

Studies Regarding Health Effects of Smart Meters

Introduction

KUB's Grid Modernization initiative involves the deployment of advanced meters (sometimes referred to as "smart meters") that are equipped with communication devices. These devices periodically send radio signals containing utility consumption data to receiving towers that have been strategically located throughout the KUB distribution system.

Today, advanced meters equipped with communication devices have become commonplace. At the end of 2015, over 65 million of these meters had been deployed across the United States, and over 43% of US households currently have one or more of these devices. In light of this trend, most manufacturers have all but ceased production of the old analog meters and are producing only digital meters. When a communication device is added to a digital meter, it becomes an advanced meter.

After completing a successful pilot program in the Fort Sanders area in 2014 and years of research and planning, KUB made the decision to expand the program to install new advanced meters system wide through a four-year project to replace 400,000 electric, natural gas, and water meters starting in summer 2016.

KUB's research of Grid Modernization technology included reviews of studies that had been performed on the safety of advanced meters. One example is the potential health effect of electromagnetic fields (EMF) and radio frequency (RF) found in the wireless networks of "smart grids."

A vast majority of independent studies have concluded that there are no known health effects related to the low levels of RF emissions associated with advanced meters. Based on these studies, we believe that this technology is safe and adds a number of benefits to KUB and to our customers.

The purpose of this report is to discuss the sources of information that KUB has reviewed that led to the conclusion that these devices are safe, and also led to the decision to move forward with our Grid Modernization effort. KUB has always sought to be an honest broker of information for our customers. In this day of unprecedented information availability through the internet, it's even more important for KUB to be a discerning voice of reason to help our customers understand possible competing points of view.

Types of Studies: Avoiding the Perception of Bias

KUB focused on studies in which the researchers could not be perceived of having a bias for or against various types of Grid Modernization technology. For that reason, we did not include research sponsored by the utility industry. In an effort to remove any doubt in this regard, these studies were excluded from consideration. For example, there is no reason to question the excellent research conducted by the Utilities Technology Council (UTC). However, some may raise questions of positive bias since UTC is partially funded by contributions from the utility industry. In an effort to remove any doubt in this regard, these studies were excluded from consideration.

For similar reasons, studies such as the 2012 Bioinitiative Report were also excluded from consideration. Neutral observers have questioned the bias against Grid Modernization technology in the report (<https://www.sciencebasedmedicine.org/picking-cherries-in-science-the-bio-initiative-report/>), and an internet search revealed several other questions about this report.

Instead of considering research that may have included real or perceived biases, KUB relied on studies from highly-respected organizations that were neutral on the issue. The World Health Organization studies were especially valued due to the balanced approach they employed.

World Health Organization (WHO) Studies

The WHO has conducted a number of studies on EMF and RF through the years. The one most applicable to Grid Modernization technology is titled “Electromagnetic Fields and Public Health: Base Stations and Wireless Technologies” and a 4-page summary of this study can be found at the following link: <http://www.who.int/peh-emf/publications/facts/fs304/en/>.

Quoting directly from this report:

“From all evidence accumulated so far, no adverse short- or long-term health effects have been shown to occur from the RF signals produced by base stations. Since wireless networks produce generally lower RF signals than base stations, no adverse health effects are expected from them.”

“Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects.”

This summary was published in May 2006, and also stated that “research is still being promoted by WHO to determine whether there are any health consequences from the higher RF exposures from mobile phones.”

The WHO completed its mobile phone study in 2013 and published a summary of its findings in October 2014. That summary can be found at the following link: <http://www.who.int/mediacentre/factsheets/fs193/en/>

Quoting directly from this report:

“A large number of studies have been performed over the last two decades to assess whether mobile phones pose a potential health risk. To date, no adverse health effects have been established as being caused by mobile phone use.”

“A number of studies have investigated the effects of radiofrequency fields on brain electrical activity, cognitive function, sleep, heart rate and blood pressure in volunteers. To date, research does not suggest any consistent evidence of adverse health effects from exposure to radiofrequency fields at levels below those that cause tissue heating. Further, research has not been able to provide support for a causal relationship between exposure to electromagnetic fields and self-reported symptoms, or “electromagnetic hypersensitivity.”

(Note: the WHO has also performed a study of electromagnetic hypersensitivity, which can be found at this link: <http://www.who.int/peh-emf/publications/facts/fs296/en/>. Among its findings: “Electromagnetic hypersensitivity (EHS) has no clear diagnostic criteria and there is no scientific basis to link EHS symptoms to EMF exposure. Further, EHS is not a medical diagnosis, nor is it clear that it represents a single medical problem.”)

Regarding the long-term effects of mobile phone use, the International Agency for Research on Cancer (IARC), which is affiliated with WHO, performed a study to determine whether there are any links between the use of mobile phones and head and neck cancers in adults. Continuing to quote directly from the October 2014 summary:

“The international pooled analysis of data gathered from 13 participating countries found no increased risk of glioma or meningioma with mobile phone use of more than 10 years. There are some indications of an increased risk of glioma for those who reported the highest 10% of cumulative hours of cell phone use, although there was no consistent trend of increasing risk with greater duration of use. The researchers concluded that biases and errors limit the strength of these conclusions and prevent a causal interpretation.”

“Based largely on these data, IARC has classified radiofrequency electromagnetic fields as possibly carcinogenic to humans (Group 2B), a category used when a causal association is considered credible, but when chance, bias, or confounding cannot be ruled out with reasonable confidence.”

It’s important to note that these findings were associated only with the highest 10% of mobile phone users. The report notes that “the power (and hence the radiofrequency exposure to a user) falls off rapidly with increasing distance from the handset. A person using a mobile phone 30-40 cm (about 12-16 inches) from their body – for example when text messaging, accessing the Internet, or using a “hands free” device – will therefore have a much lower exposure to radiofrequency fields than someone holding the handset against their head.”

Some have attempted to link the WHO Mobile Phone study to the issue of smart meters, claiming that smart meters have the same level of risks to users as mobile phones. In a recent report, the Environmental Defense Fund (EDF) attempted to add some perspective to the issue. Their report can be found at this link: http://www.edf.org/sites/default/files/EDF-smart-grid-benefits-fact-sheet_0.pdf. Quoting directly from the EDF report:

“The WHO report did not explicitly address smart meters; it and the other commonly cited studies focused on cell phones, power transmission lines, microwave ovens, and other emitters of electromagnetic fields (EMFs) at various radio frequencies, including extremely low frequencies (ELFs).”

“Given that smart meters are also RF emitters, some have worried that if cell phones might pose a health risk, smart meters might do so as well. As with cell phones, a person’s exposure depends on the signal strength and distance: a report published by the California Council of Science and Technology (CCST) in 2010 (<http://ccst.us/publications/2011/2011smart-final.pdf>) included findings from the Electric Power Research Institute (EPRI) that a person 10 feet from a smart meter would experience only a small fraction of the RF exposure – 250 to 1,250 times less – than they would be exposed to using a cell phone. So whether or not future studies find the

RFs present more health effects, smart meters make up a very small part of a person's daily exposure.”

Conclusion

The technologies associated with Grid Modernization and advanced meters have been studied extensively over the past several years. Of all the studies conducted by the WHO and its agencies, only one has shown a possible link between RF emissions and human health, and that study was limited to mobile phone usage. As the Environmental Defense Fund points out in its report, there is a significant difference in potential exposure from a mobile phone placed in direct contact with the head and an advanced meter that is placed outside the home. KUB is supportive of continuing research into this field of study. Based on the results to date, however, KUB is comfortable with the opinion of most researchers that advanced meters and Grid Modernization technologies are safe for its customers.