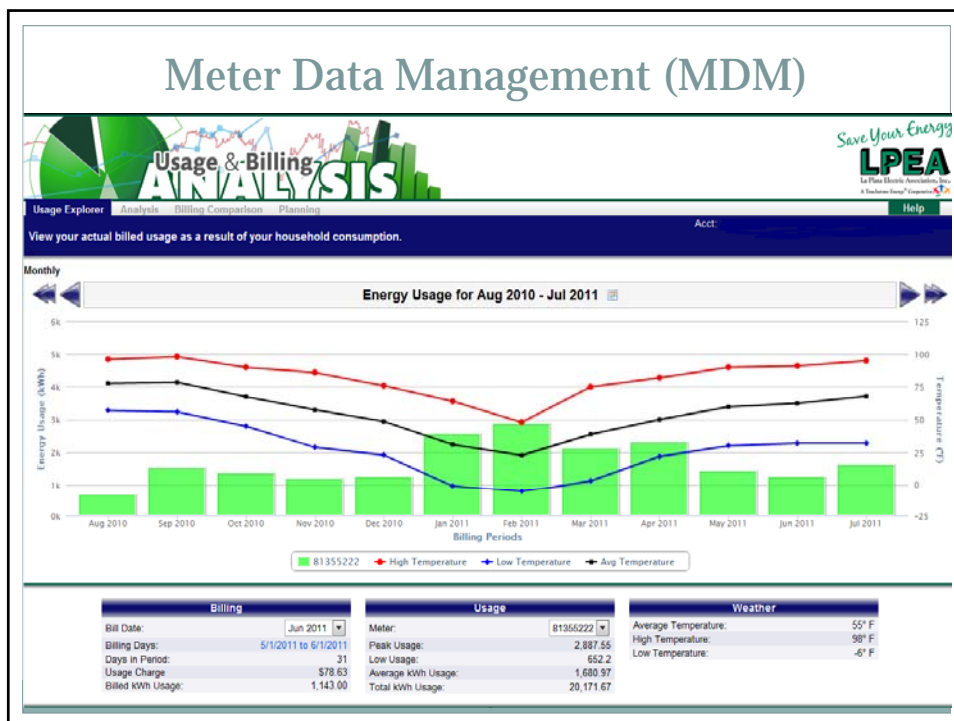
- Advanced Metering Infrastructure
- Standard meter with a communications module added
- Overlays the grid with a two-way communications system
- Capable of communicating to more than just meters
 - Switches
 - Reclosers
 - Fault detectors
 - Current and voltage sensors

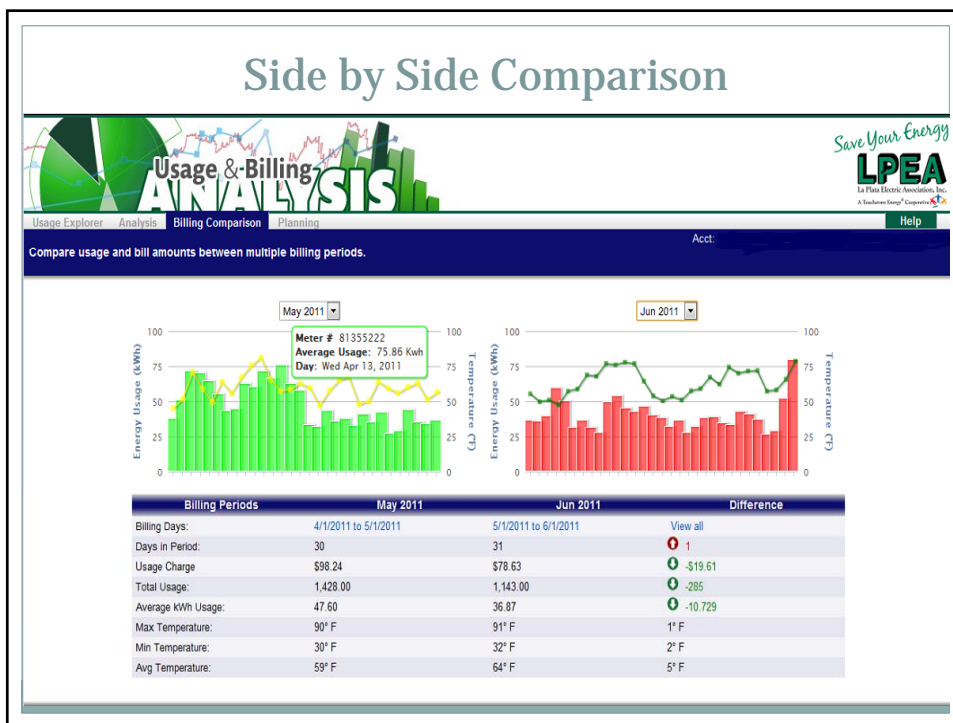
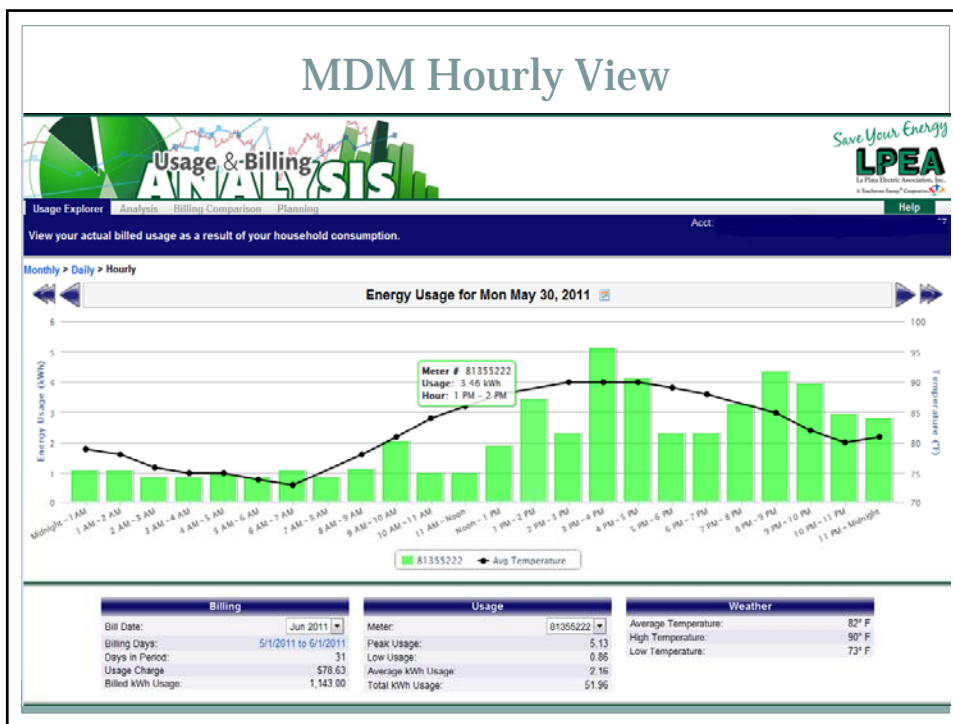
Why is LPEA Changing to AMI?

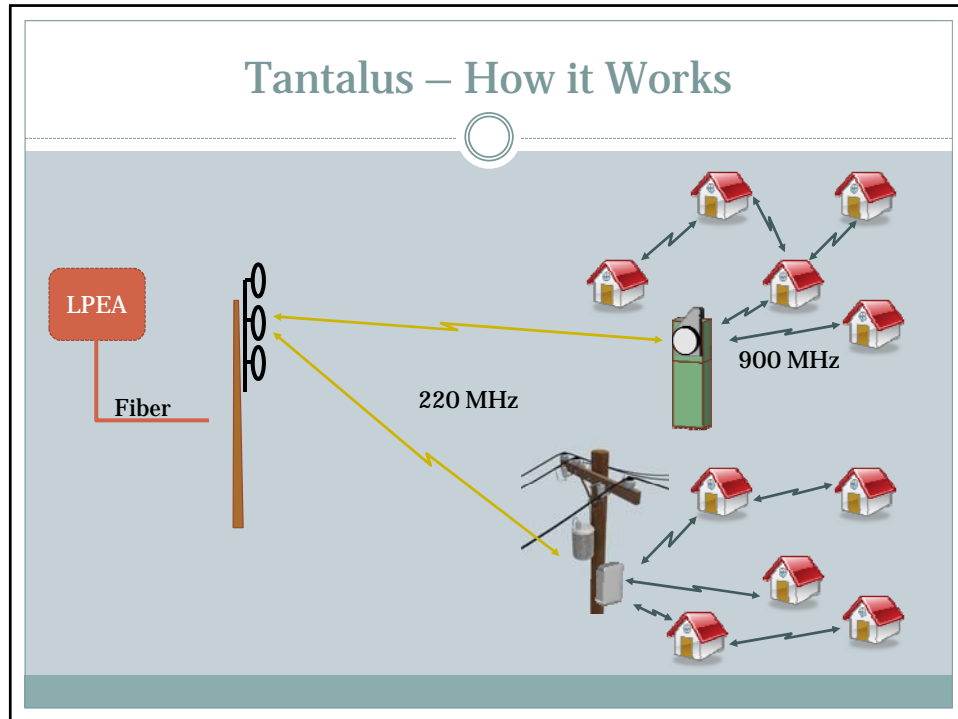
- **Added value for LPEA and its members**
- **Cost savings**
- **AMR is reaching end of life**
 - Replacement parts are no longer available
 - Support is becoming more difficult to acquire
 - Performance is declining in some areas
- **Power system is requiring more detailed information to operate**
 - Varying generation from renewables
 - Optional programs to smooth load curves

What benefits will the AMI system provide?

- **A valuable tool for members to understand and analyze their usage**
- **A valuable tool for LPEA customer service reps**
- **Ability to reprogram meters remotely**
- **Optional load control solutions**
- **Remote disconnects/reconnects**
- **Pre-pay**
- **Pinpoint outages and track service restoration**
- **Voltage alarms**



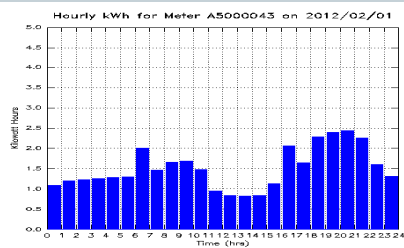
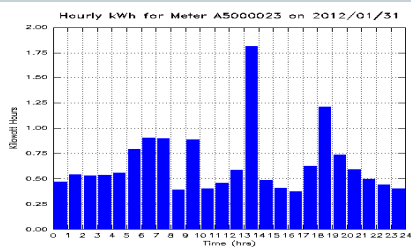
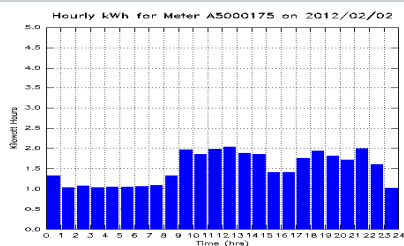
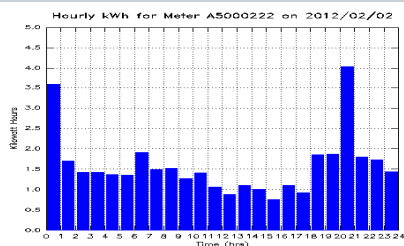




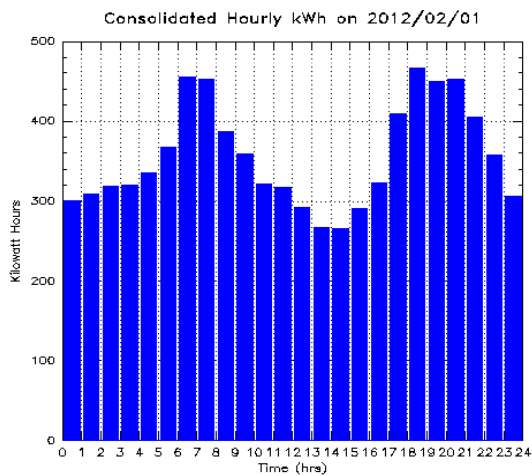
Privacy

- LPEA considers privacy and security a top priority
- LPEA treats each member's personal information and data as confidential
- Personal information will not be connected to usage data if released to any third parties
- Individual usage data means little without the knowledge of what was turned on or off
 - Usage for individual loads and appliances is not known

Name That Load Profile



300 Meters Combined

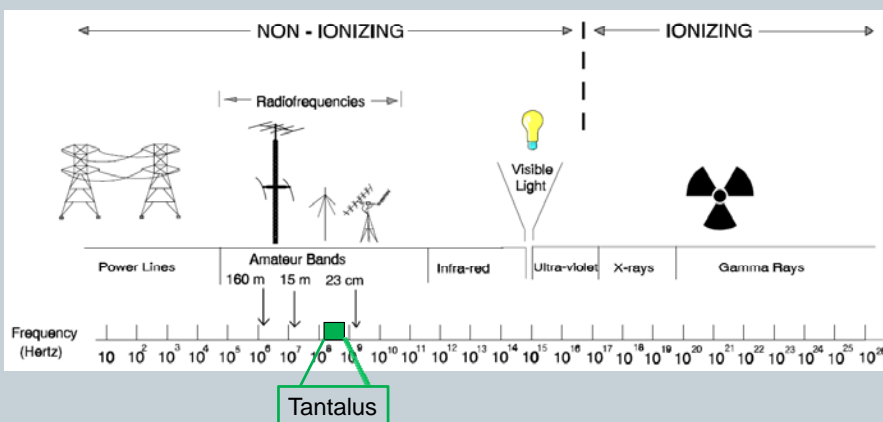


Security

- Measures taken at the office and in the field
- Near military grade encoding scheme
 - Top of class AES 256 and RSA 1024 data encryption
 - New credentials (passwords) are established on every transmittal
- Layers upon layers of security
- All devices connected to the system be certified
- Meets or exceeds NIST IR 7628 security recommendations



Electromagnetic Spectrum



Supplement B to FCC OET Bulletin 65

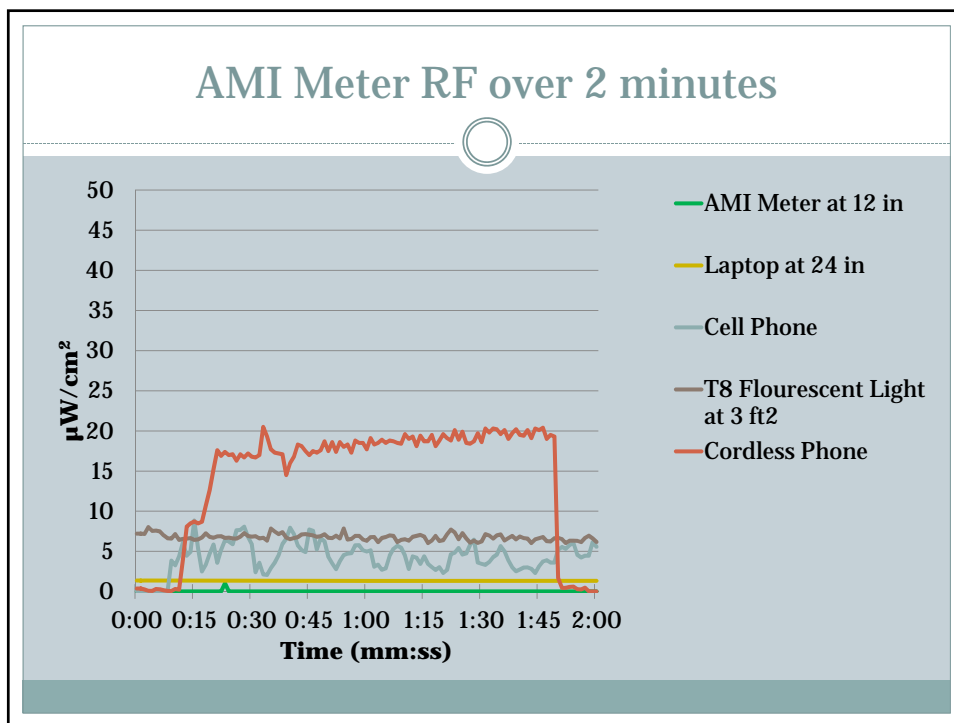
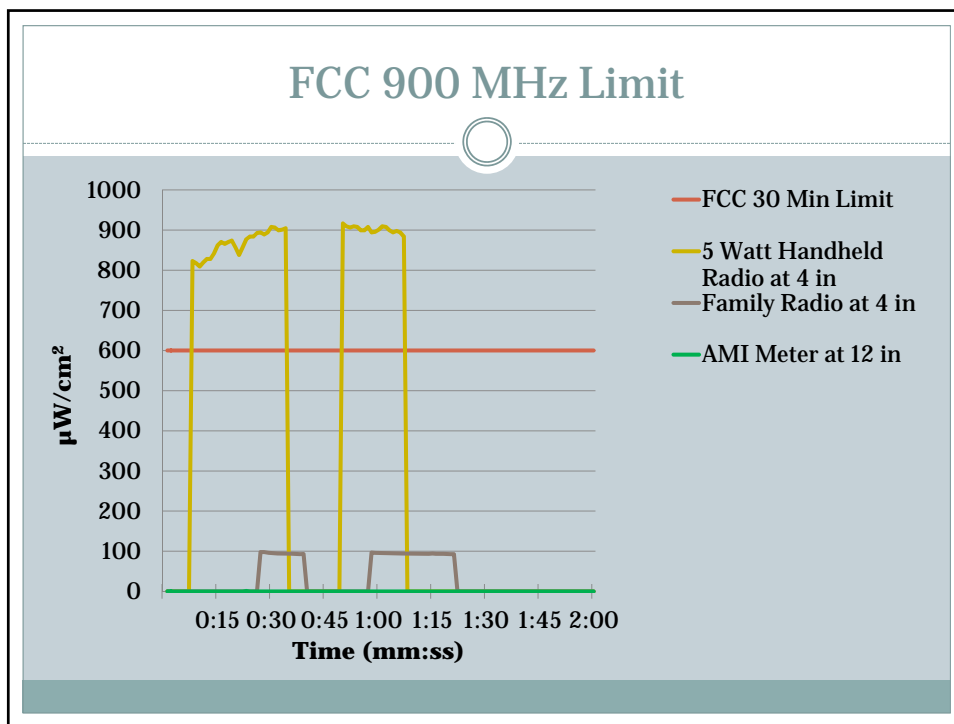
RF Exposure Standards

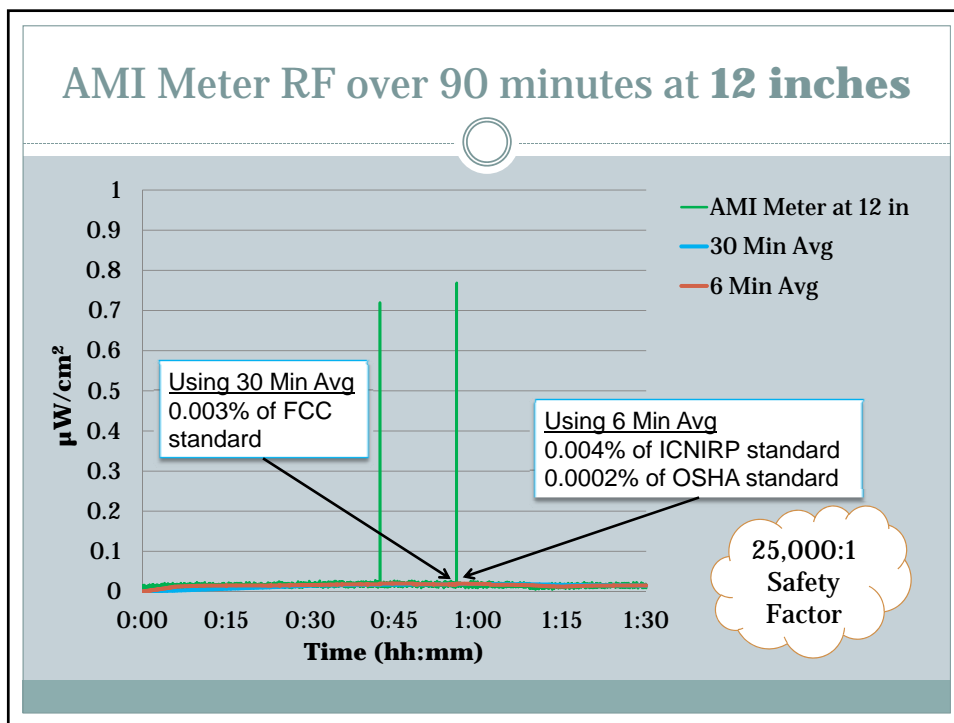
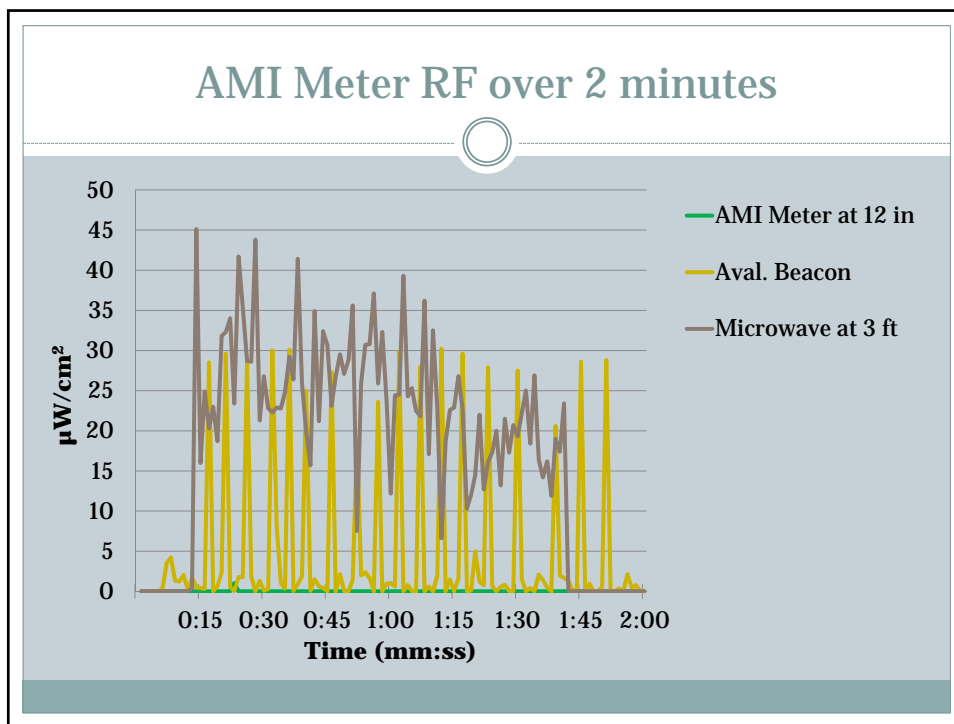
- **FCC; OET Bulletin 65 (1997)**
 - Performed in conjunction with IEEE, NCRP, and EPA
 - Limits average 220 MHz exposure over 30 min to 200 $\mu\text{W}/\text{cm}^2$
 - Limits average 900 MHz exposure over 30 min to 600 $\mu\text{W}/\text{cm}^2$
- **International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guideline**
 - Limits average 220 MHz exposure over 6 min to 200 $\mu\text{W}/\text{cm}^2$
 - Limits average 900 MHz exposure over 6 min to 450 $\mu\text{W}/\text{cm}^2$
- **Occupational Safety & Health Administration (OSHA); 1910.97**
 - Limits average exposure over 6 min to 10,000 $\mu\text{W}/\text{cm}^2$

The Tantalus System

- **One reason for selecting Tantalus was because of their small radio frequency footprint relative to other AMI systems**

Vendor	Meter	Collector
Tantalus	½ watt	5 watts
Silver Springs	1 watt	7 watts / cellular
Sensus	5 watts	None

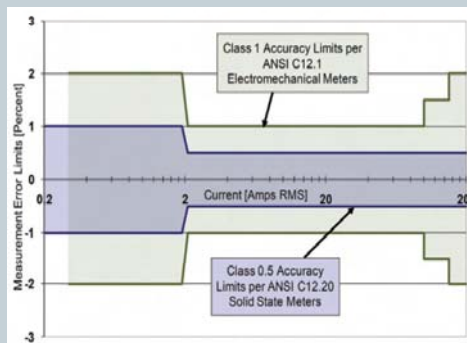




Accuracy

- **Members could see their bills increase if:**

- They were previously stealing power
- Previous meter was running slow
- Timing of meter exchange causes increased number of days on first bill



- **Tantalus meter reads have been field verified**

System Costs

Item	Cost
Master Station (Hardware and Software)	\$100,000
Network Controllers	\$400,000
Field Hardware (Meters, Modules, Collectors)	\$6,900,000
Installation (Modules and Antennas)	\$800,000
Total Capital Cost	\$8,200,000

- **Annual owning cost is \$900,000**
 - Includes depreciation, interest and taxes
- \$200,000 per year to operate and maintain
- Total annual costs..... **\$1.1 million / year**

System Benefits

Item	Cost
Avoided meter reading expense	\$700,000
Avoided cost to support and maintain Ampy Prepay	\$50,000
Increased revenue from accuracy improvement	\$250,000
75% reduction in collections (labor and mileage)	\$330,000
Avoided cost of reprogramming TOU meters (once every 5 yr)	\$20,000
Total Annual Cost Benefit	\$1,350,000

- Total savings **\$250,000 per year**

Opt-out Program

- Members will be allowed to opt-out of LPEA's AMI metering
- If member wants the benefits of the AMI (no meter reader on property, automatic outage notification, tools for usage analysis, etc.), but has concerns on RF, they can be placed on the "no collector" list at no charge
- If a member wants nothing to do with AMI meter, they can be placed on the "no meter" list
 - There may be a monthly charge
 - Details coming after May Board meeting

Deployment Plan

- **Beginning October 2012**
 - Install 10,000 meters in vicinity of Smelter Mountain
 - Install antennas east of Hesperus, at Trimble Substation, at Purgatory Substation, and at Grassy Mountain
- **2013**
 - Meters to remainder of La Plata County; begin Archuleta
 - Install antennas at Oak Brush, Arboles, and Chromo Mountain
- **2014**
 - Meters to remainder of Archuleta County

THANK YOU

QUESTIONS?