

VISION

STRATEGY

REALITY

Beyond deployment

+ SMART METER MAINTENANCE, REPAIR AND REPLACEMENT

By William Atkinson

→ THERE IS A LOT OF EMPHASIS BEING PLACED ON THE ROLL-OUT AND installation of smart meters for utilities and their customers. However, with all of the focus on the initial issues, it's important not to lose sight of issues that can and will arise further down the road—specifically the maintenance, repair and eventual replacement strategies for the meters. While full-scale replacement may not occur for several years, maintenance issues can occur almost immediately.

For some utilities, the primary focus remains with the installation. Until that is complete, they prefer to hold off on creating their maintenance, repair and replacement strategies. One such utility is Salt River Project (SRP). SRP began installing smart meters in 2005. Currently, the 930,000-customer utility has about 317,000 meters installed. "Our plans are to continue until we reach full deployment in 2014," said John Gomez, supervisor of metering and customer services. Currently, according to Gomez, maintenance, repair and replacement are handled informally and on an as-needed basis. "Our system will monitor whether or not we are getting a read on each meter," he said. "If not, we will visit the site. At this point, though, we are still evaluating formal maintenance and replacement programs. We have nothing in place at this time."

MAINTENANCE AND REPAIR STRATEGIES

One utility with a comprehensive maintenance and repair program is Pacific Gas & Electric (PG&E). "During deployment, we have a certain number of meters that fail immediately, due to production problems," said Bob Craig, supervising engineer, SmartMeter operations. "We also have various methods to detect whether the modules are working or not after the meters are installed." If there is a problem, someone will be sent out to service it. PG&E also has proactive programs, such as battery replacement.

San Diego Gas & Electric (SDG&E) also has a formal approach to asset management and maintenance, including its smart meters. "All of the assets in the smart meter business have various design lives," said Ted Reguly, director, smart meter program office. There is a 15-year life on electric meters and gas modules, 34 years for gas meters and five years for IT equipment. "We will be monitoring key performance indicators to manage these assets," he said. SDG&E has a five-year warranty with the manufacturer of its meters, with options to extend the warranty. "We will work with the manufacturer on any returned product failure analysis to determine whether repair or replacement is appropriate," said Reguly.

The smart meters that Southern California Edison (SCE) will be rolling out in 2009 will be covered by a one-year warranty. "If there are failures within the first year, they will be sent back and replaced with new products, rather than being repaired," reported Paul De Martini, vice president, "SmartConnect" program. "However, we aren't anticipating a lot of failures—maybe one-half of one percent."

With the way smart meter technology works, of course, SCE won't know about failures until they happen. However, this may be a more proactive approach than the old approach where potential problems might be spotted by a meter reader in the field (such as seeing a roof gutter, tree limb or other heavy object ready to drop onto a meter). The reason, according to De Martini, is that, while meter readers only visit each meter once a month, SCE's system will read meters daily. "As such, we will know every day if there is a problem," he said.

SYSTEM MAINTENANCE

SCE utilizes SAP asset management modules to track its assets with meters being one of the major assets. "We also track all of the components in the meters, so we have traceability if there is a problem," said De Martini. That is, SCE knows which production lot each component is associated with and which components came from which upstream suppliers. "For example, if a capacitor fails, we know all of the other meters in the system that use that same capacitor from that same production batch," said De Martini. "This allows us to do root cause analysis a lot faster."

In terms of its system maintenance, PG&E is installing a network to read the meters. These are typically pole-top devices with batteries. "As such, we have battery maintenance issues with these units, just as we do with the meters," said Craig. "We are a little more aggressive on these—about a five-year replacement."

As often as possible, PG&E likes to have a three-to-one ratio, in that every end point (e.g., operating smart meter) should be "talking" to three pole-top devices. This redundancy ensures that at least one "read" will get through. It also provides a huge increase in data integrity, according to Craig.

Another consideration on the pole-top network devices: A car-pole

accident that takes out a distribution line could also take out the meter reading system. “We are training our people such that, when they are responding to this type of accident, they don’t forget about potential damage to the meter reading system,” said Craig.

REPLACEMENT STRATEGIES

While smart meters may not need a lot of maintenance and repair, other than dealing with a small percentage of meters that fail right away and then subsequently monitoring battery life, there is another issue to consider—replacement cycles. How often should smart meters be replaced systemwide?

When computers gained popularity in the 1980s, they had the capability of lasting several years, and this continues to be the case today. However, it wasn’t long before users began replacing their computers every couple of years, as new advancements in technology made newer models significantly more appealing.

Will the same thing happen with smart meters? It is unlikely. While most smart meters have a possible life of 20 years, and change-out may become appealing for technology reasons after five to seven years, most experts believe that utilities will more than likely replace meters every 10 to 15 years, taking advantage of new technologies at that time.

With the technology that exists today, Mario Natividad, president of Applied Metering Technologies, doesn’t think there is a lot that can be added in the near future that would cause utilities to want to upgrade to newer technologies. “Most

of the important features are already in place, such as remote disconnect and outage detection,” he said. “In addition, if there are some new technologies, many of these may be able to be added by software upgrades to the whole system rather than replacing the meters themselves.”

After 15 years, though, Natividad believes that utilities will want to look at replacing their meters, at that point taking advantage of new features that might be available at the time.

PG&E has thought about long-term replacement strategies, especially on the gas side. “Gas meters have 20-year batteries,” said Craig. “We haven’t been through 20 years to see if they will last this long. However, our current plan is to do a proactive 15-year replacement. At that time, if a better technology exists, we may upgrade to the new technology, rather than just replacing the batteries on the existing modules.”

SDG&E has also thought about this. “We have selected a very flexible technology solution,” said Reguly. “However, we are constantly monitoring the marketplace and looking at major technology advancements. If the benefits were to outweigh the costs, we would change course in order to deliver the best service to our customers and operations.”

Rather than the way people replace computers with the newest models every year or two, SCE’s De Martini believes meter replacement cycles will be more like those with major home appliances. “Homeowners usually only replace these every seven to 10 years, so manufacturers have aligned their product development cycles to these cycle times,” he concluded.

William Atkinson is a freelance writer based in Illinois.



Smarter ways to manage risk

+ **INTELLIGENT VIEWPOINTS**
By Mary Ann Stewart

RISK MANAGEMENT

In this article, Mary Ann Stewart walks through efforts that may not scream “smart grid,” but do build a smarter grid and more intelligent utility. Louis Rana of Con Edison focuses on the vision and strategy and Don Cortez focuses on the reality of risk management.

PLANNING FOR THE UNTHINKABLE

➔ **WE ARE INTRODUCING A REGULAR COLUMN FOCUSED ON THE INSIGHTS** of utility leaders regarding the development of technology to serve the emerging intelligent utility. In this issue, Louis Rana discusses the adoption of incremental technology innovations that are helping Con Edison minimize risk to the grid as well as to its customers. Don Cortez reflects on CenterPoint Energy’s recent experience restoring power after Hurricane Ike and how this has increased his advocacy for the development of smart grid capabilities.

Louis Rana is president and chief operating officer of Con Edison, which provides electric, gas and steam service to New York City and most of Westchester County. Given the history and current stresses involved in providing power to this service area,