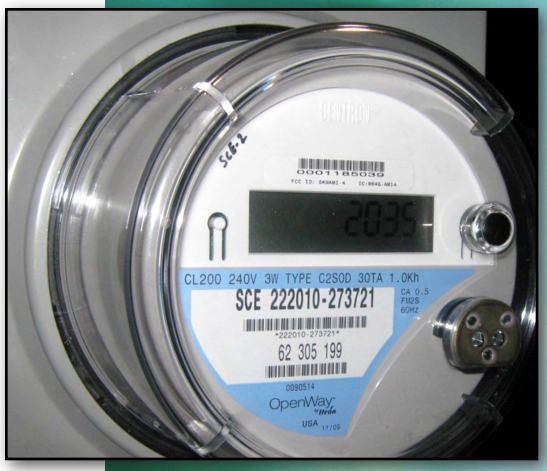
EPRI Research Shows that Radio Frequency Emissions from Itron Smart Meters Are Below Human Exposure Limits



The Itron Smart Meter has been widely installed in southern California

In response to a directive from the California Public Utilities Commission (CPUC), Southern California Edison (SCE) and San Diego Gas & Electric Company (SDG&E) began deploying smart meters to customers in 2009. Over the next year, both companies received inquiries from customers and other stakeholders about whether the radio frequency (RF) fields emitted by the smart meters posed a human health risk. SCE contacted EPRI in late 2009 about conducting a study characterizing and measuring the RF field exposures from the Itron smart meter that the company was in the process of rolling out to its customers. SDG&E was also installing Itron smart meters and jointly participated in the study with SCE. The two companies were closely involved in designing and implementing the study, which involved collecting data and working with the smart meter manufacturer, as well as taking field measurements in neighborhoods in southern California where the Itron smart meters were already installed. This first-of-its-kind detailed evaluation of the RF fields emitted from the Itron smart meters showed that typical exposures are very low and fall well below scientifically-based human exposure limits.

Smart Meter Deployment in Southern California Raises Questions and Concerns about Possible Risks to Human Health

Smart meters are one component of a modern, advanced metering infrastructure designed to streamline communication between electricity providers and end users. In 2007, the CPUC issued a directive to electric power companies in the state to submit plans for deploying automated metering infrastructure—including smart meters—in their service territories. Many of these technologies emit RF fields, and because the technologies were relatively new, potential human exposure patterns from this technology had not been fully characterized.

Shortly after SCE and SDG&E began deploying smart meters in southern California, the companies received questions and addressed concerns from customers, regulatory and public agencies, and others about the safety of the devices. Both companies had been working with the manufacturer to gather information about RF emissions from smart meters. SCE also began measuring smart meter RF emissions to determine RF exposure levels associated with the meters. With public concern continuing to grow, however, the company asked EPRI to conduct a scientific, third-party evaluation of the RF emissions from its smart meters. SCE and SDG&E were using smart meters manufactured by Itron Inc., and SDG&E decided to participate in the study jointly with SCE. According to Jim Turman, Safety Services Project Manager at SDG&E, "We saw the need for providing a strong analysis of how smart meters work, and what kinds of exposures they have. We were aware of EPRI's commitment to this issue and we had a lot of confidence in their scientists." SCE and SDG&E worked closely with EPRI to design the study protocol, and EPRI also engaged one of the world's foremost RF authorities to be part of the research team to conduct the exposure characterizations called for in the study.

Challenge

Southern California Edison (SCE) and San Diego Gas & Electric (SDGE) sought independent scientific data to address public concerns about the safety of RF fields from smart meters.

Solution

EPRI, in collaboration with SCE and SDG&E, conducted a first-of-its-kind RF exposure measurement project characterizing RF emissions from the Itron smart meter.

Results and Benefits

The research showed that RF fields emitted by smart meters are well below the human exposure limits set by the Federal Communications Commission.

The two companies use the study results to communicate with customers, the public, regulatory agencies and the scientific community.

The research was published in a scientific journal and cited in a California Council on Science and Technology report assessing the health impacts of RF exposure from smart meters.

Study Shows Smart Meter RF Emissions Significantly Below Human Health Exposure Limits

The smart meters examined in the study are part of wireless mesh networks in which one meter is configured as a collector point (or cell relay) for each of approximately 500-750 end point meters. The cell relay collects data from the end point meters and conveys these data onto the cellular wireless wide area network for communication back to the electric power company's data management system. Measurements were conducted in both laboratory and residential settings with single and multiple smart meters, with the overall objective of determining realistic estimates of exposure levels and the operational duty cycle (the percent of a given period of time that the meter is transmitting). SCE and SDG&E also worked closely with Itron to characterize actual duty cycles by analyzing data captured by the mesh network software. The study results indicated that regardless of duty cycle values for end point and cell relay meters, typical exposures from smart meters were very low and hence comply with scientifically-based human exposure limits for RF fields set by the Federal Communications Commission and supported by other independent scientific organizations.

"Working with the EPRI team was a great experience, and renewed our confidence that EPRI knows where to go to get answers."

~ Jim Turman
San Diego Gas & Electric Company

Once the study was completed, the research results were widely disseminated. SCE and SDG&E added information to their websites to answer questions and address public concerns. The companies also communicated the research results to other stakeholders. "We used the information in meetings with city officials and customers. For people interested in seeing the science, we were able to answer their questions and show them the numbers," says Glenn Sias, Manager of the EMF and Energy Group at SCE. In addition, the research results were reviewed, considered and referenced by the CPUC when addressing cases and claims related to RF exposures from smart meters, and by the California Council on Science and Technology report in preparing a report on smart meter exposures in California. Full results of the study were published in detail as an EPRI report which is publicly available on EPRI's website. The summary of the results has also been published in the peer-reviewed scientific literature.

SCE and SDG&E are recipients of an EPRI 2011 Technology Transfer Award recognizing their leadership and innovation in helping to design and conduct the smart meter study. SCE in particular committed resources to working with Itron to secure the manufacture's participation, arranging for two days of surveys at homes in California, and gathering 90 days of transmission data for 86,000 meters. According to EPRI Program Manager Gabor Mezei, "One of the big questions was determining what percentage of the time smart meters were transmitting. Both participating companies provided a tremendous amount of data that helped us determine that most meters transmit less than one percent of the time." "EPRI has a lot of credibility and they've done a great job in maintaining the integrity of the RF program and producing quality research that is respected by the industry, scientists and independent researchers," says Sias of SCE. SCE and SDG&E believe that the value of this project lies in the close collaboration between their companies, EPRI researchers, world class experts and the manufacturer, and also believe this research will benefit the public the as well as electric power industry. Notes Turman of SDG&E, "Collaboration and teamwork is the most important part of this. We all benefit from making something that can help the industry move forward. This isn't the stopping point. We'll be looking at more infrastructure that may rely on RF."

Related EPRI Products

Title	Product ID
"An Investigation of Radiofrequency Fields Associated with the Itron Smart Meter" (2010)	1021126
"Radiofrequency Fields Associated with the Itron Smart Meter," Radiation Protection Dosimetry (2012)	E236400
"EPRI Comments: A Perspective on Two Smart Meter Memoranda," (2012)	1024952
"Characterization of Radio Frequency Emissions From Two Models of Wireless Smart Meters" (2011)	1021829

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com)

CONTACTS

Gabor Mezei, *Program Manager*
650.855.8908, gmezei@epri.com

1025081 April 2013

Electric Power Research Institute
3420 Hillview Avenue, Palo Alto, California 94304-1338 • PO Box 10412, Palo Alto, California 94303-0813 USA
800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com