

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**



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Application of Wilner & Associates for  
Modification of D.06-07-027 and D.09-03-026

Application 11-01-002  
(Filed January 5, 2011)

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)  
MOTION TO DISMISS WILNER & ASSOCIATES  
APPLICATION 11-01-002 AND DECLARATIONS OF  
MICHAEL C. HERZ AND DANIEL M. PARTRIDGE IN  
SUPPORT THEREOF**

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Dated: February 7, 2011

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**I. INTRODUCTION**

Pursuant to Rule 11.1 and 11.2 of the Rules of Practice and Procedure of the California Public Utilities Commission (“CPUC”), Pacific Gas and Electric Company (“PG&E”) hereby moves for the dismissal of Wilner & Associates (“Wilner”) Application for Modification of D.06-07-027 and D.09-03-026. Wilner’s Application seeks to reopen PG&E’s SmartMeter™ proceedings years<sup>1</sup> after the Commission issued the subject Decisions for the stated purposes of examining 1) the health, and safety impacts of SmartMeter™-related electromagnetic, radio frequency (RF) emissions, and 2) the security of the remote disconnect functionality. Wilner’s Application does not present new, material facts that would warrant the Commission reopening PG&E’s SmartMeter™ decisions.

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<sup>1/</sup> Wilner’s present Application for Modification was submitted more than four years after issuance of D.06-07-027, and more than one year after issuance of D.09-03-026. CPUC Rule of Practice and Procedure 16.4(d) requires parties seeking to modify a Commission Decision to do so within one year or to explain why the Petition could not have been presented within one year. The allegations made by Wilner could have been raised within one year of the Decisions. For this reason, Wilner’s request for a modification is procedurally deficient.

Further, Wilner's Application does not dispute the following facts:

- The Federal Communications Commission (FCC) regulates RF emissions and has promulgated strict standards establishing safe RF exposure levels;
- PG&E's SmartMeters™ are certified by the FCC and the exposure levels from SmartMeters™ are well below the FCC standards;
- PG&E's SmartMeters™ result in much smaller levels of electromagnetic frequency RF exposure than many existing common household electronic devices;
- The weight of scientific standard does not support allegations that low-level RF from SmartMeters™ cause adverse health impacts.

Based in large part on the facts set forth above, the Commission recently declined to reopen its SmartMeter™ decisions. (See, D.10-12-001, <sup>2</sup>dismissing *Application of EMF Safety Network for Modification of D.06-07-027 and D.09-03-026*). Wilner's Application should be similarly dismissed.

Wilner's hypothetical assertions related to the SmartMeter™ remote disconnect functionality also fail to justify reopening PG&E's SmartMeter™ decisions. The inclusion of remote-disconnect functionality as a universal part of PG&E's upgraded SmartMeter™ technology was a key element of PG&E's SmartMeter™ Upgrade proceeding. The issue was fully litigated and approved by the Commission in PG&E's SmartMeter™ Upgrade Decision. Wilner's Application presents no new or changed facts that would warrant revisiting the remote disconnect issue.

## **II. FACTUAL BACKGROUND**

### **A. History of the SmartMeter™ Project**

On July 20, 2006, the CPUC approved PG&E's original AMI Project in D.06-07-027. On March 13, 2009, the CPUC approved PG&E's SmartMeter™ Upgrade Program in D.09-03-026. Since then, PG&E has installed over 7.6 million electric and gas

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<sup>2</sup> On January 5, 2011, EMF Safety Network filed an Application for Rehearing of this Decision. On January 20, 2011, PG&E filed Response of PG&E in Opposition to EMF Safety Network's Rehearing Application.

SmartMeters™. Deployment is scheduled to be completed in 2012.

### **B. The Electromagnetic Field (EMF) Spectrum**

EMF, an abbreviated form synonymous with electromagnetic fields, is the whole electromagnetic spectrum. EMF sources are ubiquitous in modern society. The electromagnetic spectrum encompasses a wide range of sources of electric and magnetic fields ranging from the lowest frequency naturally occurring magnetic fields of the earth (i.e., 0 Hz – Earth’s magnetic field) to very high frequency x-rays and gamma rays at the other end of the spectrum. (Herz Decl., Para. 3). The sources of EMFs are distinguished by the frequency at which they exist or operate. (Herz Decl., Para. 4). PG&E’s SmartMeters™ are within the radio frequency (RF) band of the EMF spectrum. (Herz Decl., Para. 5). Radio frequency includes both radio waves and microwaves, found on the electromagnetic spectrum, in the frequency range of 3 kilohertz (kHz) to 300 gigahertz (GHz). (Herz Decl., Para. 6).

### **C. Description of SmartMeter™ and its Operating Frequency on the Electromagnetic Field (EMF) Spectrum**

PG&E’s electric SmartMeter™ technology is a solid-state electric meter that includes two low power radios embedded in it. It is capable of both transmitting and receiving a signal. The primary radio uses RF signals in the 902-928 MHz band on the electromagnetic spectrum to communicate with PG&E over the SmartMeter™ electric mesh network. The secondary radio, not currently in use but which can be made operational in the future, operates in the 2.4-2.5 GHz band on the electromagnetic spectrum. The secondary radio is only enabled if the customer decides to implement an integrated Home Area Network (“HAN”) that uses utility and meter data. A customer may in the future choose this option to support home energy management systems and

radio-enabled smart appliances. Additionally, PG&E's SmartMeter™ gas meter technology uses low power radio frequency signals in the 450–470 MHz band. PG&E's gas SmartMeter™ module does not communicate with a Home Area Network. (Partridge Decl. para. 4).

SmartMeter™ employs commonplace radio technology similar in nature to the radio technology used in the myriad of radio devices that are all within the electromagnetic spectrum and are in widespread use in our homes, businesses, commercial establishments, and public facilities. Meters with a SmartMeter™ radio are typically located on the outside of buildings at some distance away from human inhabitants, and transmit for a very short duration. In contrast, many of the other radio devices used in our society operate in close proximity to humans and emit radio frequency energy for extended time periods. (Partridge Decl. para 5).

Exposure to RF electromagnetic frequencies from SmartMeter™ is considerably less than the exposure from other radio devices in widespread use. Commercial radio devices in common use include:

- Cellular Telephones – Held in contact with the body while transmitting radio frequency energy for extended periods of time.
- Bluetooth Earpieces for Cellular Telephones – Inserted in the ear while transmitting radio frequency energy for extended periods of time.
- Cordless Telephones – Held in contact with the body while transmitting radio frequency energy for extended periods of time.
- Laptop Computers – “Wi-Fi” radios are incorporated into laptop computers to provide network and/or Internet access, and are used close to the body while transmitting radio frequency energy for extended periods of time.
- “Wi-Fi” Access Point – “Wi-Fi” radios are incorporated into routers, cable modems, DSL modems, and other consumer electronic equipment, and are used in the same room as humans

while transmitting radio frequency energy for extended periods of time.

- Remote Keyless System – Used to lock and unlock automobile doors, held in the hand while transmitting a burst of radio frequency energy.
- Remote Garage Door Opener – Operated at arm's length from the body while transmitting radio frequency energy to open and close overhead door.
- Microwave Oven – Used in residential kitchens in the same room as humans, while producing high power levels of radio frequency energy for extended periods of time, with some RF energy leakage from the oven door.
- Wireless Baby Monitors – Used in the presence of babies to transmit sound to a remote monitor, emitting radio frequency energy for extended periods of time.
- Wireless Holter Monitors – Used in hospitals and home health care situations, worn on the body, to record and transmit medical data to a remote monitor through radio frequency transmissions.
- Wireless Infusion Pumps – Used in hospitals and home health care situations, in close proximity to the body, to control the infusion of drugs.
- Motion Detectors – Used in residential and industrial settings to detect the presence of intruders through the transmission and reflection of radio frequency energy from an individual.
- Wireless Security Systems – Used widely in residential settings to alert inhabitants of intrusions through doors and windows while transmitting radio signals through the home.
- Wireless Thermostats – Used in residential and industrial settings, in the same room as humans, to transmit sensed temperature to a remote controller.
- Wireless Smoke Detectors – Used in residential and industrial settings, in the same room as humans, to transmit a warning signal to a remote controller.

There are many other wireless devices in commonplace use in addition to the radio devices listed above. These devices often involve more frequent radio transmission, emit radio frequency energy for longer periods of time, and operate in closer proximity to humans, than PG&E SmartMeter™ devices. (Partridge Decl. para 6).

#### **D. FCC Regulations of RF Electromagnetic Fields**

In the United States, the FCC has regulatory authority over radio frequency equipment and the use of the radio spectrum. Since 1996, the FCC has required that all wireless communications devices sold in the United States meet minimum guidelines for safe human exposure to RF. The FCC coordinates with other federal health, safety and environmental agencies to help determine safe levels for human exposure to RF energy. In adopting its guidelines for RF exposure, the FCC considered the input from these agencies as well recommendations from non-profit, expert organizations like the Institute of Electrical and Electronics Engineers (IEEE) and the National Council on Radiation Protection and Measurements (NCRP), among others.

A succinct explanation of FCC's policy regarding radio frequency safety is found on the FCC Web site<sup>3/</sup>:

#### ***FCC Policy on Human Exposure to Radiofrequency Electromagnetic Fields***

*The FCC is required by the National Environmental Policy Act of 1969, among other things, to evaluate the effect of emissions from FCC-regulated transmitters on the quality of the human environment.*

*Several organizations, such as the American National Standards Institute (ANSI), the Institute of Electrical and Electronics Engineers, Inc. (IEEE), and the National Council on Radiation Protection and Measurements (NCRP) have issued recommendations for human exposure to RF electromagnetic fields. On August 1, 1996, the Commission adopted the NCRP's recommended Maximum Permissible Exposure limits for field strength and power density for the transmitters operating at frequencies of 300 kHz to 100 GHz. In addition, the Commission adopted the specific absorption rate (SAR) limits for devices operating within close proximity to the body as specified within the ANSI/IEEE C95.1-1992 guidelines. (See Report and Order, FCC 96-326) The Commission's requirements are detailed in Parts 1 and 2 of the FCC's Rules and Regulations (47 C.F.R. 1.1307(b), 1.1310, 2.1091, 2.109). The potential hazards associated with RF electromagnetic fields are discussed in OET*

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<sup>3/</sup> See <http://www.fcc.gov/oet/rfsafety/>

*Bulletin No. 56, "Questions and Answers About the Biological Effects and Potential Hazards of Radiofrequency Electromagnetic Fields."*

**E. Regulations Specifically Applicable to SmartMeter™**

All SmartMeter™ technology radios are regulated by the FCC<sup>4/</sup> and certified under CFR Title 47. Part 15 of this regulation applies to electric meters and Part 90 applies to gas meters. (Partridge Decl. para. 8). Certification is an authorization issued by the FCC for equipment, based on the representations and test data from a sample unit submitted by the applicant. Certification attaches to all of the units which are identical to the sample tested when subsequently marketed by the grantee. (Partridge Decl. Para 9). Consumer and various industrial electronic equipment in the U.S. also are regulated under FCC Part 15. Part 15 is applicable to any intentional, unintentional, or incidental radiator that can be operated without an individual license. FCC Part 15 also covers technical specifications, administrative requirements and other conditions relating to the marketing of FCC Part 15 devices. (Partridge Decl. para 10).

The Part 15 electric SmartMeter™ technology radios operate in the frequency ranges (e.g., 902-928 MHz and 2.4 -2.5 GHz) designated by the FCC as the “Industrial, Scientific, and Medical or ISM bands.”<sup>5/</sup> These radios are regulated as *intentional radiators* under FCC Part 15 Subpart C, Section 247.<sup>6/</sup> (Partridge Decl. para.12). Thus, certification is the process used to ensure compliance.

The FCC issues an identification number that demonstrates compliance. This identification number must be attached to each wireless device when it is produced. FCC

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<sup>4/</sup> The Electronic Code of Federal Regulations applicable to the FCC can be viewed online at <http://ecfr.gpoaccess.gov/>, under Title 47 – Telecommunications.

<sup>5/</sup> The detailed technical requirements under which the unlicensed Part 15 radios operate can be viewed online at [http://www.access.gpo.gov/nara/cfr/waisdx\\_00/47cfr15\\_00.html](http://www.access.gpo.gov/nara/cfr/waisdx_00/47cfr15_00.html), under Part 15.247.

<sup>6/</sup> As defined by the FCC, an *intentional radiator* is “a device that intentionally generates and emits radio frequency energy by radiation or induction.”

Part 15 Subpart A contains specific information regarding testing and certification, such as the scope of the rules and legal implications, definitions, and labeling. (Partridge Decl. para 9).

The various types of intentional radiators covered by Subpart C include cable-locating equipment, cordless telephones, remote control and alarm transmitters, field-disturbance sensors for opening doors, and spread-spectrum systems for wideband data transmission. The FCC Part 15 Subpart C rules for operation of radio transmitters, for the most part, are very detailed regarding fundamental field strength, power and/or power density, frequency accuracy, and permitted harmonic and spurious emissions. (Partridge Decl. para 13).

The Part 90 gas SmartMeter™ technology radios operate in a frequency band (e.g. 450-470 MHz) designated by the FCC for “Public Safety, Industrial/Business Radio Pool, and for Radiolocation Radio Services.”<sup>7/</sup> Licensing relates to FCC permission to use a particular frequency. Certification is one of the methods of enforcement to ensure that equipment complies with FCC regulations. Part 90 states the conditions under which such radio communications systems may be licensed and used. Similar to Part 15 radios, the Part 90 SmartMeter™ radios are also certified by an accredited laboratory to operate within the technical guidelines imposed in the Part 90 regulations. Certification attaches to the units subsequently marketed by the grantee, and an FCC identification number is issued to show compliance.<sup>8/</sup> (Partridge Decl. para 14, 15).

If the FCC determines that exposure from an approved wireless device exceeds its guidelines, it can withdraw its approval. In addition, if the FDA determines that RF

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<sup>7/</sup> The detailed technical requirements under which the licensed Part 90 radios operate can be viewed online at [http://www.access.gpo.gov/nara/cfr/waisidx\\_00/47cfr90\\_00.html](http://www.access.gpo.gov/nara/cfr/waisidx_00/47cfr90_00.html), under Part 90.203-219.

<sup>8/</sup> FCC identification numbers for certified radio devices can be researched on the FCC equipment authorization system at <https://fjallfoss.fcc.gov/oetcf/eas/>.

exposure from a device is hazardous, it can require the manufacturer of the device to notify users of the health hazard and to repair, replace, or recall the device. (Partridge Decl. para 16). The FCC has taken neither of these steps with respect to PG&E's certified SmartMeter™ devices. In fact, in a recent letter, the FCC again explicitly affirmed its authority over this subject and confirmed that SmartMeter™ devices are compliant with RF emissions exposure limits. (*See*, Federal Communications Commission Letter addressed to Ms. Cindy Sage, dated August 6, 2010) (Attachment A).

**F. Recent Independent Studies Evaluating Health Impact of Radio Frequency from Smart Meters**

In addition to the protective FCC standards, a significant body of underlying scientific evidence exists demonstrating that there are no known health effects associated with the low level SmartMeter™ RF emissions. For example:

**World Health Organization:**

- [Electromagnetic fields and public health: Base stations and wireless technologies](#)
- [Electromagnetic fields and public health: Electromagnetic hypersensitivity](#)
- [Electromagnetic fields and public health: mobile phones](#)

**International Commission on Non-Ionizing Radiation Protection:**

- <http://www.icnirp.de/documents/RFReview.pdf>

Even more recently, two State (California and Maine) agency reports looked specifically at potential health impacts from SmartMeters™ in light of customer concerns about EMF RF exposure. Both the California Council of Science and Technology

(CCST)<sup>9</sup> and the Maine Center for Disease Control & Prevention (“Maine CDC”)<sup>10</sup> issued their reports within recent months concluding that there is no consistent or convincing scientific evidence to support a concern for health effects related to SmartMeter(™) RF emissions.

### III. DISCUSSION

#### A. **Wilner’s Application Raises the Exact Issue that the Commission Recently Addressed in the EMF Safety Network Application, and The Commission’s Conclusion There that the SmartMeter™ Minimal RF Exposure Level Does Not Warrant a Modification of its Decisions is Equally Applicable to Wilner’s Application.**

Wilner’s Application argues that PG&E’s SmartMeter™ RF emissions cause negative health impacts to individuals with electromagnetic hypersensitivity. (Wilner Application, p.4). The Commission recently issued Decision 10-12-001 dismissing the Application of EMF Safety Network which similarly argued that SmartMeter™ deployment should be halted based on negative health and safety impacts from SmartMeter-related RF exposure. (*See, EMF Safety Network Application for Modification, A.10-04-018*). Specifically, like Wilner, EMF Safety Network stated in its Application for Modification that it had “a clear and compelling interest in health, environmental and safety impacts of chronic RF exposure from the SmartMeter program, *especially impacts on the EMF sensitive [individuals] . . .*”(Id., p.3)(emphasis added).

After reviewing the FCC RF exposure safety standards and finding that PG&E’s SmartMeters™ fall well below safe exposure levels, the Commission dismissed EMF Safety Network’s Application “see[ing] no reason to reopen . . . prior Smart Meter decisions to address these alleged health concerns at this time given the relatively tiny

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<sup>9/</sup> The CCST issued its Report “Health Impacts of Radio Frequency From Smart Meters” on January 11, 2011. CCST accepted public comments on its Report through January 31, 2011.

<sup>10/</sup> Maine Center for Disease Control, Review of Health Issues Related to Smart Meter, November 8, 2010.

contribution Smart Meters will make to RF exposure relative to other sources in our modern environment.” (See, *Decision Granting Motion of Pacific Gas and Electric Company to Dismiss Application*, D.10-12-001). The reasoning articulated in the Commission’s recent Decision dismissing EMF Safety Network’s Application is equally applicable to Wilner’s allegations about SmartMeter-related EMF RF exposure. The Commission should dismiss Wilner’s Application consistent with its recent precedent.

**B. PG&E’s SmartMeter™ RF Emissions Level is Low and Safe by Every Known Scientific Standard**

Despite Wilner’s attempt to recast the same argument made by EMF Network, the key facts remain the same -- PG&E’s SmartMeter™ RF emissions are well below FCC standards and de minimus compared to the RF emissions levels of many commonly used household devices. (See D.10-12-001, p9). For electric SmartMeters™, the RF fields at 10 feet or beyond measure less than 0.1 microwatts per square centimeter for the 900 Mhz band on the EMF spectrum; this exposure at 10 feet 1/ six thousandth of the safety limits set by the FCC. (Partridge Decl. para 7). The vast majority of scientific evidence demonstrates that there is no evidence of negative health impacts from the low level of RF emissions from SmartMeters™. (See, e.g., World Health Organization studies and International Commission on Non-Ionizing Radiation Protection study, *see infra*. Section II.f.).

Moreover, as discussed, a recent study conducted by CCST looked specifically at the alleged health impacts related to SmartMeter™ RF exposure, and further validated the fact that PG&E’s SmartMeters™ do not cause negative health effects. The CCST Report entitled “Health Impacts of Radio Frequency From SmartMeters, January 2011<sup>11</sup>,”

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<sup>11</sup> The CCST Report referenced here was issued on January 11, 2011. Public comments on the CCST Report were due on January 31, 2011.

includes the following key findings:

- The FCC Standard provides an adequate factor of safety against known thermally induced health impacts of smart meters and other electronic devices in the same range of RF emissions. (Report Findings, p.7)
- At this time there is no clear evidence that additional standards are needed to protect the public from smart meters or other common household electronic devices. (Report Findings, p.8)

Another recent study looking specifically at health issues related to Smart Meters also validates the vast majority of scientific evidence that minimal RF emissions emitted by smart meters do not cause adverse health impacts. The Maine Center for Disease Control & Prevention, in response to smart meter-related health complaints to the Maine PUC, conducted a review of “numerous materials sent to [the Maine CDC project team] by both opponents and proponents of smart meters” as well as “health studies and assessments by government agencies and some affiliated private and academic organizations.” The project team concluded:

[O]ur review of these agency assessments and studies do not indicate any consistent or convincing evidence to support a concern for health effects related to the use of radiofrequency in the range of frequencies and power used by smart meters. **They also do not indicate an association of EMF exposure and symptoms that have been described as electromagnetic sensitivity.**

Maine CDC Executive Summary of Review of Health Issues Related to Smart Meters (November 8, 2010), p.4 (emphasis added).

In addition to the independent studies that have been conducted specific to the RF electromagnetic fields emitted by SmartMeters™ and appropriately relied on by the Commission, the Commission itself previously has addressed EMF concerns related to utility transmission and substation projects and has been “consistently unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences.” (D.06-01-042, 2006 Cal.PUC LEXIS

41, at \*2).

The Commission, consistent with its responsibility to ensure public health and safety associated with utility facilities, can appropriately rely on the FCC, CCST and other agencies with expertise on health and safety impacts from RF electromagnetic field exposures. (*See, San Diego Gas & Electric Co. v. Superior Court (Covalt)*, 13 Cal.4<sup>th</sup> 893)(S.Ct. 1996)(finding that the Commission can “enlist[...] the assistance of other state agencies or private contractors in carrying out its responsibilities” to ensure the safety of utility facilities)(p.946). Given SmartMeters™ compliance with FCC standards and the weight of scientific evidence related to RF electromagnetic exposure from SmartMeter™ devices, there is no basis for the Commission to halt SmartMeter deployment.

**C. The SmartMeter™ Remote Disconnect Functionality was a Central Issue in PG&E’s SMU Proceeding and Wilner’s Hypothetical Concerns about a Security Breach or Inadvertent Use of the Functionality Are Not a Basis to Reopen the SmartMeter™ Upgrade Decision, D.09-03-026**

Wilner makes unfounded assertions related to the theoretical, inadvertent activation of SmartMeters’™ remote disconnect functionality due to a security breach or inadvertent means. (*See, Wilner Application*, stating there is the “possibility” that a customer’s power could be disconnected inadvertently, p.3). However, remote connect/disconnect functionality was a significant characteristic of the upgraded SmartMeter™ technology that the Commission reviewed and approved in D.09-03-026. Specifically, after examining all the evidence presented in that proceeding, the Commission found “PG&E is taking reasonable steps to ensure the effective operation of the integrated load limiting connect/ disconnect switches.” (mimeo at p.17)

Wilner’s Application has not presented any evidence to undermine the Commission’s conclusions. Wilner does not include an attestation to any SmartMeter™

product design defect or any other alleged deficiency that might increase the risk that the remote disconnect functionality will be subject to a security breach or inadvertent activation. Wilner's attempt to halt SmartMeter™ deployment based on unsupported speculative assertions that customers may lose power inadvertently is not a meritorious argument.

With respect to the security of PG&E's SmartMeters™, the Structure Group concluded that "PG&E has developed a cyber security framework that meets the objectives established in the Smart Grid industry's OpenSG AMI-SEC Task Force 'AMI System Security Requirements.'" (See, *PG&E Advanced Metering Assessment Report*, Commissioned by the California Public Utilities Commission, at p.16)(September 2, 2010).

**D. Wilner Has Failed to Meet the Standard For Modification of a Commission Decision**

Wilner's Application to Modify is fatally deficient because Wilner has not identified material new facts that would warrant modification of the Commission's decisions authorizing PG&E's SmartMeter™ deployment. CPUC Rule of Practice and Procedure 16.4 governing petitions for modification provides, in part, that:

- (b) A petition for modification of a Commission decision must concisely state the justification for the requested relief and must propose specific wording to carry out all requested modifications to the decision. Any factual allegations must be supported with specific citations to the record in the proceeding or to matters that may be officially noticed. Allegations of new or changed facts must be supported by an appropriate declaration or affidavit.

The Commission has further clarified that the standard for revisiting and modifying final decisions pursuant to Rule 16.4 is a "persuasive indication of new facts or a major change in material circumstances." (See, *Application of the Exposition Metro Line Construction Authority*, D.09-02-032, issued February 23, 2009). Wilner has not identified any such

new facts. To the contrary, the recent issuance of the CCST Report by an independent California agency is a material new fact that weighs heavily in favor of a Commission decision dismissing Wilner's Application.

#### **IV. CONCLUSION**

For the foregoing reasons, PG&E respectfully requests that the Commission dismiss Wilner's Application for Modification of D.06-07-027 and D.09-03-026.

Respectfully Submitted,

ANN KIM  
CHONDA J. NWAMU

By: \_\_\_\_\_ /s/  
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I, Michael C. Herz, declare as follows:

1. I am the EMF Program Manager at Pacific Gas and Electric Company ("PG&E"). I am responsible for communicating information about the issue of electromagnetic fields (EMF) to customers and employees. I have been an employee of Pacific Gas and Electric Company for 26 years.

I received a Bachelor of Science Degree in Electrical Engineering from California State University, Fresno. I am a registered Professional Electrical Engineer in the State of California. I am a member of the following organizations; Power Engineering Society of IEEE, Bioelectromagnetics Society, Eta Kappa Nu - Electrical Engineering Honor Society, Tau Beta Pi - National Engineering Honor Society, and Phi Kappa Phi - National Honor Society.

2. The purpose of my declaration is to provide background about EMF as it relates to the SmartMeter™ Project.

**THE EMF SPECTRUM AND THE SMARTMETER™ PROJECT**

3. The term "EMF" is an abbreviated form of the term electromagnetic fields. EMF is the entire electromagnetic spectrum. The electromagnetic spectrum encompasses a wide range



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I, Daniel M. Partridge, declare as follows:

1. I am the Manager of SmartMeter™ Engineering at Pacific Gas and Electric Company ("PG&E"). I am responsible for the technical specifications of the systems PG&E purchases for the SmartMeter™ Project, certifying that specifications are met, and resolving technical issues as systems are deployed. Various groups report to me, including the Network Radio Frequency (RF) Group.

2. The purpose of my declaration is to provide background about the SmartMeter™ Project, to describe the makeup of a SmartMeter™ and to discuss how a SmartMeter™ is regulated.

**BACKGROUND ABOUT THE SMARTMETER™ PROJECT**

3. On July 20, 2006, PG&E's original AMI Project was approved in D. 06-07-027, and March 13, 2009, PG&E's SmartMeter™ Upgrade Program was approved in D. 09-03-026. To date, more than 7.5 million meters have been installed. Deployment is scheduled to be completed in 2012.

## **MAKEUP OF A SMARTMETER™**

4. PG&E's SmartMeter™ technology is a solid-state electric meter that includes two low power radios embedded in it. It is capable of both transmitting and receiving a signal. The primary radio uses RF signals in the 902-928 MHz band to communicate with PG&E over the SmartMeter™ electric meter mesh RF network. The secondary radio is not currently in use but can be operational in the future. This 2.4 GHz radio is only enabled if the customer decides to implement an integrated Home Area Network ("HAN") that uses utility and meter data. A customer may in the future choose this option to support home energy management systems and radio-enabled smart appliances. Additionally, PG&E's SmartMeter™ gas meter technology uses low power radio frequency signals in the 450-470 MHz band. PG&E's gas SmartMeter™ module does not communicate with a Home Area Network.

5. SmartMeter™ employs commonplace radio technology similar in nature to the radio technology used in the myriad of radio devices that are in widespread use in our homes, businesses, commercial establishments, and public facilities. The SmartMeter™ radio is typically located on the outside of buildings at some distance and blocked by walls from human inhabitants. Also it transmits for a very short duration. In contrast, many of the other radio devices used in our society operate in close proximity to humans and emit radio frequency energy for extended time periods.

6. Exposure to radio frequency energy from SmartMeters™ is considerably less than the exposure from other radio devices in widespread use. Commercial radio devices in common use include:

- a. Cellular Telephones – Held in contact with the human body while transmitting radio frequency energy for extended periods of time
- b. Bluetooth Earpieces for Cellular Telephones – Inserted in the ear while transmitting radio frequency energy for extended periods of time
- c. Cordless Telephones – Held in contact with the human body while transmitting radio frequency energy for extended periods of time

- d. Laptop Computers – “Wi-Fi” radios are incorporated into laptop computers to provide network and/or Internet access, and are used close to the human body while transmitting radio frequency energy for extended periods of time
- e. “Wi-Fi” Access Point – “Wi-Fi” radios are incorporated into routers, cable modems, DSL modems, and other consumer electronic equipment, and are used in the same room as humans while transmitting radio frequency energy for extended periods of time
- f. Remote Keyless System – Used to lock and unlock automobile doors, held in the human hand while transmitting a burst of radio frequency energy
- g. Remote Garage Door Opener – Operated at arm’s length from the human body while transmitting radio frequency energy to open and close overhead door
- h. Microwave Oven – Used in Residential kitchens in the same room as humans, while producing high power levels of radio frequency energy for extended periods of time, with some RF energy leakage from the oven door
- i. Wireless Baby Monitors – Used in the presence of young humans to transmit sound to a remote monitor, emitting radio frequency energy for extended periods of time
- j. Wireless Holter Monitors – Used in hospitals and home health care situations, worn on the human body, to record and transmit medical data to a remote monitor through radio frequency transmissions
- k. Wireless Infusion Pumps – Used in hospitals and home health care situations, in close proximity to the human body, to control the infusion of drugs
- l. Motion Detectors – Used in residential and industrial settings to detect the presence of intruders through the transmission and reflection of radio frequency energy from a human body
- m. Wireless Security Systems – Used widely in residential settings to alert inhabitants of intrusions through doors and windows while transmitting radio signals through the home
- n. Wireless Thermostats – Used in residential and industrial settings, in the same room as humans, to transmit sense temperature to a remote controller
- o. Wireless Smoke Detectors – Used in residential and industrial settings, in the same room as humans, to transmit a warning signal to a remote controller.

There are many other wireless devices in commonplace use in addition to the radio devices listed above. These devices often involve more frequent radio transmission, emit radio

frequency energy for longer periods of time and operate in closer proximity to humans, than the PG&E SmartMeter™ devices.

7. SmartMeter™ emissions will result in exposures that, for most people and most of the time, are minute compared to existing exposure regulations. For endpoint meters, RF fields at 10 feet or beyond will be less than 0.1 microwatts per square centimeter. When compared to FCC regulation on exposure, normally 600 microwatts per square centimeter for the 900 MHz band, the exposure at 10 feet would be more than 6000 times under the safety limits set by the FCC.

#### **REGULATIONS SPECIFICALLY APPLICABLE TO SMARTMETER™**

8. All SmartMeter™ radios are regulated by the FCC, either certified under CFR Title 47, Part 15, of this regulation applies to electric meters and Part 90 applies to gas meters.

9. Certification is an authorization issued by the Commission, based on representations and test data from a sample unit submitted by the applicant. Certification attaches to all of the units which are identical to the sample tested when subsequently marketed by the grantee. An FCC identification number is issued to show compliance. The identification number is included on a label that must be attached to each wireless device when it is produced.

10. Consumer and various industrial electronic equipment in the U.S. are also regulated under FCC Part 15. Part 15 is applicable to any intentional, unintentional, or incidental radiator that can be operated without an individual license. FCC Part 15 also covers technical specifications, administrative requirements and other conditions relating to the marketing of FCC Part 15 devices.

11. Electric SmartMeters™ are certified under FCC Part 15 and subpart A contains specific information regarding testing and certification, such as the scope of the rules and legal

implications, definitions, and labeling. Gas SmartMeters™ are similarly certified but under FCC Part 90 and its associated rules.

12. The Part 15 electric SmartMeter™ radios operate in the frequency ranges (e.g., 902-928 MHz and 2.4-2.5 GHz) designated by the FCC as the “Industrial, Scientific, and Medical or ISM bands.” These radios are regulated as *intentional radiators* under FCC Part 15 Subpart C, Section 247.

13. The various types of intentional radiators covered by Subpart C include cable-locating equipment, cordless telephones, remote control and alarm transmitters, field-disturbance sensors for opening doors, and spread-spectrum systems for wideband data transmission. The FCC Part 15 Subpart C rules for operation of radio transmitters for the most part, are very detailed regarding fundamental field strength, power and/or power density, frequency accuracy, and permitted harmonic and spurious emissions.

14. The Part 90 gas SmartMeter™ radios operate in a frequency band (e.g. 450-470 MHz) designated by the FCC for “Public Safety, Industrial/Business Radio Pool, and for Radiolocation Radio Services.” Part 90 states the conditions under which such radio communications systems may be licensed and used. Licensing relates to FCC permission to use a particular frequency. These radios are licensed to assure users do not interfere with each others’ transmissions.

15. The Industrial/Business Radio Pool covers the licensing of the radio communications of entities engaged in commercial activities, including activities such as SmartMeter™ data collection. In a manner analogous to Part 15 radios, the Part 90 SmartMeter™ radios are certified by an accredited laboratory to operate within the technical guidelines imposed in the Part 90 regulations. Certification attaches to the units subsequently marketed by the grantee, and an FCC identification number is issued to show compliance.

16. If the FCC determines that exposure from an approved wireless device exceeds its guidelines, it can withdraw its approval. In addition, if the FDA determines that RF exposure



**ATTACHMENT A**



Federal Communications Commission  
Washington, D.C. 20554

August 6, 2010

Ms. Cindy Sage  
Sage Associates Environmental Consultants  
1396 Danielson Road  
Montecito, CA 93108-2857

Dear Ms. Sage:

Thank you for your letter of March 15, 2010, in which you request that we review compliance with FCC radiofrequency (RF) exposure limits for the "Smart Meter" technology being implemented by utilities across the country. In particular, you expressed concern about multiple adjacent Smart Meter installations used to service multiple dwellings such as condominiums, and the effect of increased data traffic on exposure from collector or controller units.

The FCC Equipment Authorization (EA) program in the Office of Engineering and Technology has taken a very conservative approach to RF exposure compliance for low-power network devices such as Wi-Fi base stations and Smart Meter transceivers. For such devices that are not expected to be used close to the body, it is generally unnecessary to perform routine specific absorption rate (SAR) evaluations as field strength or power density is a sufficient and appropriate measure of exposure. The maximum field strength at a distance can be derived from the effective radiated power (ERP). Also, FCC field strength limits, like the SAR limits, are time-averaged. Accordingly, for devices that will not be used within 20 centimeters of the body, we rely on the "source-based" time-averaged ERP and require that it be less than our specified values of 1.5 or 3 watts, depending on frequency,<sup>1</sup> in order to ensure compliance with our exposure limits. This does not imply that FCC exposure limits will be exceeded at distances less than 20 cm, but only that detailed evaluation of the SAR is not required if the 20 cm separation distance can be maintained.

It is useful in considering this issue to recognize that the power level specified on the Grants of Equipment Authorization issued by the EA program is the peak power as this is the power relevant to interference concerns. For exposure evaluations, however, the average power is relevant, which is determined by taking into account how often these devices will transmit. Since the purpose of these devices is to provide very infrequent information they transmit in occasional bursts. Thus, for exposure purposes the relevant power is maximum time-averaged power that takes into account the burst nature of transmission, and based on the typical maximum time-averaged transmitter power for many of these devices, they would generally be compliant with the local SAR limit even if held directly against the body.

With respect to multiple adjacent Smart Meter installations, since the antennas for each device are mounted individually on each utility meter, the separation distance from people for most of the transmitting antennas is relatively large compared to 20 cm and the

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<sup>1</sup> See Section 2.1091(c) of the FCC rules.

meters' contributions to the total potential exposure at any location are small, as only the nearest few transmitters can add meaningfully to the total. Further, as a practical design matter, when several of these meters are placed in a cluster, they have to communicate with a single controller. In order to ensure that the controller receives the information properly, only one transmitter can communicate with the controller at a time, eliminating the potential for exposure to multiple signals at the same time.

The general issue of cumulative exposure from an arbitrary group of transmitter installations or from all transmitters distributed in the environment can appear to be complex, but as discussed, the need for orderly communications requires that a few sources normally dominate. In addition, the exponential decrease in signal strength over distance and additional signal losses due to non line-of-sight conditions for distant sources ensures that only the contributions of nearby transmitters are significant.

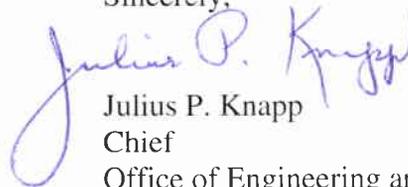
In summary, compliance for Smart Meters is determined according to the operating and installation requirements of each type of meter during equipment certification, and is based on the maximum transmission duty cycle for the device, including relay functions. Necessary installation requirements to maintain compliance for each meter are specified in the Grant. Irrespective of duty cycle, based on the practical separation distance and the need for orderly communications among several devices, even multiple units or "banks" of meters in the same location will be compliant with the public exposure limits. These conditions for compliance are required to be met before a Grant can be issued from the EA program and auditing and review of Grants is a routine function of the FCC laboratory.

With respect to interference to medical devices, which you also raise in your letter, Smart Meters typically operate under Part 15 of the FCC Rules. Those rules specify power limitations to avoid interference. The Smart Meter wireless technologies used today are not significantly different from Wi-Fi devices, cell phones and other typical consumer products. Certain medical devices may need specific precautions in many other environments; these are generally considered during FDA approval of the individual medical device.

I hope that this information will be helpful. In addition, some technical information on the subject has been developed by the Electric Power Research Institute (EPRI) and we have enclosed that information for reference.

Please know that the FCC is continually monitoring the issue of RF exposure and related health and safety concerns, both in the general terms of the continuing propriety of its regulations, and in individual cases where substantive concerns are raised.

Sincerely,



Julius P. Knapp  
Chief

Office of Engineering and Technology

