SAGE Associates
ENVIRONMENTAL CONSULTANTS

September 22, 2010

Office of Engineering & Technology
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Attention: Julius Knapp, Chief, OET, FCC
Subject: Smart Meter RF Emissions - Compliance Questions

Dear Mr. Knapp,

Thank you for your response to my letter dated March 15, 2010 in which I raised questions about the validity of compliance testing for smart meters. Your letter raises more questions than it answers.

FCC compliance with existing regulations for uncontrolled public access is not reliably demonstrated. The FCC must take further steps to evaluate whether existing compliance testing and certification of smart meters "in the manner and locations installed" relied on faulty assumptions and information, and are thus unreliable. Timely reassessment is critical to avoid further deployment, which will waste resources and place people and property at risk. Violations of existing FCC safety limits can be expected to occur 'in the manner deployed and operated."

Factors that Affect Reliability of FCC Compliance Test Results to Date

1) The FCC Equipment Authorization (EA) program in the Office of Engineering and Technology has erred in assuming "*that smart meters are similar to low-power devices like WI-FI base stations*" and "*are not expected to be used close to the body*". Your letter indicates "*(D)etailed evaluation of the SAR is not required if the 20 cm separation distance can be maintained.*" Clearly you are unaware of the hundreds, perhaps thousands of cases where people do not maintain at least 20 cm distance because the meters are located within occupied space on their property or within their home. These people "*do not use smart meters voluntarily this close to their body*" but are placed into potentially dangerous situations involuntarily by their local utility. Violations of FCC safety limits are predicted.

2) The FCC Equipment Authorization (EA) program does not consider peak power on the Grants of Equipment Operation. This is the appropriate measure of power relevant to interference concerns. Peak power from smart meters must be assessed in light of scores of complaints from consumers who have found that smart meters interfere with other electronics including security systems, lighting controls, ham radio operations, baby surveillance monitors, office equipment, sensitive scientific measurement instruments, arc fault circuit interrupters, ground fault interrupters, and medical implant devices. [1] There is no valid reason for ignoring localized effects from high peak power pulses from smart meters. Complaints about electromagnetic interference can be requested from the California Public Utilities Commission (ssc@cpuc.ca.gov)

3) Reflections in typical home environments necessitate the use of Equation 6 (100% reflection) and even additional factors for reflection where reflective surfaces (tile, concrete, stainless steel, and other typical interiors and appliances) will invalidate test results using Equation 10 (with only 60% reflection). Published studies underscore how use of even the highest reflection coefficient in Equation 6 likely underestimates the potential for reflection and hotspots. [2,3,4]

4) The duty cycle or 'traffic' on smart meters has been substantially underestimated in FCC compliance assessments. Utilities in California are representing the wireless transmissions to occur anywhere from a few times per hour to once per four hours. Yet, measurements in the San Francisco Bay Area of California vary widely from location to location.

   Some show 8-15 wireless transmissions per minute or more. These systems may have duty cycles (RF bursts every few seconds) that greatly increase public exposure, and change the compliance picture in very significant ways. The FCC must evaluate real-life use 'in the manner operated' with far higher duty cycles. Since every meter can be a 'repeater' for other nearby meters, on what basis has the FCC determined the frequency of wireless transmissions that do not originate within one property?

   Further, wireless companies are already promoting the resale and use of smart meter wireless capacity to augment existing cell tower capacity (for wireless communication and data transmission). [5] Nothing prevents the other 5%% or 50% or 90% of wireless capacity from being sold to and used by second-party commercial interests. These plans are already being promoted in the telecom industry literature.

5) Compliance in situations with multiple meters on one wall of a living unit has not been properly assessed. For example, multi-family residential units may have 8 to 16 wireless meters on one wall, where a child may have a bed on the other side of the wall; or a playroom for children, or a work space for home office use, or a bedroom for a convalescing family member, a person with medical implant devices or an aged parent with special medical needs. If the duty cycle is far higher than the FCC has considered, or the reflections are significantly greater, then compliance reports done to date are inadequate.

6) Electronic interference with arc fault circuit interrupters (AFCIs) has been documented with the introduction of wireless smart meters.[1] Pacific Gas & Electric (PG&E) has been required by the CPUC to report on consumer complaints, including those complaints about interference with AFCIs after smart meters have been installed. AFCIs are now mandated for bedrooms, including for lighting controls in the National Electric Code. Such conflicts between the federally-mandated electrical safety code and the smart meter rollout underscores the complete inadequacy of studies prior to their mass deployment in the United States. AFCIs are specialized safety controls on electrical wiring that are installed to prevent electrical wiring fires.

The assertion you make that "*the meters' contributions to the total potential exposure at any location are small, as only the nearest few transmitters can add meaningfully to the total*" is an unsupportable conclusion, as you have been misled on basic operational modes for a meter, and multiple meters in one location. With far higher levels of reflection and 'traffic' taken into account, the combined power density and SARs may be substantial, and will likely violate existing limits for uncontrolled public access, and for localized exposures. Each meter has multiple antennas within it, and they operate in virtually all directions (are omnidirectional). Thus residents may likely find areas on their property and within their homes that are exceptionally high wireless exposure zones, and therefore unusable. Further complicating the assessment is the use of personal wireless devices and home systems (security systems, etc.) that already use up some of the allotted exposure background. None of these factors is adequately assessed in existing compliance testing.

7) The assertion that "*the general issue of cumulative exposure from an arbitrary group of transmitter installations or from all transmitters distributed in the environment can appear complex*:… "*signal losses ensures that only the contributions of nearby transmitters are significant*" does not take into account the existing background radiofrequency and microwave radiation burden from other sources, including proximity to AM, FM, TV and other wireless facilities. The combined RF/MW exposures may well place people and their property "over the top and in violation" with the addition of smart meters and the relay function for other homes in the area.

8) Your response on interference with medical devices is not reassuring. Part 15 of the FCC Rules that are meant to avoid interference with "*WI-FI devices, cell phones and other typical consumer products*" are not preventing such interference today, as the FCC and FDA heard in the recent proceeding on medical implants and RF interference." [7] It is one thing to say that people with sensitive medical implants subject to electronic interference should avoid using cell phones or flying on airplanes; it is another thing entirely to put a device on one's home that can cause the same level of health threat, and is quite unavoidable by the occupant. To say that "*certain medical devices may need specific precautions in many other environments; these are generally considered during FDA approval of the individual medical devices*" is to ignore the reality of people who already are implanted with deep brain stimulators, who will be unable to live in the homes they inhabit now, or work in their offices because of the additional threat of disconnecting or disabling of their life-saving devices.

The Department of Justice administers rules and regulations for Americans with Disabilities, and should be brought into this discussion while the FCC further investigates smart meter compliance issues. The rights of ADA patients with sensitive medical devices that are subject to electronic interference who may be disabled or face lethal consequences from such interference are not sufficiently considered in FCC assessments to date. As the CPUC and perhaps other state utility regulatory agencies are relying on the FCC's assertion of compliance, the issues raised in this letter have great consequence to millions of ratepayers if it is a false assurance of safety.

The issue of smart meter rollout nationwide is likely to have significant impacts on health, security, electromagnetic interference, privacy, on people with medical implant devices, on potential fires and on the value and utility of private properties as a result of these combined effects.

By August 15, 2010, the California Public Utilities Commission received over 5000 complaints from PG&E consumers alone about smart meter performance problems.[7] Widespread public concern is evidenced in news media, much of it indicating the difficulty consumers have in filing such complaints. As a result, the consumer complaint totals are probably much higher for PG&E customers, and there is no CPUC process yet to collect complaints from SCE or SDG&E customers. It is unrealistic to expect individual consumers to make time-consuming complaints also to the FCC, and seek individual investigations and redress from the FCC as you conclude in your August 6th response.

Thank you for your timely attention to this matter. I will be forwarding copies to relevant California and federal legislators and committee members.

Kind regards,

Cindy Sage, MA
Sage Associates

References

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[3.] Hondou T Ueda T Sakat Y Tanigwa N Suzuki T Kobayashi T Ikeda K. Passive Exposure to Mobile Phones: Enhancement of Intensity by Reflection, Journal of the Physical Society of Japan Vol. 75, No. 8, August, 2006, 084801 (2006) The Physical Society of Japan

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http://gigaom.com/cleantech/att-taps-into-smart-grid-with-smartsynch/
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http://seekingalpha.com/article/131405-at-t-smartsynch-cellular-smart-meter-partnership-signs-up-first-utility

[6.] Joint FCC/FDA hearings, July 2010. FCC Docket No. ET 10-120; FDA Docket No. FDA-2010-N-0291
Federal Communications Commission (FCC) and Food and Drug Administration (FDA) to Hold Public Meeting on Regulatory Issues Arising from Health Care Devices that Incorporate Radio Technology Wireless Communications Networks to address the joint FDA/FCC hearing on *"challenges and risks posed by the proliferation of new sophisticated medical implants and other devices that utilize radio communications to effectuate their function, as well as challenges and risks posed by the development and integration of broadband communications technology with health care devices and applications."*

[7.] California Public Utilities Commission, Public Advisor's Office, Data on Smart Meter Contacts through August 15, 2010