

OPEN MEETING AGENDA ITEM



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Docket# E-00000C-11-0328

To: The Arizona Corporation Commission

From: Paul H

Attached is information from years ago concerning the politics behind the guidelines in place today.

Arizona Corporation Commission
DOCKETED

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MR

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 8 2002

OFFICE OF
AIR AND RADIATION

Janet Newton
President
The EMR Network
P.O. Box 221
Marshfield, VT 05658

Dear Ms. Newton:

Thank you for your letter of January 31, 2002, to the Environmental Protection Agency Administrator Whitman, in which you express your concerns about non-thermal effects of radiofrequency (RF) radiation and the adequacy of the Federal Communications Commission's RF radiation exposure guidelines. The Administrator has asked us to critically examine the issues you bring to our attention, and we will be responding to you shortly.

We appreciate your interest in the matter of non-thermal RF exposure, possible health risks, and Federal government responsibility to protect human health.

Sincerely,

A handwritten signature in black ink, appearing to read "Frank Marciniowski".

Frank Marciniowski, Director
Radiation Protection Division



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 16 2002

OFFICE OF
AIR AND RADIATION

Ms. Janet Newton
President
The EMR Network
P.O. Box 221
Marshfield, VT 05658

Dear Ms. Newton:

This is in reply to your letter of January 31, 2002, to the Environmental Protection Agency (EPA) Administrator Whitman, in which you express your concerns about the adequacy of the Federal Communications Commission's (FCC) radiofrequency (RF) radiation exposure guidelines and nonthermal effects of radiofrequency radiation. Another issue that you raise in your letter is the FCC's claim that EPA shares responsibility for recommending RF radiation protection guidelines to the FCC. I hope that my reply will clarify EPA's position with regard to these concerns. I believe that it is correct to say that there is uncertainty about whether or not current guidelines adequately treat nonthermal, prolonged exposures (exposures that may continue on an intermittent basis for many years). The explanation that follows is basically a summary of statements that have been made in other EPA documents and correspondence.

The guidelines currently used by the FCC were adopted by the FCC in 1996. The guidelines were recommended by EPA, with certain reservations, in a letter to Thomas P. Stanley, Chief Engineer, Office of Engineering and Technology, Federal Communications Commission, November 9, 1993, in response to the FCC's request for comments on their Notice of Proposed Rulemaking (NPRM), Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (enclosed).

The FCC's current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-ionizing Radiation Protection, are thermally based, and do not apply to chronic, nonthermal exposure situations. They are believed to protect against injury that may be caused by acute exposures that result in tissue heating or electric shock and burn. The hazard level (for frequencies generally at or greater than 3 MHz) is based on a specific absorption dose-rate, SAR, associated with an effect

that results from an increase in body temperature. The FCC's exposure guideline is considered protective of effects arising from a thermal mechanism but not from all possible mechanisms. Therefore, the generalization by many that the guidelines protect human beings from harm by any or all mechanisms is not justified.

These guidelines are based on findings of an adverse effect level of 4 watts per kilogram (W/kg) body weight. This SAR was observed in laboratory research involving acute exposures that elevated the body temperature of animals, including nonhuman primates. The exposure guidelines did not consider information that addresses nonthermal, prolonged exposures, i.e., from research showing effects with implications for possible adversity in situations involving chronic/prolonged, low-level (nonthermal) exposures. Relatively few chronic, low-level exposure studies of laboratory animals and epidemiological studies of human populations have been reported and the majority of these studies do not show obvious adverse health effects. However, there are reports that suggest that potentially adverse health effects, such as cancer, may occur. Since EPA's comments were submitted to the FCC in 1993, the number of studies reporting effects associated with both acute and chronic low-level exposure to RF radiation has increased.

While there is general, although not unanimous, agreement that the database on low-level, long-term exposures is not sufficient to provide a basis for standards development, some contemporary guidelines state explicitly that their adverse-effect level is based on an increase in body temperature and do not claim that the exposure limits protect against both thermal and nonthermal effects. The FCC does not claim that their exposure guidelines provide protection for exposures to which the 4 W/kg SAR basis does not apply, i.e., exposures below the 4 W/kg threshold level that are chronic/prolonged and nonthermal. However, exposures that comply with the FCC's guidelines generally have been represented as "safe" by many of the RF system operators and service providers who must comply with them, even though there is uncertainty about possible risk from nonthermal, intermittent exposures that may continue for years.

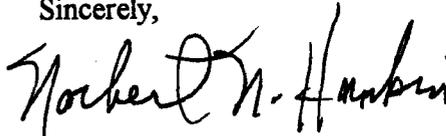
The 4 W/kg SAR, a whole-body average, time-average dose-rate, is used to derive dose-rate and exposure limits for situations involving RF radiation exposure of a person's entire body from a relatively remote radiating source. Most people's greatest exposures result from the use of personal communications devices that expose the head. In summary, the current exposure guidelines used by the FCC are based on the effects resulting from whole-body heating, not exposure of and effect on critical organs including the brain and the eyes. In addition, the maximum permitted local SAR limit of 1.6 W/kg for critical organs of the body is related directly to the permitted whole body average SAR (0.08 W/kg), with no explanation given other than to limit heating.

I also have enclosed a letter written in June of 1999 to Mr. Richard Tell, Chair, IEEE SCC28 (SC4) Risk Assessment Work Group, in which the members of the Radiofrequency Interagency Work Group (RFIAWG) identified certain issues that they had determined needed to be addressed in order to provide a strong and credible rationale to support RF exposure guidelines.

Federal health and safety agencies have not yet developed policies concerning possible risk from long-term, nonthermal exposures. When developing exposure standards for other physical agents such as toxic substances, health risk uncertainties, with emphasis given to sensitive populations, are often considered. Incorporating information on exposure scenarios involving repeated short duration/nonthermal exposures that may continue over very long periods of time (years), with an exposed population that includes children, the elderly, and people with various debilitating physical and medical conditions, could be beneficial in delineating appropriate protective exposure guidelines.

I appreciate the opportunity to be of service and trust that the information provided is helpful. If you have further questions, my phone number is (202) 564-9235 and e-mail address is hankin.norbert@epa.gov.

Sincerely,



Norbert Hankin
Center for Science and Risk Assessment
Radiation Protection Division

Enclosures:

- 1) letter to Thomas P. Stanley, Chief Engineer, Office of Engineering and Technology, Federal Communications Commission, November 9, 1993, in response to the FCC's request for comments on their Notice of Proposed Rulemaking (NPRM), Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation
- 2) June 1999 letter to Mr. Richard Tell, Chair, IEEE SCC28 (SC4) Risk Assessment Work Group from the Radiofrequency Radiation Interagency Work Group

Connection between US Government and Wireless Industry — and the *HUGE ROLLOUT* of Wi-Fi and Smart Meters

Staff writer

In 1993, David Reynard told CNN talk show host Larry King why he was suing the wireless industry. Reynard was alleging that the fatal brain tumor suffered by his late-wife Susan had been caused by her cell phone. In a demonstration that would send a shockwave around the world, the deceased woman's doctor who was also a guest on the show, held his former patient's cell phone next to her x-ray. The location of the tumor corresponded exactly to that of the cell phone's antenna.

Nine years earlier, in 1984, the FDA had exempted cell phones from premarket testing before allowing them to be marketed to the public. Few people who bought the phones knew they emitted microwave radiation. And almost no one knew about a study published in 1975 by a Stanford University biophysicist and neuroscientist named Allan Frey. The results of Dr. Frey's research had shown that microwaves "with certain modulations" could cause leakage in the blood-brain barrier, with possibly lethal consequences.



Dr. George Carlo was chief scientist for the wireless industry between 1993-99.

Fifteen years later in 1999, research headed by another American scientist, George Carlo, would confirm Dr. Frey's finding. Dr. Carlo had been given \$25million dollars in 1993 by the Wireless Trade Association (CTIA) - three months after the "damaging" Larry King Live interview - to oversee research intended to reassure panicked cell phone users.

In his book published in 2001, *Cell Phones: Invisible Hazard in a Wireless Age*, Dr. Carlo tells the inside story of what happened when the results of this research were not reassuring.

EVENTS BETWEEN 1984 - 2013

1984 Despite evidence that the direct exposure to low-level microwave radiation might not be safe, the FDA exempted cell phones from premarket testing in 1984, allowing them to be sold to the public without any FDA oversight.

Same Year Ironically, that same year, the U.S. Air Force completed a 2-year study on the long-term effects of low-level, pulsed microwave radiation (or "Wi-Fi"). The results of the study, published in 1992, would reveal that long-term exposure to the 2.4GHz radiation (the same frequency used by cell phones) resulted in a 260% increase in primary tumors and a 100% increase in metastatic tumors.

January 21, 1993 It wasn't until nine years later, however - when David Reynard appeared on the Larry King Live show with his late-wife's doctor - that the general public would learn about the potential danger they could be exposing themselves to, simply by putting their cell phone next to their head. .

Following Days To keep the public buying and the regulators at bay, Tom Wheeler - president and chief lobbyist for the wireless industry's powerful trade association (CTIA) - made an offer to the FDA. The industry would agree to fund and conduct a large, postmarket study on the safety of cell phones, if the FDA would agree not to regulate cell phones until this research was complete.

Not having done its job back in 1984 before allowing cell phones to be marketed, the FDA *potentially* had as big a problem as the industry. Putting its own self interest first, the FDA accepted Wheeler's offer.

Jan 28, 1993 On June 28, 1993 - exactly one week after the Larry King Live show, Wheeler held a press conference to announce that the wireless industry would sponsor a large research program to investigate the safety of cell phones.

April, 1993 Three months later, Wheeler hired an epidemiologist and public health scientist named George Carlo to head the industry's \$25 million dollar research program intended to reassure the public that cell phones were safe.

Spring-Fall, 1993 Carlo hired close to 200 leading scientists from around the world to perform the research that he would oversee. In addition, he created a peer-review board chaired by Harvard University School of Public Health's well-respected Dr. John Graham.

1993-1994 A conflict between Carlo and Wheeler developed when the scientist insisted on developing the "exposure tools" he felt were necessary to ensure the accuracy of the research results. Wheeler – who had made it clear that the purpose of the research was to *reassure the public* – would grow increasingly uneasy with Carlo.

1995 In 1995, Carlo discovered that his projected costs for the year were more than \$6 million dollars over what the industry said was available. Eventually Carlo would learn that the \$6+ million dollars had been spent on public relations by Wheeler.

1996 By 1996, Carlo's research program was running a deficit. The financial crisis triggered a dispute between Carlo and Wheeler that became known throughout the industry, government, and among trade press journalists.

Also in 1996 That same year, the FCC began auctioning off radiofrequency bands in the microwave portion of the RF spectrum. The FCC agreed to finance a major part of the costs in exchange for a portion of the revenues from cell phones – and later Wi-Fi, which in 2000, would begin to be rolled-out on a massive scale.

This extremely profitable arrangement, which cost the government nothing, secured the infrastructure for wireless technology, rather than fiber optic – which is almost 900,000X faster than wireless and has no health risks.

1997 With the aid of their attorneys, Carlo and Wheeler were able to work out a compromise in 1997. Although the scope of the research as originally planned would be drastically curtailed, the compromise allowed some vital research to go forward.

Dec 21, 1998 On December 21, 1998, Carlo had his first alarming finding: 2.4GHz microwave radiation (used with cell phones, Wi-Fi, and other devices) appeared to cause micronuclei in human blood samples.

This was particularly alarming in view of the strong correlation between micronuclei and cancer. After the Chernobyl accident in 1986, the presence of micronuclei in the blood was used to identify children at high risk for developing cancer.

Following days Not long after the startling results came in, Dr. Carlo's house burned down. The authorities concluded that it was arson, but were never able to solve who did it.

Jan 1999 The following month, the micronuclei results were reproduced, providing conclusive evidence that radiation from a cell phone antenna causes cancer. The results also explained the studies in the scientific literature reporting leakage in the blood-brain barrier, first discovered in 1975 by Dr. Allan Frey.

Febr 1999 At the February 9, 1999 wireless trade show, Carlo reported his findings, and urged the industry to take appropriate steps to protect the public. Although a voice vote was taken pledging to do the right thing, the vote was never recorded.

Oct 1999 When it became apparent that neither the industry, nor the FDA, had any intention of informing the public about the research findings, Carlo agreed to be interviewed. A journalist from the *Boston Globe* later reported:

Almost nobody expected George Carlo, of all people, to warn consumers about the possible dangers of cell phones. Back in 1993, Carlo was dubbed "industry boy" by consumer advocates ... But now that the project is winding down and its final report is due later this year, Carlo has created a stir by saying that consumers should take some precautions when using cellular phones, *even while scientists at the US Food and Drug Administration and elsewhere say that cell phones do not pose any danger to users* [italics added]

Febr 2000 Carlo gave his final report to the industry in February 2000; and in the summer of 2000, he published the results of this research in the peer-reviewed, online journal, *Medscape*.

Oct 2000 In late October, Carlo shared the results of his research with the American public in a national television broadcast (20/20). He also informed viewers that, if they used a cell phone, they were twice as likely to suffer from brain cancer and rare tumors as non-users.

Wheeler, who was given an opportunity to express his view, told 20/20:

Our industry has gone out and aggressively asked the question, 'Can we find a problem?' And the answer that has come back is that there is nothing that has come up in the research that suggests that there is a linkage between the use of a wireless phone and health effects.



Tom Wheeler, president of the Wireless Association (CTIA) between 1992-2004.

Following weeks The industry's response to what it viewed as "Carlo's betrayal" was to try to discredit the scientist – no small task, given that the actual research had been conducted by close to 200 leading scientists from around the world, and peer-reviewed by a board that was chaired by Harvard University's Dr. John Graham.

Two things the industry still had in its favor, however, were (1) the support of the US federal government, and (2) lots of money.

2000 Despite accusations that the health effects of cellular phone radiation were being withheld from consumers by the wireless industry *and the US government*, the FDA proposed a collaborative project with the wireless industry to investigate the issue of whether cell phones presented a danger to the public. The "Cooperative Research and Development Agreement" (or CRADA agreement) that was subsequently signed had been rejected by the FDA back in 1993 as a "conflict of interest."

Summer 2001 During the summer of 2001, the Larry King Live show once again opened with a guest who was suing the wireless industry. This time it was a Baltimore physician who had developed a brain tumor near where he'd always held his cell phone ... and this time, the wireless industry was prepared.

After the responses of the defendants (Motorola and Verizon) were read, two scientists, both of whom – apparently unknown to the show's producers – had previously worked for the industry, gave their input. And finally, the director of the FDA Center for Devices and Radiological Health gave his. Everyone was in agreement that "low-power radio signals" from wireless phones posed no known health risks. As evidence, they cited the conclusions of the FDA and "other authoritative bodies around the world."

Fall 2001 Also in 2001, Dr. Carlo published his book, *Cell Phones: Invisible Hazards in the Wireless Age*. The book provides an insider's account of the events that took place during the six years Carlo was Chief Scientist for the wireless industry. It also summarizes Carlo's findings about genetic damage and cancer.

May 1, 2013

On May 1, 2013, President Barack Obama – apparently having forgotten about his 2008 presidential campaign promise "to close the revolving door that brings major industry players into positions in government that regulate those industries" – nominated Tom Wheeler to head the FCC.

This is the same man who, in 1993, hired Dr. Carlo to conduct research to investigate the safety of cell phones — and then, in 1999, lied to the American people about the results of Dr. Carlo's research.



President Barack Obama announcing his nomination of Tom Wheeler to chair the FCC.

REFERENCES

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Carlo, George. "Effect of Wireless Radiation at Cellular Level" (online video presentation); http://archive.org/details/safewireless.orgDangersofthewirelesscellphone_wi-fiandemfage.

Carlo, George. "EMF Cell Phone Dangers" (online interview); <http://www.youtube.com/watch?v=S9FHPi7DcyY>.

Carlo, George. "Talk Quickly: Your Health is on the Line" (online video presentation); <http://www.youtube.com/watch?v=6D9IsoSX5zg>.

Carlo, George. "Westminster Presentation 2007: Dr. Carlo addresses members of British Parliament" (online video presentation); <http://www.youtube.com/watch?v=Bhn9iKiw08>.

Carlo, George. "Wi-Fi in Schools" (online interview); <http://www.youtube.com/watch?v=IgL09yR1JlQ>.