

**From:** [Melnykovych, Andrew \(PSC\)](#)  
**To:** "song\_bird"  
**Subject:** RE: Your comments in Case 2012-00428, smart grid administrative case  
**Date:** Monday, October 12, 2015 4:17:08 PM

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Dear Ms. Holloway:

Thank you for your comments to the Kentucky Public Service Commission regarding the use of smart grid technology by electric utilities in Kentucky. Your comments will be placed into the case file for the Commission's consideration as it deliberates in this matter.

As I indicated in my earlier e-mail, the record in this case is now closed and the case is with the Commissioners for a final decision. Further public comments will not be accepted.

Records in the case are available on the PSC website at this location:  
<http://psc.ky.gov/Home/Library?type=Cases&folder=2012> cases/2012-00428

Thank you for your interest in this matter.

*Andrew Melnykovych*

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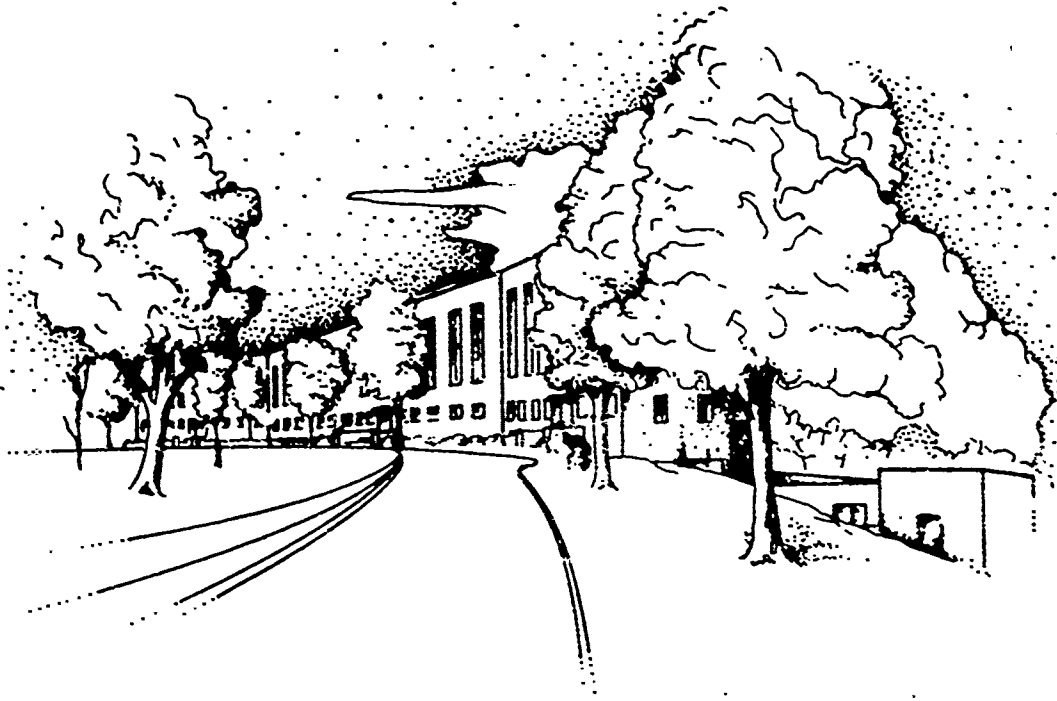
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# NMRI

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**BIBLIOGRAPHY OF REPORTED BIOLOGICAL PHENOMENA ('EFFECTS') AND CLINICAL  
MANIFESTATIONS ATTRIBUTED TO MICROWAVE AND RADIO-FREQUENCY RADIATION**

**RESEARCH REPORT**

**MF12.524.015-0004B**

**REPORT NO. 2  
REVISED**

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**BIBLIOGRAPHY OF REPORTED BIOLOGICAL PHENOMENA ('EFFECTS') AND CLINICAL  
MANIFESTATIONS ATTRIBUTED TO MICROWAVE AND RADIO-FREQUENCY RADIATION**

**Zorach R. Glaser, Ph.D.  
LT, MSC, USNR**

**Research Report**

**Project MF12.524.015-0004B, Report No. 2**

**Naval Medical Research Institute  
National Naval Medical Center  
Bethesda, Maryland 20014, U.S.A.**

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## ABSTRACT

More than 2000 references on the biological responses to radio frequency and microwave radiation, published up to June 1971, are included in the bibliography.\* Particular attention has been paid to the effects on man of non-ionizing radiation at these frequencies. The citations are arranged alphabetically by author, and contain as much information as possible so as to assure effective retrieval of the original documents. An outline of the effects which have been attributed to radio frequency and microwave radiation is also part of the report.

\*Three supplementary listings bring the number of citations to more than 2300.

### Key Words

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Non-Ionizing Radiation  
Radar Hazards  
Radio Frequency Radiation  
Microwave Radiation  
Health Hazards  
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The comments upon and criticisms of the literature made in this report, and the recommendations and inferences suggested, are those of the author, and do not necessarily reflect the views of the Navy Department or of the Naval Service.

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13. ABSTRACT

More than 2300 references on the biological responses to radio frequency and microwave radiation, published up to April 1972, are included in this bibliography of the world literature. Particular attention has been paid to the effects on man of non-ionizing radiation at these frequencies. The citations are arranged alphabetically by author, and contain as much information as possible so as to assure effective retrieval of the original documents. Soviet and East European literature is included in detail. An outline of the effects which have been attributed to radio frequency and microwave radiation is included as Chapter 1. The revised report (which supersedes DDC report AD#734391) is updated with the inclusion of three supplementary listings, and has incorporated many corrections and additions to the original 2100 citations.

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## Foreword

It is the hope of the author that this bibliography will provide guidance to the diffuse and conflicting literature on the biological responses to electromagnetic radiation at radio- and microwave-frequencies, with particular reference to the effects of concern to man. Such guidance is needed in the formulation and appraisal of criteria and limits of human exposure to "non-ionizing" radiation, and in the planning and conduct of future research.

The original plans were to categorize and key the literature citations to the "outline of biological and clinical effects" (Chapter 1). This proved to be a much more difficult and time-consuming task than anticipated, and was actually completed only for about 400 papers. Thus, the letter-number combinations given in square brackets for some of the "A" through "C" citations refer to the outline. [NV] indicates the citation was "not verified".

The standard format used throughout the bibliography is: author, (date), journal, volume, (issue): page, "title". The authors are alphabetized, and in chronological order. Multiple authors are also alphabetically ordered according to the second, third, etc., author. Inclusive pagination is given where possible, as is the original language of the citation. Report accession and translation numbers (some of which are cited in Appendix A), and alternate sources are listed when known. The title of books is underlined. When the title of the report was not available (or not given), a short (one line) description of the paper is listed whenever possible. Reports in which the name of the author was not given are listed chronologically using the format, "title", reference, source, (date). In many cases the citation was obtained from secondary (and tertiary) sources. For this reason it was impossible to put every citation into a consistent format.

In a few cases, papers have been cited which were presented at symposia or meetings devoted to the present topic, even when the report title suggests that it does not pertain directly to the topic. This has been done to show the wide range of items considered relevant (at least at the time of the meeting, and by the organizing chairman) in past years. An example is "electroanesthesia".

A few citations of marginal and/or peripheral relationship have also been included so that the reader may judge the applicability to his individual research needs. Examples are reports dealing with the biological effects of static and alternating magnetic fields, experimental techniques using radio frequency and microwave radiation (e.g., electron spin resonance, and nuclear magnetic resonance spectroscopy), and microwave exposure limits, regulations, and standards.

References for a few limited-distribution government reports are available upon request.



The author welcomes information which will correct errors and omissions (both of which no doubt exist). Copies of new papers would be greatly appreciated, and would encourage updating and revising the bibliography periodically.

#### ACKNOWLEDGMENTS

The assistance and support received during the preparation of this bibliography have been considerable, and I am happy to acknowledge my indebtedness and gratitude. Drs. John Keesey and Dennis Heffner, former and present Heads of the Biophysics Division, and Dr. Seymour Friess, Director of the Environmental Biosciences Department of the Naval Medical Research Institute, permitted me the opportunity to work on the bibliography, and offered frequent encouragement.

Acknowledgment is also due to many friends and associates for their helpful suggestions, comments, and loans and/or gifts of reports or other material, which have been invaluable in the course of the work. Mr. Glenn Heimer of the Naval Ship Engineering Center contributed an extensive collection of government reports and documents, many of which had not previously been cited in the open literature.

Special help in tracing and in the acquisition of relevant papers has been received from the librarians and staff members of the NMRI library: Mrs. Thelma Robinson, Mrs. Ernestine Gendleman, Mrs. Eleanor Capps, and Miss Deborah Grove. Their diligence and resourcefulness in tracing and obtaining copies of a large number of papers and reports, often in spite of incomplete and/or inaccurate citations given in other sources, enabled me to include many relevant items in the bibliography.

Mr. Christopher Dodge of the Scientific and Technical Center, Department of the Navy, provided much of the Soviet Bloc literature, linguistic and other technical assistance, and in addition offered valuable comments and encouragement throughout the preparation of this report. Especially noteworthy were the corrections and improvements suggested by Chris following his reading of the entire manuscript.

Helpful also in locating some of the Soviet literature was Mr. E. S. Serebrennikov, of the Science and Technology Division, The Library of Congress.

Credit is due Mrs. Anna Woke (of this Institute) for translating many of the German papers; to Dr. Emilio Weiss, who translated from the Italian, and to Mrs. Edith Pugh who typed many "first drafts"; also to Mrs. Rhoda Glaser for her help in many aspects of the work.

Mrs. Fannie Epstein deserves special mention for her outstanding editorial assistance, and especially for the heroic typing, organization, and checking of the entire report.

The Outline of Reported Biological Phenomena ('Effects') and Clinical Manifestations Attributed to Microwave and Radio-Frequency Radiation, is patterned after that given by R. Murray, et al., in an article entitled, "How safe are microwaves", which appeared in Non-Ionizing Radiation 1(1):7-8 (1969). Some of the "effects" were listed in the report by S. F. Cleary and W. T. Ham, Jr., entitled, "Considerations in the evaluation of the biological effects on exposure to microwave radiation", (Background document, Part I, 1969, for the Task Force on Research Planning in Environmental Health, Subtask Force on Physical Factors in the Environment). The discussion and suggestions offered by Byron McLees, Edward Finch, Lewis Gershman, and Christopher Dodge relating to the Outline are also gratefully acknowledged.

Preparation of the bibliography was supported by the Bureau of Medicine and Surgery, Department of the Navy, under work unit MF12.524. 015-0094B.

## CHAPTER 1

### Reported Biological Phenomena ("Effects") and Some Clinical Manifestations Attributed to Microwave and Radio-Frequency Radiation (See Note)

#### A. Heating of Organs\* (Applications: Diathermy, Electrosurgery, Electro- coagulation, Electrodesiccation, Electrotomy)

1. Whole Body (temperature regulation defects), Hyperpyrexia
  2. Skin
  3. Bone and Bone Marrow
  4. (a) Lens of Eye (cataractous lesions - due to the avascular nature of the lens which prevents adequate heat dissipation.)  
(b) Corneal damage also possible at extremely high frequencies.
  5. Genitalia (tubular degeneration of testicles)
  6. Brain
  7. Sinuses
  8. Metal Implants (burns near hip pins, etc.)
- The effects are generally reversible except for 4a.

#### B. Changes in Physiologic Function

1. Striated Muscle Contraction
2. Alteration of Diameter of Blood Vessels (increased vascular elasticity), Dilation
3. Changes in the Oxidative Processes in Tissues and Organs
4. Liver Enlargement
5. Altered Sensitivity to Drug Stimuli
6. Decreased Spermatogenesis (decreased fertility, to sterility)
7. Altered Sex Ratio of Births (more girls!)
8. Altered Menstrual Activity
9. Altered Fetal Development
10. Decreased Lactation in Nursing Mothers
11. Reduction in Diuresis ( $\text{Ca}^+$  excretion, via urine output)
12. Altered Renal Function (decreased filtration by tubules)
13. Changes in Conditioned Reflexes
14. Decreased Electrical Resistance of Skin
15. Changes in the Structure of Skin Receptors of the (a) Digestive,  
and (b) Blood-Carrying Systems
16. Altered Blood Flow Rate

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\* It is also reported that low levels of irradiation produce a cooling effect - "hypercompensation".

Note: These effects are listed without comment or endorsement since the literature abounds with conflicting reports. In some cases the basis for reporting an "effect" was a single or a non-statistical observation which may have been drawn from a poorly conceived (and poorly executed) experiment.

17. Alterations in the Biocurrents (EEG?) of the Cerebral Cortex (in animals)
18. Changes in the Rate of Clearance of Tagged Ions from Tissue
19. Reversible Structural Changes in the Cerebral Cortex and the Diencephalon
20. Electrocardiographic (EKG) Changes
21. Alterations in Sensitivity to Light, Sound, and Olfactory Stimuli
22. Functional (a) and Pathological (b) Changes in the Eyes:  
(a) decrease in size of blind spot, altered color recognition, changes in intraocular pressure, lacrimation, trembling of eyelids; (b) lens opacity and coagulation, altered tissue respiration, and altered reduction-oxidation processes
23. Myocardial Necrosis
24. Hemorrhage in Lungs, Liver, Gut, and Brain
25. Generalized Degeneration of all Body Tissue
26. Loss of Anatomical Parts
27. Death
28. Dehydration
29. Altered Rate of Calcification of Certain Tissue

} At Fatal Levels  
} of Radiation

**C. Central Nervous System Effects**

1. Headaches
2. Insomnia
3. Restlessness (Awake and During Sleep)
4. Electroencephalographic (EEG) Changes
5. Cranial Nerve Disorders
6. Pyramidal Tract Lesions
7. Conditioned Reflex Disorders
8. Vagomimetic Action of the Heart; Sympathomimetic Action
9. Seizures, Convulsions

**D. Autonomic Nervous System Effects**

1. Neuro-vegetative Disorders (e.g., alteration of heart rhythm)
2. Fatigue
3. Structural Alterations in the Synapses of the Vagus Nerve
4. Stimulation of Parasympathetic Nervous System (Bradycardia), and Inhibition of the Sympathetic Nervous System

**E. Peripheral Nervous System Effects**

Effects on Locomotor Nerves

F. Psychological Disorders ("Human Behavioral Studies") - the so-called "Psychophysilogic (and Psychosomatic) Responses"

1. Neurasthenia - (general "bad" feeling)
2. Depression
3. Impotence
4. Anxiety
5. Lack of Concentration
6. Hypochondria
7. Dizziness
8. Hallucinations
9. Sleepiness
10. Insomnia
11. Increased Irritability
12. Decreased Appetite
13. Loss of Memory
14. Scalp Sensations
15. Increased Fatigability
16. Chest Pain
17. Tremor of the Hands

G. Behavioral Changes (Animal Studies)

Reflexive, Operant, Avoidance, and Discrimination Behaviors

ii. Blood Disorders

(V = in vivo)  
(v = in vitro)

Changes in:

1. Blood and Bone Marrow
2. Phagocytic (polymorphs) and Bactericidal functions of blood (v)
3. Hemolysis rate (increase), (a shortened lifespan of cells)
4. Sedimentation rate (increase), (due to changes in serum protein levels or amount of fibrinogen. (?)
5. Number of Erythrocytes (decrease), also number of lymphocytes
6. Blood Glucose Concentration (increase)
7. Blood Histamine Content
8. Cholesterol and Lipids
9. Gamma (also  $\alpha$  and  $\beta$ ) Globulin, and Total Protein Concentration
10. Number of Eosinophils
11. Albumin/Globulin Ratio (decrease)
12. Hemopoiesis (rate of formation of blood corpuscles)
13. Leukopenia (increase in number of white cells), and Leukocytosis
14. Erythrocytosis

I. Vascular Disorders

1. Thrombosis
2. Hypertension

## J. Enzyme and Other Biochemical Changes

### Changes in activity of:

1. Cholinesterase (V,v)
2. Phosphatase (v)
3. Transaminase (v)
4. Amylase (v)
5. Carboxydismutase
  
6. Protein Denaturation
7. Toxin, Fungus, and Virus Inactivation (at high radiation dose levels), Bacteriostatic Effect
8. Tissue Cultures Killed
9. Alteration in Rate of Cell Division
10. Increased Concentration of RNA in Lymphocytes, and Decreased Concentration in Brain, Liver, and Spleen
11. Changes in Pyruvic Acid, Lactic Acid, and Creatinine Excretions
12. Change in Concentration of Glycogen in Liver (Hyperglycemia)
13. Alteration in Concentration of 17- Ketosteroids in Urine

## K. Metabolic Disorders

1. Glycosuria (sugar in urine; related with blood sugar?)
2. Increase in Urinary Phenol (derivatives? DOPA?)
3. Alteration of Rate of Metabolic Enzymatic Processes
4. Altered Carbohydrate Metabolism

## L. Gastro-Intestinal Disorders

1. Anorexia (loss of appetite)
2. Epigastric Pain
3. Constipation
4. Altered Secretion of Stomach "Digestive Juices"

## M. Endocrine Gland Changes

1. Altered Pituitary Function
2. Hyperthyroidism
3. Thyroid Enlargement
4. Increased Uptake of Radioactive Iodine by Thyroid Gland
5. Altered Adrenal Cortex Activity
6. Decreased Corticosteroids in Blood
7. Decreased Glucocorticoidal Activity
8. Hypogonadism (usually decreased testosterone production)

## N. Histological Changes

1. Changes in Tubular Epithelium of Testicles
2. Cross Changes

O. Genetic and Chromosomal Changes

1. Chromosome Aberrations (e.g., linear shortening, pseudochiasm, diploid structures, amitotic division, bridging, "sticky" chromosomes, irregularities in chromosomal envelope)
2. Mutations
3. Mongolism
4. Somatic Alterations (changes in cell not involving nucleus or chromosomes, cellular transformation)
5. Neoplastic Diseases (e.g., tumors)

P. Pearl Chain Effect (Intracellular orientation of subcellular particles, and orientation of cellular and other (non-biologic) particles)

Also, orientation of animals, birds, and fish in electromagnetic fields

Q. Miscellaneous Effects

1. Sparking between dental fillings
2. Peculiar metallic taste in mouth
3. Changes in Optical Activity of Colloidal Solutions
4. Treatment for Syphilis, Poliomyelitis, Skin Diseases
5. Loss of Hair
6. Brittleness of Hair
7. Sensations of Buzzing Vibrations, Pulsations, and Tickling About the Head and Ears
8. Copious Perspiration, Salivation, and Protrusion of Tongue
9. Changes in the Operation of Implanted Cardiac Pacemakers
10. Changes in Circadian Rhythms

# Sunday, February 1, 2015

## Health Experts Caution About Smart Meters

"[Health Experts Caution About Smart Meters](#)" (9/12/2012), one of my most popular press releases, publicized an open letter that discusses why precaution is warranted with regard to adoption of wireless smart meters. The letter which was signed by 54 scientists and medical professionals was originally published by *La Maison du 21e siecle*. The letter is reprinted below.

Smart Meters: Correcting the Gross Misinformation

*La Maison du 21e siecle*, June 11, 2012

Quebec-based magazine [La Maison du 21e siecle](#) asked physician [David O. Carpenter](#), former founding dean of the University at Albany (NY)'s School of Public Health, to comment on an open letter published in the Montreal daily *Le Devoir* on May 24 2012. This letter claimed wireless smart meters pose no risk to public health. More than fifty international experts endorsed the following rebuttal.

Dr David O. Carpenter, founder, University at Albany (NY) School of Public Health

We, the undersigned are a group of scientists and health professionals who together have coauthored hundreds of peer-reviewed studies on the health effects of electromagnetic fields (EMFs). We wish to correct some of the gross misinformation found in the [letter regarding wireless "smart" meters that was published in the Montreal daily Le Devoir on May 24](#). Submitted by a group [Quebec engineers, physicists and chemists](#), the letter in question reflects an obvious lack of understanding of the science behind the health impacts of the radiofrequency (RF)/microwave EMFs emitted by these meters.

The statement that « Thousands of studies, both epidemiological and experimental in humans, show no increase in cancer cases as a result of exposure to radio waves of low intensity... » is [false \(1\)](#). In fact, [only a few such studies — two dozen case-control studies of mobile phone use](#), certainly not thousands, have reported no elevations of cancer, and most were funded by the wireless industry. In addition, these reassuring studies contained significant experimental design flaws, mainly the fact that the populations followed were too small and were followed for a too short period of time.

Non industry-funded studies have clearly demonstrated a significant increase in cancer cases among individuals who have suffered from prolonged exposure to low-level microwaves, transmitted notably by radio antennas. The effects were best documented in meta-analyses that have been published and that include grouped results from several different studies: [these analyses](#) consistently showed an [increased risk of brain cancer](#) among regular users of a cell phone who have been exposed to microwaves [for at least ten years](#). Children and youths are especially vulnerable (2). For example, the [2009 Hardell-Carlberg study](#) reported a consistent association between use of mobile or cordless phones and two types of head tumors, astrocytoma grade I-IV and acoustic neuroma. The authors »found an especially high risk for persons that started use of mobile or cordless phones before the age of 20 years, although based on low numbers «.

## Brain Cancer Rates

Furthermore, the argument that brain cancer rates do not indicate an overall increase in incidence is not evidence that cell phones are safe: the latency for brain cancer in adults after environmental exposure can be long, up to 20-30 years. Most North Americans haven't used cell phones extensively for that long. The evidence of the link between long-term cell phone use and brain cancer comes primarily from Northern Europe, where cell phones have



been commonly used since the 1990s. Nevertheless, the [most recent collection of primary brain tumors mined from pathology units in Australia](#) showed brain cancer incidence rose by about 35% between 2000 and 2008 in the Australian Capital Territory and New South Wales (total population : more than 7 million).

In May 2011, after reviewing the published scientific literature regarding cancers affecting cell phone users, [the International Agency for Research on Cancer \(IARC\) classified radiofrequency radiation as a 2B, possible human carcinogen](#). Despite the absence of scientific consensus, the evidence is sufficiently compelling for any cautious parent to want to reduce their loved one's exposure to RF/microwave emissions as much as possible, as recommended by [various countries](#) such as Austria, Belgium, [Germany](#), [Russia](#) and the [United Kingdom](#).

## **Electrosensitivity**

Public fears about wireless smart meters are well-founded. They are backed by various medical authorities such as those of the [Santa Cruz County](#)(California) Public Health Department. These authorities are worried about the growing number of citizens who say they have developed [electrohypersensitivity](#) (EHS), especially since for many of them, the symptoms developed after the installation of such meters (it takes some time for most people to link the two events).

Since the turn of the millennium, people are increasingly affected by ambient microwaves due to the growing popularity of wireless devices such as cell phones and Wi-Fi Internet. Therefore, the mass deployment of smart grids could expose large chunks of the general population to alarming risk scenarios without their consent. According to [seven surveys done in six European countries between 2002 and 2004, about 10% of Europeans have become electrosensitive](#). The most famous person to [publicly reveal her electrosensitivity is Gro Harlem Brundtland](#), formerly Prime Minister of Norway and retired Director of the World Health Organization (WHO).

[While there is no consensus on the origins and mechanisms of EHS](#), many [physicians and other specialists around the world](#) have become aware that EHS symptoms (neurological dermatological, acoustical, etc.) seem to be triggered by exposure to EMF levels well below current international exposure limits, which are established solely on short-term thermal effects (3). Organizations such as the [Austrian Medical Association](#) and the [American Academy of Environmental Medicine](#) have recognized that the ideal way to treat of EHS is to reduce EMF exposure.

Therefore, caution is warranted because the growing variety of RF/microwave emissions produced by many wireless devices such as smart meters have never been tested for their potential biological effects.

## **Well-known bioeffects**

While the specific pathways to cancer are not fully understood, it is scientifically unacceptable to deny the weight of the evidence regarding the increase in cancer cases in humans that are exposed to high levels of RF/microwave radiation.

The statement that « there is no established mechanism by which a radio wave could induce an adverse effect on human tissue other than by heating » is incorrect, and reflects a lack of awareness and understanding of the scientific literature on the subject. In fact, [more than a thousand studies](#) done on low intensity, high frequency, non-ionizing radiation, going back at least fifty years, show that some biological mechanisms of effect do not involve heat. This radiation sends signals to living tissue that stimulate biochemical changes, which can generate various

symptoms and may lead to diseases such as cancer.

Even though RF/microwaves don't have the energy to directly break chemical bonds, unlike ionizing radiation such as X-rays, there is scientific evidence that this energy can cause DNA damage indirectly leading to cancer by a combination of biological effects. [Recent publications](#) have documented the generation of free radicals, [increased permeability of the blood brain barrier](#) allowing potentially toxic chemicals to enter the brain, induction of genes, as well as altered electrical and metabolic activity in human brains upon application of cell phone RF/microwaves similar to those produced by smart meters.

These effects are cumulative and depend on many factors including RF/microwave levels, frequency, waveform, exposure time, biovariability between individuals and combination with other toxic agents. Clear evidence that these microwaves are indeed bioactive has been shown by the fact that low-intensity EMFs have proven clinically useful in some circumstances. Pulsed EMFs have long been used to successfully [treat bone fractures](#) that are resistant to other forms of therapy. More recently, frequency-specific, amplitude-modulated EMFs have been found useful to treat [advanced carcinoma](#) and chronic pain.

High frequency EMFs such as the microwaves used in cell phones, smart meters, Wi-Fi and cordless "DECT" phones, appear to be the most damaging when used commonly. Most of their biological effects, including symptoms of electrohypersensitivity, can be seen in the damage done to cellular membranes by the [loss of structurally-important calcium ions](#). Prolonged exposure to these high frequencies may eventually lead to cellular malfunction and death.

Furthermore, malfunction of the parathyroid gland, located in the neck just inches from where one holds a cell phone, may actually cause electrohypersensitivity in some people by reducing the background level of calcium ions in the blood. RF/microwave radiation is also known to [decrease the production of melatonin](#), which protects against cancer, and to [promote the growth of existing cancer cells](#).

### **Early warning scientists attacked**

In recommending that the Precautionary Principle be applied in EMF matters, the European Environment Agency's Director [Jacqueline McGlade wrote in 2009](#): "We have noted from previous health hazard histories such as that of lead in petrol, and methyl mercury, that 'early warning' scientists frequently suffer from discrimination, from loss of research funds, and from unduly personal attacks on their scientific integrity. It would be surprising if this is not already a feature of the present EMF controversy... » Such unfortunate consequences have indeed occurred.

The statement in the *Le Devoir* letter that « if we consider that a debate should take place, it should focus exclusively on the effects of cell phones on health » is basically an acknowledgement that there is at least some reason to be concerned about cell phones. However, while the immediate exposure from a cell phone is of much greater intensity than the exposure from smart meters, cell phone use is temporary.

### **Smart meters**

[As Australian Associate Professor of neurosurgery Vini G. Khurana reports](#), adverse neurological effects have been reported in people who sustain close proximity to wireless meters, especially under 10 feet (3 metres).

A wireless smart meter produces radiofrequency microwave radiation with two antennas in approximately the same frequency range (900 MHz to 2.4 GHz) as a typical cell tower. But, depending on how close it is to occupied space

within a home, a smart meter can cause much higher RF exposures than cell towers commonly do. If a smart meter is located on a common wall with a bedroom or kitchen rather than a garage wall, for example, the RF exposure can be the same as being within 200 to 600 feet distance of a cell tower with multiple carriers. With both cell towers and smart meters, the entire body is immersed by microwaves that go out in all directions, which increases the risk of overexposure to many sensitive organs such as the eyes and testicles. With a cell phone, people are exposed to microwaves primarily in the head and neck (unless using speaker mode), and [only when the device is turned on or in standby mode](#).

Wireless smart meters typically produce atypical, relatively potent and very short pulsed RF/microwaves whose biological effects have never been fully tested. They emit these millisecond-long RF bursts on average 9,600 times a day with a maximum of 190,000 daily transmissions and a peak level emission two and a half times higher than the stated safety signal, as the California utility [Pacific Gas & Electric recognized](#) before that State's Public Utilities Commission. Thus people in proximity to a smart meter are at risk of significantly greater aggregate of RF/microwave exposure than with a cell phone, not to mention the cumulative exposure received by people living near multiple meters mounted together, pole-mounted routers or utility collector meters using a third antenna to relay RF signals from 500 to 5,000 homes.

[A technical study performed by Sage Associates](#) in California indicates that RF levels from various scenarios depicting normal smart meter installation and operation may violate even the out-of-date US public safety standards which only consider acute thermal effects. This can happen when a person stands close to the meter to read the power consumption, or touches it, or shades the meter face with a hand to better read it. Emissions are also increased by reflective materials, such as stainless steel, other metals and mirrors, which can re-radiate stronger than the otherwise unaltered background. Microwaves are absorbed and dissipated by partially conductive materials, such as cement and special RF shielding paints and fabrics.

In addition to the erratic bursts of modulated microwaves emitted by wireless smart meters transferring usage data to electric, gas and water utilities, wireless as well as wired smart (powerline communication) meters are also a [major source](#) of "dirty electricity" (electrical interference of high frequency voltage transients typically of kilohertz frequencies). Some scientists, such as [American epidemiologist Sam Milham](#), believe that many of the health complaints about smart meters may also be caused by dirty electricity generated by the « switching » power supply activating all smart meters. Since the [installation of filters to reduce dirty electricity](#) circulating on house wiring has been found to relieve symptoms of EHS in some people, this method should be considered among the priorities aimed at reducing potential adverse impacts. Indeed, the Salzburg State (Austria) Public Health Department confirms its concern about the potential public health risk when in coming years almost every electric wire and device will emit such transient electric fields in the kilohertz-range due to wired smart meters.

### **Rather be safe than sorry**

The apparent adverse health effects noted with smart meter exposure are likely to be further exacerbated if smart appliances that use wireless communications become the norm and further increase unwarranted exposure.

To date, there have been few independent studies of the health effects of such sources of more continuous but lower intensity microwaves. However, we know after decades of studies of hazardous chemical substances, that chronic exposure to low concentrations of microwaves can cause equal or even greater harm than an acute exposure to high concentrations of the same microwaves.

This is why so many scientists and medical experts urgently recommend that measures following the Precautionary Principle be applied immediately — such as using wired meters — to reduce biologically inappropriate microwave exposure. We are not advocating the abolishment of RF technologies, only the use of common sense and the development and implementation of best practices in using these technologies in order to reduce exposure and risk of health hazards.

(1) • [Scientific papers on EMF health effects](#)

(2) On Nov. 19 2012, we struck from this letter an error propagated in the media claiming that « In May 2012, the U.K.'s Office of National Statistics reported a 50 percent increase in incidence of frontal and temporal lobe tumors in children between 1999 and 2009. »

(3) [Explanation and studies on electrosensitivity](#)

(4) [Governments and organizations that ban or warn against wireless technology](#)

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<http://stopsmartmeters.org.uk/www-scribd-comdoc79928679the-who-iarc-listing-of-rfr-as-a-possible-human-carcinogen/>

Email from Dr Robert Baan, the principal author of the 2011 IARC Monograph on the carcinogenicity of radiofrequency radiation, in which he interprets the 2B classification of RFR as applicable to all form of RFR exposures, including Smart Meters and Wi-Fi:

*Subject: EMF Class 2B Classification*

*Dear Dr Hudson,*

*Thank you for your message, which was forwarded to me, and to which I would like to respond as follows. The IARC Working Group classified “Radiofrequency Electromagnetic Fields” (RF-EMF) as possibly carcinogenic to humans (Group 2B). The information that formed the main basis for this evaluation was found in epidemiological studies on cell-phone use, where a slightly increased risk for glioma (a malignant form of brain cancer) and acoustic neuroma (a non-cancerous type) was reported among heavy users. There were some indications of increased cancer among radar-maintenance workers (occupational exposure), but no reliable data from studies among, e.g., people living close to base-station antennas, radio/TV towers, etc (environmental exposure). Although the key information came from mobile telephone use, the Working Group considered that the three types of exposure entail basically the same type of radiation, and decided to make an overall evaluation on RF-EMF, covering the whole radiofrequency region of the electromagnetic spectrum. In support of this, information from studies with experimental animals showed that effects on cancer incidence and cancer latency were seen with exposures to different frequencies within the RF region. So the classification 2B, possibly carcinogenic, holds for all types of radiation within the radio frequency part of the electromagnetic spectrum, including the radiation emitted by base-station antennas, radio/TV towers, radar, Wi-Fi, smart meters, etc. An important point is the radiation level. The exposure from cellular phones (personal exposure) is substantially higher and much more focused (usually on the brain) than exposures from radio/tv towers, antennas, or Wi-Fi. I hope this is useful. Thank you for your interest in our work.*

*Sincerely yours,*

*Robert A Baan PhD The IARC Monographs IARC, Lyon, FRANCE*

<http://www.sfgate.com/news/article/E-mails-show-back-channel-talks-between-CPUC-PG-E-6052838.php>

# E-mails show back-channel talks between CPUC, PG&E

By [Jaxon Van Derbeken](#) Updated 10:23 pm, Friday, January 30, 2015



Photo: Jeff Chiu, Associated Press

**California Public Utilities Commission President Michael Peevey laughs during a meeting of the five-member commission in San Francisco, Thursday, Dec. 18, 2014. (AP Photo/Jeff Chiu)**

A top official with the California Public Utilities Commission offered to help Pacific Gas and Electric Co. subvert rules intended to prevent backroom deals in regulatory cases, e-mails that the company released Friday show.

Such undisclosed talks are at the heart of controversies that have beset the regulatory agency in recent months, including an instance in which commission officials offered to satisfy a since-fired PG&E vice president who wanted his preferred judge named to oversee a \$1.3 billion rate-setting case in early 2014.

The disclosures have staggered an agency that was already reeling from criticism of how it oversaw PG&E before a company [pipeline exploded in San Bruno in 2010](#), killing eight people and destroying 38 homes. The agency's longtime president and executive director have left since November, and state and federal investigators have opened probes into whether laws were broken, based in part on the e-mails.

On Friday, PG&E released an e-mail that the head of the utilities commission's energy division, Julie Fitch, sent to a company vice president who was involved in the judge-shopping case. It was part of a cache of [65,000 e-mail communications](#) dating back to 2010 between state regulators and PG&E officials that the utility released in response to a court case filed by the city of San Bruno.

The newly disclosed e-mail from Fitch indicates that back-channel talks — also known as *ex parte* communications — between the state agency and PG&E were happening well before the judge-shopping case unfolded last year.

## Smart meters

Fitch sent the e-mail on Jan. 4, 2011, as the commission was grappling with whether to allow PG&E customers an opportunity to opt out from having smart meters installed at their homes. Such meters had raised health



concerns among some customers.

PG&E opposed the opt-out plan. The commission's then-president, Michael Peevey, "was skeptical" about "offering the opt out itself, and how," Fitch wrote to then-PG&E Vice President Brian Cherry.

"Would be good to have a substantive discussion with him," Fitch continued, "if you can do it without invoking some kind of ex parte reporting.

"I'm not sure where this would stand, procedurally," Fitch added. "If it's easier, I can be the intermediary to avoid your needing to file something saying you went to talk to Peevey about smart meter options."

Earlier, in September 2010, Fitch had e-mailed Cherry and his boss to warn that the opt-out idea was gathering momentum.

"We are worried this could get out of hand if we don't get our story straight about this," she wrote. "We are actually trying to figure out how to prevent it, or at least figure out a way to have a consistent story about what the real costs would be."

It is unclear what happened after the e-mails were written, but the commission ultimately approved opt-out provisions for customers who would have to pay for the privilege.

Fitch could not be reached for comment late Friday.

Britt Strottman, an attorney for the city of San Bruno, said Fitch's e-mail offering to help PG&E avoid reporting back-channel talks was an assault on rules designed to protect all parties in regulatory cases.

"This e-mail shows that a top CPUC employee was doing something indirectly that you can't do directly under the law," Strottman said. "It's unethical and gives PG&E an unfair advantage."

Mark Toney, executive of the ratepayer advocacy group The Utility Reform Network, or TURN, said the e-mail should prompt an investigation into whether any improper communication influenced the outcome of the smart meter case.

### **Rules need reforming**

"PUC staff should never offer to help utilities get around the ex parte rules," he said. "This is why the ex parte rules need to be reformed and tightened up. Because billions of dollars of ratepayer money is at stake."

The utilities commission issued a general statement after the e-mails were released Friday, saying it was committed to "transparency and fairness" and will train its employees to uphold the "professionalism that the CPUC's role as regulators ... requires."

"As the CPUC reviews the e-mails, if it is discovered that any employee engaged in a practice that appears inconsistent with CPUC rules or state law, a further fact-finding will take place and appropriate corrective action, if needed, will be taken," the statement said.

PG&E spokesman Keith Stephens said releasing the e-mails was "the right thing to do and reflects our sincere commitment to transparency and our own high ethical standards."

"We want to be very clear, while we make no excuses for past instances of unethical conduct, we have a vital responsibility to communicate with the CPUC on a regular basis as part of our public commitment to becoming the safest gas company in America," Stephens said.

The steady release of e-mails showing back-channel talks is battering the utilities commission's credibility. Earlier e-mails showed Carol Brown, then Peevey's chief of staff, advising another top PG&E official about how to get around a public request for information in the San Bruno case. The PG&E official replied to that advice, "Love you."

Other e-mails showed Brown offering to help Cherry in the \$1.3 billion rate case, which will determine how much PG&E customers must pay for pipeline improvements that the company undertook after the San Bruno disaster.


E-mails also showed that Commissioner Mike Florio told Cherry, "I'll do what I can" to "bump" a judge the company didn't want on the case.

Florio later apologized for "very serious mistakes" and said he hadn't been aware of utilities commission rules

against back-channel communications with the companies it regulates, an assertion that astounded many who knew him from his 30 years as an attorney for TURN.

The fallout from the revelations has been severe. Cherry, his boss and another PG&E executive were fired, and an administrative law judge told the company it could face millions of dollars in fines.

Peevey, the commission's president since 2002, opted not to seek another six-year term in December from Gov. Jerry Brown. This week, agents with state Attorney General Kamala Harris' office seized computers and other items both from his Los Angeles-area home and Cherry's Orinda residence.

*Jaxon Van Derbeken is a San Francisco Chronicle staff writer. E-mail:* 

### **Released e-mails**

All the e-mails released Friday involving communications between the California Public Utilities Commission and PG&E may be read at:

<ftp://ftp2.cpuc.ca.gov/PG&E20150130ResponseToA1312012Ruling>

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