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April 17, 2012

By Certified Mail

Arizona Corporation Commission
Docket Control
1200 W. Washington St.
Phoenix, Arizona 85007

Docket # E-00000C-11-0328
Re: Smart Meter Opt-Out Program Proposal by Safer Utilities Network

Dear Mr. Olea and Commissioners:

I am pleased to submit the enclosed proposal for a smart meter opt-out program on behalf of my client, Safer Utilities Network. At the March 23 Smart Meter Workshop, we were gratified to learn that the Commission is now considering a general opt-out program that will include the medical needs of my client. Therefore, we have taken a moderate, realistic approach to designing an opt-out program proposal that strikes a balance between the needs of my client and those of the Arizona utilities. It is our desire that the Commission incorporate at least the main features of the enclosed proposal into any opt-out program it implements. Nevertheless, if the Commission ultimately decides to implement an opt-out program with a much more limited scope than the enclosed proposal, I request that my client's medical needs at least be fully met.

Please contact me with any questions or issues you may have concerning this proposal. My direct line is (602) 620-1449. Thank you for your consideration in this matter.

Sincerely,

Frank R. Mead

Enclosed (1)

Arizona Corporation Commission
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SMART METER OPT-OUT PROGRAM FOR THE STATE OF ARIZONA

Introduction

In recent months, some utility customers have expressed concern about health issues related to smart meter technology. A significant number of the customers expressing such concerns are those who suffer from a rare illness, Electrical Hypersensitivity (EHS). Any opt-out program the Commission institutes, if it is to be truly inclusive of all of Arizona's citizens, must take into account the special needs of this disabled population.

The opt-out plan outlined in this document is not focused solely on the health concerns of EHS customers but rather is designed to provide accommodation and protection to all who wish to opt-out due to medical concerns. The special needs of EHS customers will be addressed here in order to ensure that these specific needs will be clearly understood by the Commission.

This opt-out plan is also able to accommodate those customers who have expressed privacy or security concerns, should the Commission decide to address such concerns via an opt-out.

The EHS Population

The total number of Arizona citizens who suffer from severe EHS is estimated at four to five hundred people. This population can be divided into two groups: urban & suburban dwellers and those living in remote rural sanctuaries. Although both groups suffer from their disability, the rural EHS residents are the most impaired, the sickest of the sick. They cannot function in the cities or suburbs due to high ambient levels of EMFs from power lines, cell towers, Wi-Fi and the like and can survive only in areas of very low population density. Snowflake's EHS sanctuary is typical of such refuges, situated miles from town and with homes that have been specially built to reduce EMF exposures.

Both groups of utility customers need to avoid any added burden of EMF exposure and actively seek to do so on a constant basis, working within the constraints of their individual life circumstances. Plans for AMI/AMR impose a direct and unreasonable health burden on this disabled population. It should be noted that, for this population, AMR also presents substantial problems and is not a viable alternative to AMI.

Features of an Effective and Inclusive Opt-Out Program

Any opt-out program which includes customers with medical issues must make every effort to increase its chances for success by choosing the safest alternatives, thus maximizing the predictability of a positive outcome.

I. Eligibility

Residential customers would be eligible without restriction.

A small business would be eligible if it provides housing for a person in need of medical opt-out, such as a small nursing home. A small business is also eligible if an employee's medical opt-out is part of a workplace accommodation under the Americans with Disabilities Act (ADA). If a wireless meter is used and the affected person can be placed at least 100 feet away from that meter, then that business would not qualify for an opt-out.

II. Meters

Opt-out participants would have non-communicating electromechanical meters, henceforth referred to as Analog Meters. The established history of Analog Meters as safe for all citizens increases the likelihood of a positive outcome for the opt-out program.

There must be an adequate stock of Analog Meters to meet demand. Utilities currently in the process of replacing Analogs would warehouse them to service the opt-out program.

Some utilities have proposed opt-out programs whose only meter option consists of a solid-state meter with an offer to turn off or disable the transmitter/receiver function. Such an opt-out program would not achieve the goal of predictable positive outcome due to multiple factors such as:

- Human or computer error in on-site or remote programming of individual meters which may change their safety parameters.
- Switch mode power supplies and other electronics that would generate electrical transients (signals) as by-products of the meter's operation, negatively affecting EHS customers.
- Ever-changing technology as Smart Meters are continually upgraded.

III. Integration of EHS Customers With Mainstream Customers

A. Rural

The existence of rural EHS sanctuaries like Snowflake necessitates an **Advisory** to utilities to refrain from establishing *new* PLC systems in rural areas which meet the criteria stated in III.A.i.

This Advisory would not apply to existing PLC systems, which would be grandfathered in. It appears as if there are no EHS sanctuaries in the geographic areas served by the state's current PLC systems, and therefore we do not advocate any Advisory to those utilities.

PLC signals are so robust that they travel for many miles and cannot be stopped by residential transformers. However, ***substations*** do halt such signals from some PLC systems.

i. If a district or area served by a given substation has an organized group of its residents which file a request with their utility to use alternate methods to PLC, then that utility would make a good faith effort to serve its mainstream customers in that substation's area via alternate metering systems. There are economically viable alternatives to PLC in rural areas such as cellular modem (GPRS) meters. Due to the greater distances between rural homes, the wireless emissions of these cell phone-like meters would not pose a risk to EHS residents.

B. Urban and Suburban

As cited in paragraph I, our proposed opt-out program provides for unrestricted eligibility for residential customers. However, if the Commission should decide not to permit unrestricted eligibility, then EHS customers residing in urban or suburban areas should be allowed to have nearby neighbors (100 feet or less) participate in the opt-out if the neighbors agree to this. Allowing such neighbors to have Analog Meters would be the most desirable option, but if that is not feasible, an alternative would be to disable the transmitter/receiver function of neighbor's meters, providing that the utility takes measures to minimize the potential pitfalls of such meters cited above in paragraph II. Utilities would have no obligation whatsoever to secure the consent and cooperation of any neighbors or landlords, a responsibility that would rest solely with the EHS customer.

IV. Fees

Reasonable fees for Analog Meter installation and for monthly service may be levied. Low income customers should be exempted.

V. Notification

Customers should be notified of the scheduled replacement of their current meter with a new solid-state meter at least 30 days in advance of such replacement. At that time, details of their utilities' opt-out plan should be given to them.

Technical Execution of the Opt-Out Program

There are vital technical issues which must be understood in order to design and execute an effective and inclusive opt-out program.

1) Radio Frequency Radiation from Wireless Meters

Some utility customers have expressed serious reservations about this additional, and involuntary, exposure to radio frequencies (RF).

The trend in wireless meters is to transmit more often now than they did in the recent past, when it was common to transmit only a few times a day. For instance, wireless AMR meters now being deployed by TEP/UniSource transmit every 30 seconds or 2880 times a day.

According to disclosures in California ordered by a judge, wireless "mesh" network meters typically transmit 10,000 times a day. Some transmit up to 190,000 times a day.[1] Mesh meters are now being installed in Arizona as well.

Any rural system of transmitting wireless meters that requires central collectors to gather signals from many households should not site those collectors anywhere near an EHS household.

2) Radiation from Electrical Signals (Transients) on House Wiring

There are two sources of such radiation:

a) Switch Mode Power Supplies and Other Electronics in Solid State Meters

Switch mode power supplies and some electronics in solid state meters can create electrical transients on house wiring as unintended by-products of the meter's function. Such transients can create significant health impacts on customers with EHS. Non-communicating electromechanical meters, henceforth referred to as Analog Meters, do not produce such transients.

The large number of daily transmission from wireless meters and the electrical transients cited in paragraph 2) a) provide the technical rationale and practical necessity for utilizing traditional analog meters in the opt-out program.

b) Power Line Communications (PLC) Systems

Some meter systems communicate by sending data pulses/continuous waves/signals via the existing electrical wires. Such systems are referred to as Power Line Communication or Power Line Carrier (PLC) in the U.S. and PLT in the United Kingdom.

It has been stated by some utilities that PLC systems present an acceptable alternative for customers who are concerned about radio frequencies from a wireless smart meter. While this may be the case for the average customer, it is definitely not the case for EHS customers. ***In fact, PLC technology is possibly the most dangerous technology for people suffering from EHS. A medical opt-out would not be effective for EHS customers in areas with PLC systems even if the opt-out participants have Analog Meters.***

The PLC data signals sent out over the power lines modify the electrical and magnetic fields around the wires, turning those wires into defacto antennas radiating these frequencies. This effect occurs on both local power transmission lines and home wiring. These electrical lines and wires are not designed to carry data communications; they lack the shielding found in telephone, DSL and other wiring which is designed to prevent this antenna effect.

Currently there appears to be three types of PLC systems used by rural utilities in Arizona:

-Hunt "Turtle" TS1
-Hunt TS2
-TWACS

Experiments with PLC systems which use higher frequencies than the above systems have resulted in protests from American Radio Amateurs (ARRL) and the British industry organization Electromagnetic Compatibility Industry Association (EMCIA).[2] A research paper on this subject by the British Broadcasting Corporation (BBC) stated "...there is the difficulty for radio-system users that the signals PLT injects do not simply travel from point to point along the wiring, they also escape as *radiated emissions*" (Emphasis by the paper's author).[3]

Modification of a wire's electrical and magnetic fields by the frequencies carried along it is a phenomenon that is widely understood in the electrical engineering profession and referred to as Electromagnetic Compatibility, EMC.[4] Due to these concerns, many types of PLC systems are restricted in Europe and Japan. Only the low-frequency PLC systems are unrestricted in those countries, due to the fact that they operate at frequencies that are not used for telecommunications.[5]

The PLC systems currently used in Arizona utilize frequencies lower than those objected to by British and European industry and would not interfere with U.S. industry or military. But regardless of the frequencies used, the emission issue for EHS customers remains the same. EHS individuals have been shown to be reactive to a wide range of frequencies and this reactivity can vary widely from individual to individual.[6] Frequencies do not have to be in the RF range in order to

create a problem for EHS customers; ELF and other frequency bands can be just as harmful to customers with EHS as RF frequencies.

Having an Analog Meter would not protect EHS customers from their neighbor's PLC. Unlike the electrical transients generated as unintended by-products from solid-state meters, PLC signals are specifically engineered to travel many miles of power line without attenuation, penetrating barriers which would stop less robust transients. If these systems were not so designed, their data transmissions would be unreliable. Filtering such signals is very difficult and expensive with some systems and impossible with others.

It is these characteristics which make PLC systems so dangerous for EHS customers. Neighborhood PLC signals may penetrate into the home and cause the home's interior wiring to radiate via the antenna effect. PLC signals can also cause the utility line attached to the house's exterior or passing near the house to radiate via the antenna effect. ***In either situation, the individual opt-out Analog Meter would lose much of its benefit to disabled EHS customers.*** This reality provides the technical rationale and practical necessity for the aforementioned Advisory to utilities.

REFERENCES

1. Pacific Gas and Electric Company's response to an Administrative Law Judge's October 18, 2011 ruling directing PG&E to file clarifying radio frequency information, filed before the California Public Utilities Commission on November 1, 2011.

2. Memorandum submitted by Electromagnetic Compatibility Industry Association (EMCIA). Author Keith Armstrong, President. The EMCIA Secretariat is Nutwood UTE Limited, Eddystone Court, DeLank Lane, St. Breward, Bodmin, Cornwall. PL30 4NQ United Kingdom.

3. British Broadcasting Corporation R&D white paper WHP 099. PLT and broadcasting – can they co-exist? Author J.H. Stott, November 2004.

4. Principles of Electromagnetic Compatibility. Author Bernard Keiser. Artech House, 1987.

5. For the Grid and Through the Grid: The Role of Power Line Communications in the Smart Grid. Proceedings of the IEEE June 2011. Authors Stefans Galli, Senior Member IEEE, Anna Scaglione, Fellow, IEEE, Zhifang Wang, Member, IEEE.

6. Electromagnetic Field Sensitivity. William Rea M.D. et al. Journal of Bioelectricity Vol. 10 (1&2), 241-256, 1991.