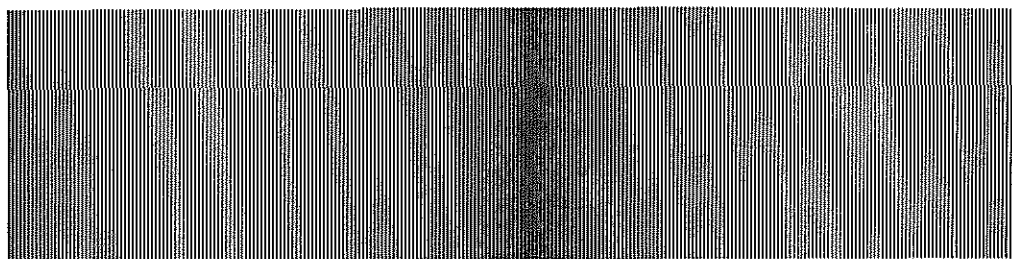


# MICRO WAVE NEWS



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A Report on Non-Ionizing Radiation

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## Cellular Telephone Radiation Blamed for Brain Tumor

In the first case of its kind, NEC America Inc. and GTE Mobilnet of Tampa Inc. have been sued over allegations that the use of a cellular phone caused or promoted the development of a woman's brain tumor.

In a complaint filed April 8 in the Circuit Court for Pinellas County, FL, Susan Reynard and her family charged that, "The tumor was the result of radiation emitted by a cellular telephone [or] the course of the tumor was accelerated and aggravated by the emissions from the telephone..."

Susan Reynard used an NEC P9000 hand-held cellular phone for two years prior to being diagnosed with a malignant left parietal tumor in May of 1990, according to her husband, David Reynard. He explained that the first sign of his wife's illness came about a year before the diagnosis of cancer, when she had some loss of peripheral vision in her right eye. At that time, doctors examining a magnetic resonance imaging (MRI) scan found what they thought was a small lesion, which they took to be evidence of a mild stroke. A year later, a second MRI showed a tumor at the same location. Susan Reynard died late in May 1992.

She had "made regular and frequent use of the cellular phone," according to her attorney, John Lloyd Jr. of St. Petersburg, FL. He added that he is still examining phone company and other records to document the extent and

(continued on p.10)

## Human and Cellular Studies Point to Similar Mutagenic Effects of Radar

Epidemiological and laboratory studies point to similar genetic effects from exposure to microwave radiation, according to a series of studies carried out by researchers at the University of Zagreb in Croatia.

"We found the same type of chromosomal abnormalities among workers exposed to radar radiation and in cells exposed in vitro," Dr. Vera Garaj-Vrhovac of the Laboratory for Mutagenesis at the university's Institute for Medical Research and Occupational Health told *Microwave News*.

The Croatian work is the strongest evidence to date pointing to a mutagenic effect of high frequency radiation. There have been relatively few studies of chromosomal changes due to electromagnetic radiation and the few that have been carried out have shown conflicting results (see, for example, *MWN*, J/A87 and N/D91).

Since 1984, the institute's Dr. Jasminka Goldoni has been monitoring the health of 40 workers who maintain air traffic control radar in Zagreb. Over the years, she and her coworkers have documented changes in their eyes and

(continued on p.11)

## « Power Line Talk »

The results of two major Swedish epidemiological studies will be announced in Stockholm on September 30, according to Rolf Lindgren of the Swedish State Power Board. The meeting is being organized by the principal sponsor of the studies, the Swedish National Board for Industrial and Technical Development, known as NUTEK. (The Swedish National Energy Administration is part of NUTEK.) Dr. Anders Ahlbom of the Institute of Environmental Medicine at the Karolinska Institute in Stockholm will present the findings of his case-control study of adult and childhood cancers and residential exposures to EMFs (see *MWN*, M/J87 and N/D89). And Dr. Birgitta Floderus of the National Institute of Occupational Health in Solna will present the results of her study of leukemia and brain tumors among EMF-exposed workers (see *MWN*, N/D89). Lindgren also reports that a small number of individuals will be briefed on the results on September 18 to give them an opportunity "to prepare statements and alert people in key positions." Both Ahlbom and Floderus are expected to report some data at the *1st World Conference for Electricity and Magnetism in Biology and Medicine* in Orlando, FL in mid-June and to present the final results at the DOE review in San Diego, CA in November.

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Last August, Congress asked the National Academy of Sciences-National Research Council (NAS-NRC) for a review of ELF health effects and allocated \$600,000 for the study (see *MWN*, S/O91). But work on this project has yet to begin. As of mid-May, the DOE (the conduit for the funds in its role as lead agency for EMF research) has not entered into a contract for the study. "It's still going through the DOE process," Dr. Dennis Mahlum, the project officer at the NAS-NRC's Board on Radiation Effects Research, told *Microwave News*. Mahlum does not anticipate selecting a chairman or other panel members for the study until he has a signed contract.

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Particle physicist David Jackson has returned to the idea that a simple back-of-the-envelope calculation can end the controversy over EMF health effects. Writing in the April 1992 *Proceedings of the National Academy of Sciences*, Jackson argues that the link between ELF EMFs and cancer can be tested by comparing overall cancer mortality with the generation of electricity in the U.S. since 1900. And this comparison has led him to believe that "stray 50 or 60 Hz EMFs pose no significant hazard to the average individual." He adds that his conclusions "will not come as a surprise to scientists concerned with the issue." Maybe they are not surprised (the argument has been raised before, see *MWN*, J/F91 and J/A91), but several epidemiologists quoted in the media are not impressed either. "[T]here are so many things going on over that period—new drugs, new

treatments, new causes of cancer—that [Jackson's analysis] really doesn't tell us anything," Dr. David Savitz of the University of North Carolina told the *Los Angeles Times* (April 15). Dr. Richard Stevens of the Battelle Pacific Northwest Labs was more blunt: "This is a fatuous piece of work." Also quoted in the *Times*, Stevens allowed that Jackson's approach makes "intuitive sense" but added that with such reasoning, "you couldn't even show any significant effect of smoking on cancer...." A similar debate is ongoing in *The Health Physics Society's Newsletter*. The May issue includes a letter from Dr. Joseph Kirschvink criticizing Dr. Robert Adair's October 1991 article, which compared childhood leukemia rates in Connecticut with per capita power consumption. "Kirschvink misrepresents my paper and then attacks those misrepresentations," Adair wrote in a response in the same issue.

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In late March, Dr. Andrew Sivak resigned as the president of the Health Effects Institute (HEI). Dr. Charles Powers, the founder of the institute, is now serving as the acting president. The reasons for Sivak's departure are unclear, though there are indications that the board asked for his resignation. In an interview, Powers would only say that the board made no sudden decisions. HEI is continuing to assemble an EMF research plan, which is scheduled to be made public later this year (see *MWN*, S/O91, N/D91 and M/A92). "It's going to take a truly complex piece of detective work" to sort out EMF effects, Powers said.

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Women on Long Island, NY are pressing for federal funding to study the possible causes of high rates of breast cancer in the region—especially the potential role of EMFs. On May 8, EMFs came up at a congressional hearing, held on Long Island by Rep. James Scheuer (D-NY), which looked at the possible link between toxic chemicals and breast cancer. Three days later, a panel of experts from the federal Centers for Disease Control (CDC) in Atlanta, GA came to New York to listen to residents' concerns. But research money is uncertain. "My guess is that we probably won't recommend a study," Dr. Marion Nadel, a CDC epidemiologist, told *Microwave News*. A final decision is due in December. "The CDC has been dragging its feet for a long time," insisted Fran Kritchek, cochairwoman of the 1 in 9 Long Island Breast Cancer Action Coalition. "I hope the CDC and the state will confront the issue in a more aggressive manner." Dr. James Melius, director of the state health department's division of occupational health and environmental epidemiology, told *Microwave News* that breast cancer is "an issue that needs to be addressed." He said the department is examining air pollution and EMFs as possible risk factors. "Based on those results we will decide whether to conduct further studies."

But Melius said he didn't know if funds would be available. In the meantime, the community is impatient. "We can't afford to wait six months for the CDC to decide," said Barbara Balaban, director of the Breast Cancer Hotline & Support Program at the Adelphi University School of Social Work. "In six months there will be 23,000 more deaths and 90,000 more cases of breast cancer." ...Battelle's Dr. Richard Stevens and Dr. Scott Davis of the Fred Hutchinson Cancer Research Center in Seattle, WA have received funding, as expected, for a study of the influence of EMFs and/or light-at-night on breast cancer in women (see *MWN*, N/D91). The study began on May 1.

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Although the House of Representatives has voted to shift feder-

al EMF research authority from the DOE to the National Institute of Environmental Health Sciences (see below), the DOE is continuing its series of workshops to formulate a coordinated national research program by mid-summer. The first meeting, held on May 4-5 in Crystal City, VA, focused on policy issues. Participants included representatives of the NERP steering committee, APPA, EEI, FDA and the Florida DER. Dr. Richard Ball of DOE's Office of Domestic and International Energy Policy ran the meeting. The DOE has scheduled two more workshops—one on science and engineering in Arlington, VA on June 3-5, and the other on risk communications in Crystal City on June 8-9. In addition, the DOE is planning public hearings for June 29 and July 9 in Denver, CO and Philadelphia, PA, respectively. (See also, *MWN*, N/D91 and J/F92).

## House Taps NIEHS To Lead National EMF Research Effort

The House of Representatives has selected the National Institute of Environmental Health Sciences (NIEHS) as the lead federal agency for electromagnetic field (EMF) health effects research, replacing the Department of Energy (DOE).

Under legislation passed by the House on May 27, NIEHS will receive \$60 million for research and \$5 million for communications, both to be spread over five years. An interagency committee chaired by an NIEHS official will set the research agenda.

The EMF program is included in the national energy strategy bill, H.R. 776. The Senate version of the energy bill, approved earlier this year, does not contain any EMF provisions, and a joint House-Senate conference committee must resolve all differences between the two measures. Congressional leaders expect to enact the energy legislation this year.

In selecting NIEHS, the House rejected the DOE designation Congress made last year, according to an aide to the House Energy and Commerce Committee (see *MWN*, S/O91). NIEHS provides greater scientific credibility than the DOE, he explained. Committee staffers had met with officials from NIEHS, the DOE and the Environmental Protection Agency (EPA). "It was clear to everybody that NIEHS was the best choice," he said.

The EMF language approved by the House was a compromise between the Energy and Commerce Committee, which favored NIEHS, and the House Science, Space and Technology Committee. The science committee had named the DOE as the lead federal agency in EMF legislation it appended to H.R. 776 in March (see p.13 and *MWN*, N/D91, J/F92 and M/A92).

But Rep. George Brown (D-CA), chairman of the science committee and the primary congressional supporter of an expanded EMF research effort, said through a spokesman that he is "very supportive of the lead role of NIEHS." Except for the NIEHS designation, the EMF provisions in the energy bill are generally consistent with the original science committee bill.

Sources said that the DOE did not try to block the NIEHS selection, but those who track EMF legislation expect the department to fight to retain its lead role in the House-Senate conference. DOE officials did not respond to requests for comment.

NIEHS, based in Research Triangle Park, NC, supports biomedical research on the human health effects of biological, chemical and physical agents. It is part of the National Institutes of Health within the Department of Health and Human Services. Dr. Kenneth Olden, the director, was formerly director of the Howard University Cancer Center and chairman of the oncology department at Howard's medical school, both in Washington, DC.

## Dutch Advisory Panel Discounts ELF Health Risks

An advisory group in The Netherlands has concluded that there are not enough reliable data to support a link between the extremely low frequency (ELF) EMFs from power lines and appliances and the development of cancer, pregnancy problems or other health effects.

The ad hoc committee, set up by the Health Council of The Netherlands, recommended that standards be based on limiting the internal currents induced in the body by ELF EMFs—the approach adopted by the International Non-Ionizing Radiation Committee of the International Radiation Protection Association (see *MWN*, M/J89 and J/F90).

"Results of the epidemiological studies as are now available do not justify the conclusion that there exists a relation between prolonged domestic or professional exposure to ELF EMFs and adverse health effects," the committee wrote in a report released on April 8 in The Hague. The committee did recommend that "monitoring of the developments in this field be continued and the data reevaluated in five years."

The committee also found "no compelling reasons to determine in detail the ELF EMF strengths to which the Dutch population is exposed," because of the uncertainties over which char-

acteristics of the EMFs, if any, have an impact on health.

Dr. Eric van Rongen, the scientific secretary of the Health Council, explained to *Microwave News* that no decision has yet been made on whether a new review will be undertaken in five years. If such a review is approved, a new committee will be formed.

The seven-member Dutch committee was chaired by Dr. A. van Oosterom, a professor of medical physics at Catholic

University in Nijmegen.

The 94-page report, *Extreem Laagfrequente Elektromagnetische Velden en Gezondheid* (ELF EMFs and Health), Report 1992/07, is available for 32.50 Dfl (approximately \$16.00) from: Public Relations Department, Health Council of the Netherlands, PO Box 90517, 2509 LM The Hague, The Netherlands, (31+70) 347-1441. The report is in Dutch; an executive summary is available in English.

## Defining Prudent Avoidance Policies State by State

From Connecticut to California, states are grappling with prudent avoidance. An EMF study group in Connecticut has refused to endorse the policy, while a similar committee in Texas endorsed it but has recommended no changes in power line routing policies. Colorado has called for a hearing to define its program better. And Wisconsin has taken the lead in seeking to reduce public exposure to EMFs.

Current evidence "does not permit firm judgments about possible adverse effects of ELF magnetic fields on human health," the Connecticut Academy of Science and Engineering (CASE) wrote in its April 1 report. "It would be inappropriate...for public authorities to recommend 'prudent avoidance'," it concluded.

Connecticut Health Commissioner Susan Addiss told *Microwave News* that she agrees with CASE's report and that she supports the group's recommendations.

Texas' EMF Advisory Committee urged the state Public Utility Commission (PUC) to stick by its policy of prudent avoidance, but only up to a point. "We...recommend that, at this time, the PUC not expand existing routing criteria to include concerns regarding health effects of EMF exposures," the committee stated in a report, issued in March. Texas' policy since 1976 has been to avoid population centers, historical sites and existing utilities when siting transmission lines. "It was more for aesthetic reasons," PUC spokesman Mel Eckoff said in a telephone interview. "Concerns about health effects of EMFs might have been informally included over the years."

Earlier this year, the Wisconsin Public Service Commission (PSC) ordered utilities to use low EMF designs in new or upgraded transmission and distribution lines and to consider population exposure to EMFs when planning the lines (see *MWN*, J/F92). The PSC did not use the term "prudent avoidance" in its May 7 formal order because "it can mean many things to many people," PSC aide Dan Dasho told *Microwave News*. "But it would be fair to say that Wisconsin goes beyond commonly held perceptions of prudent avoidance," he added.

On May 11, the Colorado Supreme Court reversed a ruling by the Douglas County District Court that denied the Public Service Company's request to upgrade transmission lines. The Douglas County Board of County Commissioners filed a petition on May 26 requesting that the Supreme Court schedule a rehearing, according to the board's attorney, Steven Denman of the Denver firm of Sherman & Howard. The latest decision was

a victory for the state PUC, which had approved the upgrade in 1989 (see *MWN*, N/D89 and M/A91). At that time, the PUC affirmed that, "Prudent avoidance means the striking of a reasonable balance between avoiding potential harm and the attendant costs and risks." Following this policy, the PUC claimed that the costs outweighed the benefits of burying the Douglas County power lines.

Meanwhile, Colorado is moving forward with attempts to better define prudent avoidance. On April 29, the PUC proposed to open a hearing in August "to determine what standards should apply to electric and magnetic field strength when a utility...builds new, or upgrades existing, electrical facilities." One commissioner suggested adopting Florida's rules for EMF exposure (see *MWN*, M/A89).

Members of an EMF advisory group in California disagreed

### Prudent Avoidance Sought in Union Contract

Workers at Detroit Edison in Dearborn, MI are asking the utility to adopt a policy of prudent avoidance.

Local 223 of the Utility Workers Union of America (AFL-CIO) has proposed adding language to its contract specifying that Detroit Edison post warning signs indicating the strength of ambient EMFs, install physical barriers to prevent entry to areas "where EMFs exceed average levels typically found in homes," train workers in all aspects of recognizing and mitigating EMFs, assess typical worker exposures and, when planning or rebuilding power lines, favor designs that minimize EMF exposures.

"It's stunning how interest has picked up as the members learn about EMFs," the union's Hal Nixon told *Microwave News*. He explained that of the 440 Detroit Edison substation employees, three men lost children to leukemia and a fourth had a child born with a brain tumor—and there has been a general excess of leukemia among the workers themselves. There are some 2,900 Detroit Edison employees in the union.

Frank Agosti, a senior vice president at Detroit Edison, declined to discuss the union proposal. "It's our policy not to comment on contract negotiations," he said.

## Excerpts from the State Reports

### Colorado...

- Until scientific findings are more conclusive, facilities should be designed and located using methods to mitigate, to the extent practicable, involuntary exposures to the public.
- Increased research, at all levels, that is coordinated to maximize its effectiveness, is in the public interest.

A copy of the April 29 written order, decision no. C92-600, is available for \$3.00 from: Colorado PUC, Attn: Joyce Reed, 1580 Logan St., OL2, Denver, CO 80203, (303) 894-2000, ext.319.

### Connecticut...

- Guidelines and standards currently in force in various jurisdictions...do not appear to be exceeded in Connecticut. The academy does not see any particular utility [for the state] to adopt these guidelines....
- Absolute proof of the occurrence of adverse effects of ELF fields at prevailing magnitudes cannot be found in the available evidence....
- There are some immediate or acute biological effects of ELF electromagnetic fields at levels that commonly occur....These effects are not seen as a health hazard.
- The totality of the epidemiological studies suggests that if adverse health effects from residential EMF exposure exist, they are not likely to make a large contribution.

A copy of the report, *EMFs: Electromagnetic Field Health Effects*, is available for \$10.00 from: CASE, 410 Asylum St., Room 640, Hartford, CT 06103, (203) 527-2161.

### Texas...

- There is insufficient evidence regarding human health effects of EMFs to provide the basis for a health-based standard.
- Neither the PUC nor other state authorities [should] attempt to set EMF standards through guidelines, regulations or legislation.
- [The PUC should] take action regarding the EMF health effects issue only when, or if, action can be justified on a public health basis.
- A carefully coordinated and comprehensive national research agenda with adequate funding from a mix of governmental and nongovernmental sources is needed.

A copy of the report, *Health Effects of Exposure to Power Line Frequency EMFs*, is available for \$32.90 from: PUC of Texas, Attn: General Records, 7800 Shoal Creek Blvd., Austin, TX 78757, (512) 458-0225.

### Wisconsin...

- It is reasonable to conclude that reducing exposure to EMFs increases public safety. Doing nothing, while waiting for conclusive evidence about human health effects, is not a reasonable response to the potential risks associated with EMFs.
- The state of scientific knowledge about EMFs does justify continuing concern regarding its potential effect on human health.
- Utilities should consider supporting other EMF research programs in addition to those that are industry sponsored, including the National EMF Research Program....

A copy of the May 7 written order, docket no. 05-EP-6, is available from: PSC of Wisconsin, Hill Farms State Office Bldg., PO Box 7854, Madison, WI 53707, (608) 267-0510.

on whether to advise prudent avoidance, but, in a March report, recommended that the state PUC consider setting exposure standards. The group—whose 17 members represent diverse interests—called for state research, education and mitigation policies (see *MWN*, M/A92).

Both the Texas and Connecticut groups also encouraged further research on EMFs and health, but neither group recommended a state research program. Texas did endorse a national public-private EMF research program.

Texas' eight-member committee—an ongoing group appointed by the PUC in 1988—is made up of representatives from utilities, state government and universities.

CASE, based in Hartford, CT, is a private, nonprofit group whose 180 members are divided two to one between academia and industry, respectively, according to David Wetstone, the group's secretary. "CASE intends to model itself after the National Academy of Sciences [NAS] and do for the state what the NAS does for the federal government," he said.

The Connecticut EMF study cost about \$5,000 and was directed by Yale University epidemiology and public health professor Dr. Jan Stolwijk, who is a member of the International Radiation Protection Association's International Non-Ionizing Radiation Committee. "Utilities are aware that [prudent avoidance] is an issue," Stolwijk told *Microwave News*. "They will try to do what they can."

## Legal Notebook

### Electrical Worker's Cancer Claim Rejected

The Washington State Department of Labor and Industries has rejected a claim that an electrical worker's death from leukemia was caused by his on-the-job exposure to EMFs. "The evidence fails to establish that the death resulted from an occupational exposure," stated William Travis, a pension adjudicator at the agency, in a March 25 decision.

Robert Pilisuk had worked as a cable splicer and maintenance electrician at Seattle City Light for seven years, until his death at the age of 44 in April 1989. Pilisuk's widow, Mimi, of Seattle, filed the pension claim in March 1991 (see *MWN*, M/A91).

"The case is just starting," said Michael Withey, Pilisuk's attorney, who appealed the decision to the Board of Industrial Insurance in Olympia on April 22. Withey, of the Seattle firm of Schroeter, Goldmark & Bender, said he would request health records from Seattle City Light to see if there is a leukemia cluster among its workers.

### TLPJ Seeks Release of EMF Documents

In an attempt to give the public access to what it calls "potentially crucial" information about EMFs, Trial Lawyers for Public Justice (TLPJ), a public-interest legal group, has filed a motion in the superior court of Douglas County, GA to intervene in an EMF personal injury suit.

In its May 8 action, TLPJ seeks to block a protective order that would allow a utility, the Oglethorpe Power Co., based in Tucker, GA, to decide which of its documents it wants to treat as confidential.

"The public has a right to this information," insisted TLPJ lawyer Kieron Quinn of the Baltimore, MD firm of Quinn, Ward & Kershaw. "Millions of people could be completely unaware of the dangers of the power lines in their neighborhood," he said. Quinn told *Microwave News* that Oglethorpe Power has since withdrawn its request for confidentiality. A spokesman for the utility declined to confirm this, but, if true, the case would become moot.

Nancy Jordan and her family filed a lawsuit in July 1991, claiming that EMFs from power lines owned by Georgia Power and by Oglethorpe Power caused her non-Hodgkin's lymphoma (see *MWN*, S/O91). TLPJ filed its request on behalf of the Robert Carl Strom Foundation, an EMF education organization.

### **Michigan Utility Sued for Stray Voltage**

A dairy-farming couple in Michigan filed a lawsuit against the Jackson-based Consumers Power Co. (CPC), claiming that stray voltage from the utility's distribution lines caused "severe losses" to their dairy business. Vernon and Sally Lanphear of Monterey, MI filed the claim in Allegan County Circuit Court on March 30.

The Lanphears, who have run their dairy farm since 1987, said their cattle produce less milk and have difficulty conceiving because of stray voltage from CPC power lines on their property. The couple claimed that their income has "substantially decreased" and that their property is "worthless and unsalable"

because of the utility's negligence.

"We think Michigan Power has an obligation to provide electric power that doesn't damage property and affect business on that property," said the plaintiffs' lawyer, Jack Dougherty of the San Francisco, CA firm of Belli, Belli, Brown, Monziona, Fabro & Zakaria.

But the utility argues that any injuries alleged by the plaintiffs are not its responsibility. "We don't believe we contributed to the problem," James Dempsey, a CPC attorney, told *Microwave News*. "The stray voltage might be coming from their own farm equipment." Dempsey has requested that the court dismiss the case due to a lack of evidence.

In October 1990, a family of dairy farmers in Minnesota was awarded \$1 million in a stray-voltage suit (see *MWN*, N/D90).

### **Wisconsin Electric Offers \$25 Million Settlement**

The Wisconsin Electric Power Company will pay \$25.2 million to the family of a boy who was critically injured when he put his hands into an unlocked electrical transformer box. The settlement—the largest in a Wisconsin personal injury case—was reached on March 11 between lawyers for the utility and Willard Techmeier, the attorney for the boy's family. Techmeier is with the Milwaukee firm of Techmeier & Lowe.

On October 2, 1990, Matthew Brown, then five years old, was visiting relatives in Oak Creek when he touched a Wisconsin Electric transformer. Doctors later amputated his severely burned left arm and part of his right arm. In a public statement issued two days after the accident, the utility accepted responsibility for its actions and said it would replace or retrofit other such transformers. A padlock was missing from the box Brown opened.

## HIGHLIGHTS

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### **NCRP Steps Up NIER Activities**

The National Council on Radiation Protection and Measurements (NCRP) has set up a new committee to promote its work on non-ionizing electromagnetic radiation (NIER). Scientific Committee 89 (SC89) will serve as an "umbrella" group to coordinate the council's activities on public, occupational and medical exposures to NIER. SC89 will cover NIER from DC to ultraviolet ( $0-10^{15}$  Hz).

The committee was set up because NIER "is going to be very important over the next decade," Dr. Tom Tenforde, the chairman of SC89, told *Microwave News* from his office in Richland, WA, where he is chief scientist at the Battelle Pacific Northwest Labs' Life Sciences Center. Tenforde, with the encouragement of NCRP President Dr. Charles Meinhold, first proposed the initiative last year. The NCRP's board of directors, on which both Tenforde and Meinhold sit, approved the creation of SC89 at its quarterly meeting on April 2.

The committee's first task is to help three existing committees finish their projects. Tenforde said, "Umbrella committees can be very helpful in assisting committees to complete their reports."

Tenforde said that he is considering starting new committees on: lasers in medicine; MRI and in vivo spectroscopy; hyperthermia procedures and applications; and ultraviolet light. Each of the committees would review dosimetry, exposure assessment, biological effects, mechanisms of interaction, public and occupational exposure limits and mitigation techniques. The establishment of such committees will depend on the availability of funds.

SC89 may also issue "commentaries," which would be less detailed than committee reports and which would take less time to complete, Tenforde said. He cited video display terminals and police radar as possible topics for commentaries.

The three ongoing efforts that will now be overseen by SC89 are: SC67, "Biological Effects of [Static] Magnetic Fields," chaired by Dr. Dennis Mahlum, formerly of Battelle and now at the National Research Council in Washington, DC; SC78, "Practical Guidance on the Evaluation of Human Exposures to Radiofrequency Radiation," chaired by Richard Tell of Richard Tell Associates Inc. in Las Vegas, NV; and SC79, "Extremely Low Frequency Electric and Magnetic Fields," chaired by Dr. Ross Adey of the VA Hospital in Loma Linda, CA. SC67 was set up in 1979-1980, and both SC78 and SC79 were established in 1984 (see *MWN*, D83, Ap84 and J/F86).

Mahlum's and Tell's reports are in final editing following council review, according to William Beckner, NCRP's staff officer for both committees. Dr. Constantine Maletskos, the staff officer for SC79, said that 90% of Adey's report is in draft form and that "the current plan is to get the report out by March 1993."

The NCRP has invited eight experts to join Tenforde on SC89. He is planning to hold a first meeting this summer. An NCRP staff officer has not yet been assigned to work with SC89.

## **U.S. Senator Seeks National Police Radar-Cancer Study**

Responding to concerns over the possible health risks associated with traffic radar, Sen. Christopher Dodd (D-CT) has asked the National Institute of Environmental Health Sciences (NIEHS) to "initiate an epidemiologic study to see if hand-held traffic radar units pose a risk for cancer."

"Anecdotes of cancer clustering among police officers have become widespread," Dodd wrote in a May 26 letter to Dr. Kenneth Olden, the director of NIEHS. Based in Research Triangle Park, NC, NIEHS is part of the Department of Health and Human Services' National Institutes of Health.

In a related development, Sen. Joseph Lieberman (D-CT) has announced that he will hold a congressional hearing this summer on the health risks associated with police radar. Lieberman, the chairman of the Governmental Affairs Committee's subcommittee on consumer and environmental affairs, said, "I am struck by the lack of research, governmental oversight and

## **Other Police Radar Developments**

### **RIT Study Shows Elevated Cancer Risks**

Dr. John Violanti of the Rochester (NY) Institute of Technology (RIT) has found an elevated risk of cancer for police officers exposed to traffic radar, according to an analysis of questionnaires that the Police Benevolent Association of New York State (PBA/NYS) mailed to 6,000 active and retired members last November (see *MWN*, J/F92). Conclusions from the study are limited, however, because response to the survey was voluntary and only 164 officers replied.

"This was a good pilot study, a good starting point," Violanti said, adding, "Something is going on that we need to find out about." Officers who reported using hand-held radar had the greatest cancer risks: five of the nine officers who reported using a Kustom Signals HR-8 had cancer, and seven of 14 who reported using an MPH Industries K-55 had cancer; Violanti calculated that this was a 5.0-fold increase for users of the HR-8 and a 4.1-fold increase for users of the K-55.

Violanti also found statistically significant elevated risks for testicular cancer, colon cancer, thyroid cancer and breast cancer, though these were based on a small number of cases.

Violanti has written a more detailed questionnaire, which was mailed by PBA/NYS to 2,000 of its members. He said he would like to see a much larger cohort study: "You need to get a huge number of people, maybe 25,000 or 30,000 police officers nationwide."

### **Defendants Seek Dismissal in Bendure Case**

A motion for summary judgment in the product liability lawsuit filed by Eric Bendure is set to be argued July 9 in U.S. District Court in San Francisco, CA. The defendants in the case, Kustom Signals Inc. of Overland Park, KS and MPH Industries of Owensboro, KY, are seeking to have the case dismissed. "They

contend simply that it's not possible that these radar guns can cause cancer," Bendure's attorney, Jack Sweeney of Agoura Hills, CA, told *Microwave News*.

This is the first test of the scientific basis for these cases, Sweeney said. If the motion is denied, Sweeney has trial dates of August 11 for the Bendure case (see *MWN*, J/A91) and September 14 for the case brought by Steven Cottini (see *MWN*, S/O91). Both officers developed cancer after using police traffic radar.

A third police radar suit Sweeney is handling has been put on hold, following the death of the plaintiff, Leo Hutchison, on April 25. "We've chosen to withdraw the case for now and refile it as a wrongful death suit," Sweeney explained. Hutchison's wife and son will be plaintiffs in the new case.

### **New Case Filed in Ohio**

An Ohio state trooper who has brain cancer has sued Kustom Signals and MPH Industries. Wayne Vessels's suit was filed March 23 in U.S. District Court for the southern district of Ohio. His wife is also named as a plaintiff.

The court allowed an expedited deposition due to Vessels's deteriorating health, according to his attorney, Michael Cassity of the Mt. Orab, OH firm of Cassity, Kelly and Wallace. Vessels's testimony was videotaped April 9.

Cassity told *Microwave News* that the officer was first diagnosed with skin cancer on the right side of his face in 1977. The cancer spread to his eyelid and then to his brain: "His prognosis is terminal." Cassity said his client used a Kustom MR-7 radar—mounted on the rear passenger window, inside the vehicle, facing forward—from 1972 until 1977. Even after he was diagnosed with cancer, he stayed on the force, using a dashboard-mounted MPH unit, which the Ohio state police began using in the late 70s. Vessels was forced to retire in 1986, Cassity said, when he lost his right eye to the cancer (see *MWN*, M/A91).



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federal standards." He added that research into the biological effects of microwave radiation is "all but nonexistent."

Connecticut has been at the center of concern over the risks of police radar. On June 2, Governor Lowell Weicker signed HB5070, which outlaws the use of hand-held traffic radar by all police officers in the state. The measure was sponsored by state Rep. Joseph Adamo (see *MWN*, M/A92).

The Connecticut State Police and a number of local departments had already limited use of hand-held radar (see *MWN*, N/D91), following a campaign by the International Brotherhood of Police Officers (IBPO). The union estimated that 50-60% of the state's municipalities had agreed not to use their hand-held units. "This law is going to save an awful lot of lives because there were police officers who were still using hand-held radar," IBPO's Sam Franzo told *Microwave News*.

Franzo also praised Dodd's request, saying, "We've been calling for a national study for a year."

Dodd wrote that a case-control study "would be relatively inexpensive yet timely [and] might then prompt a more in-depth investigation." He concluded that, "The everyday work of law enforcement officers is already dangerous. As public servants, the least we can do is to assure them of a safe workplace."

The IBPO has been lobbying for health research. In a May 18 letter to Dodd, Kenneth Lyons, the union's national president, wrote that, "The IBPO believes a link exists between prolonged occupational exposure to hand-held traffic radar units and subsequent development of cancer." He added, "No comprehensive studies exist at any level to either confirm or repudiate any link."

The potential link between police radar and cancer has been widely reported in Connecticut and elsewhere (see *MWN*, S/O91, N/D91 and M/A92). The manufacturers of the radar guns are being sued by officers in Connecticut and four other states who have developed cancer (see p.7).

## SAB Issues Critique of EPA EMF Research Plan

The Environmental Protection Agency's (EPA) research strategy for electromagnetic fields (EMFs) was criticized for being vague and unfocused in a May 11 letter to EPA Administrator William Reilly from the Science Advisory Board (SAB).

The letter represents the consensus of 16 of the 17 members of an SAB subcommittee. Dr. Richard Wilson, a physicist at Harvard University in Cambridge, MA, refused to join the other panelists, *Microwave News* has learned. The letter said the dissent stemmed from "fundamental disagreement with EPA's approach."

The 16 members agreed on the need for EMF research because of the "almost universal exposure of populations to EMF throughout life." But the panel charged that EPA had grossly underestimated the cost and time needed to resolve the health questions: it put the price tag at up to \$100 million a year for at least three to five years.

Earlier this year, the SAB panel issued its review of the

## 60 Minutes Investigating Police Radar-Cancer Link

Morley Safer, a correspondent for *60 Minutes*, the CBS television news magazine, is looking into allegations that police officers who are exposed to microwave radiation from hand-held traffic radar units face an elevated risk of developing cancer.

The segment will be aired this summer or in the fall, according to CBS producers. More Americans regularly watch *60 Minutes* than any other show on television.

agency's EMF-cancer report (see *MWN*, J/F92). The SAB has now completed its work on EMFs but will probably return to the issue when EPA completes its revision of the report.

Among the subcommittee's conclusions are:

- The level of detail in the document is insufficient for setting specific research goals and priorities.
- If EPA chooses to develop a scientifically credible research strategy independently, it should also propose a mechanism by which such a strategy can be implemented.
- Effects on [the] nervous system...should receive more emphasis.
- A research strategy must emphasize the more fundamental and far-reaching need for basic understanding of biological effects and biophysical mechanisms.
- High priority [should] be placed on identifying and replicating in several laboratories the few key experiments that can determine the reproducibility of effects that appear to challenge simple biophysical models.
- The identification of the relevant metric is critical both to formal risk assessment and to risk management should a significant risk be found to exist.
- Three applied research areas are not included in the EPA document in which the subcommittee recommends some limited effort be undertaken: risk perception, risk communication and risk management.

The members of the SAB subcommittee charged with reviewing the EPA plan had voiced many of these concerns at a public hearing last year (see *MWN*, J/A91).

For a copy of the SAB's review of *A Research Strategy for EMFs: Research Needs and Priorities*, contact: Lori Gross, SAB (A-101), EPA, 401 M St., SW, Washington, DC 20460, (202) 260-4126.

## Magnetic Material Found in Human Brain Tissue

Researchers at the California Institute of Technology in Pasadena have isolated microscopic crystals of magnetite from samples of human brain tissue. "I was struck by the similarities between the human magnetite and the magnetite found in magnetic bacteria," said Dr. Joseph Kirschvink, who led the Caltech team, adding that the crystals "are shaped in such a way as to be



optimal for use as a magnet."

"It is possible that the presence of magnetite may mediate any health effects of EMFs," Kirschvink said, but he cautioned that, "In my opinion, the jury is definitely still out on whether EMFs actually do have health effects." He also warned that, "I want to be explicit about the fact that we have no evidence at this time that humans have a magnetic sense."

In a series of interviews, members of the bioelectromagnetics community expressed skepticism that this discovery was the key to the mechanism of EMF interactions. "This is a significant finding, but I doubt that it has anything to do with explaining 60 Hz biohazards," Dr. Robert Becker, the author of *The Body Electric* and *Cross Currents*, told *Microwave News*.

In their paper, which has been accepted for publication in the *Proceedings of the National Academy of Sciences*, the Caltech researchers explain how the magnetic particles might be affected by EMFs: "The magnetic torque from external alternating fields will induce mechanical oscillations in the particles, and the potential exists for such motions to do things like opening transmembrane ion channels." According to their calculations, the intensities of the 50 or 60 Hz fields would have to be slightly stronger than the Earth's static field—approximately 500 mG.

Kirschvink and his coworkers are not the first to have found magnetic materials in humans. In 1983, a team at the U.K.'s University of Manchester, led by Dr. Robin Baker, reported that bones from the human sinuses are magnetic (see *Nature*, 301, pp.78-80, 1983).

Kirschvink's paper has been widely publicized in the press. See, for instance, the *Los Angeles Times* (May 12), the *New York Times* (May 12), *Science* (May 15) and *The Economist* (May 16).

## **NIST and FAA To Test Avionics for Immunity to EMI**

Under an agreement with the Federal Aviation Administration (FAA), the National Institute for Standards and Technology (NIST) will test the ability of electronic flight systems to withstand electromagnetic interference (EMI) from high-power radiofrequency and microwave (RF/MW) radiation.

Initially, the NIST will test the immunity of avionics to a variety of different sources, including broadcast antennas and high-power radars, Abbas Rizvi, the FAA program manager, told *Microwave News*.

The decision to use the NIST follows a May 4 congressional report pressing the FAA to perform independent testing. Aircraft makers claim that the FAA has no justification for its existing EMI policy of immunity to 100 V/m. The FAA bases the limit on tests carried out at its Atlantic City, NJ research facility, according to agency officials.

At a March 11 congressional hearing, Edward Stimpson, president of the General Aviation Manufacturers Association (GAMA), based in Washington, DC, testified that the FAA "has yet to conduct a reasonable test program," and he recommended

using the NIST. At issue is \$500,000 that Congress gave the FAA last year for testing but which the agency has not yet spent.

The FAA has not published a notice of proposed rulemaking concerning high-power RF/MW radiation, though it has had plans to do so for several years (see *MWN*, N/D89 and J/A90). Nevertheless, the agency applies the 100 V/m limit as a special condition on plane designs, Stan Green, an attorney for GAMA, told *Microwave News*. He contends that an official rule would "never get past the Office of Management and Budget [OMB], because the FAA has zero accidents and zero incidents" to justify the need for a rule. The OMB, an arm of the White House, evaluates proposed rules before they are published.

The congressional report accompanies the FAA's research legislation, H.R.4557 (House Report 102-511).

## **Navy Shelves Plans For Gulf Coast EMPRESS II Site**

The U.S. Navy has announced that, due to "fiscal pressure," it no longer plans to use the proposed Gulf of Mexico site for its electromagnetic pulse (EMP) simulator, known as EMPRESS II.

The Navy has scaled back the EMPRESS II program and expects to complete only two ten-day trials per year, said Lt. Commander Joseph Osborne, who is in charge of the program at the Naval Sea Systems Command in Washington, DC. These tests can be performed at the Atlantic Ocean site, off the coast of North Carolina, where the Navy has operated EMPRESS II—which stands for EMP Radiation Environment Simulator for Ships—during the summer months since 1988, Osborne explained.

The oceangoing test facility is designed to simulate the EMP that accompanies a nuclear blast to study its effects on ships' electronics. While the Navy once planned ten cycles of testing per year—five at each site—it ran only two trials in each of the last two years at the Atlantic site and has only one scheduled for this year, according to Osborne.

Opponents of the proposed site, which is about 25 nautical

### **Finnish VDT-Pregnancy Study: EMF Risks at Lower Levels**

In our last issue, we reported on a new Finnish epidemiological study showing that women using VDTs with strong magnetic fields had elevated rates of miscarriages.

*Microwave News* has now learned that the magnetic field levels specified in the Finnish report are "peak-to-peak" values, not the average or rms values to which most people refer. For VDT EMFs, dividing a peak-to-peak intensity by three yields the approximate rms value. Thus, the Finnish study points to an elevated miscarriage risk from exposures of about 3 mG or less.

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miles south of the Mississippi and Alabama coastlines, are claiming victory, according to Mike Odom, a Montgomery, AL attorney who has led the local opposition to EMPRESS II. "We made it clear to the Navy that their environmental impact statement [EIS] was so inadequate that they risked a strong legal challenge." The Navy released a final EIS for the Gulf site in October 1991 (see *MWN*, M/J90 and J/F92).

If the Navy decides it wants to renew plans for the Gulf site, it will "comply with the requirements of [the National Environmental Policy Act], including public notification and interaction," according to a *Record of Decision* signed on March 24 by Elsie Munsell, deputy assistant secretary of the Navy for environment and safety. Had funds been available, Osborne said, "the questions concerning the project were, we feel, sufficiently answered to allow the program to go forward."

Separately, the Navy has settled a lawsuit brought in 1988 in an attempt to block the use of EMPRESS II at its Atlantic site. The plaintiffs, the Foundation on Economic Trends (FET), a Washington, DC-based think tank, and a regional planning commission in North Carolina, have agreed not to contest the site further. The plaintiffs' attorney, Lee Rogers of Rogers, Goxem and Krickenberger in Washington, said that interest had waned in North Carolina because the Navy moved the testing further offshore. The choice of the open-ocean site was itself a compromise after opposition forced the Navy to abandon plans to use EMPRESS II on Chesapeake Bay (see *MWN*, Oct84, Nov84, M/A87 and J/A87).

In March 1987, the FET sued the Department of Defense (DOD), seeking environmental review of existing EMP programs in all branches of the military (see *MWN*, M/A87). That suit was settled in May 1988 when the DOD agreed to shut down many of its EMP facilities, including an earlier Navy simulator known as EMPRESS I (see *MWN*, M/J88).

The 84-page *Record of Decision*, which supplements the

### Gulf War EMP Weapon Reported

The U.S. Navy used a nonnuclear electromagnetic pulse (EMP) weapon on the first day of the Persian Gulf war to disrupt or destroy electronic defense and communications systems in Iraq, according to an article in the weekly trade publication *Defense News* (April 13-19). The article cites unnamed military and industry sources who describe a highly secret "black program" for development of the weapon. EMP warheads were carried on a few of the Navy's Tomahawk cruise missiles, the report states.

"It was worth doing simply because there was an opportunity," one industry expert told *Defense News*.

Neil Munro, who coauthored the piece with Robert Holzer, told *Microwave News*, "At first I didn't believe it, but enough people said it was true for me to write it."

It was difficult to judge the damage that the EMP warheads, a type of high-power microwave weapon, inflicted on Iraqi electronic equipment, since many other electronic countermeasures were also being used.

In the same issue of *Defense News*, Munro also reported on an Army program to develop high-power microwave devices for tanks as a mine-clearing tool. These weapons are designed to disable a mine's electronic circuitry. They are being developed by General Dynamics Corp. of Falls Church, VA.

EIS for the EMPRESS II Gulf Coast site, outlines issues raised in almost 200 letters that the Navy received. Both documents are available from: Lt. Commander Joseph Osborne, Naval Sea Systems Command (PMS-423), Department of the Navy, Washington, DC 20362, (703) 602-3348.

### Cellular Phone Suit (continued from p.1)

duration of her cellular phone use.

The Reynards' suit alleges that the phone had "an antenna so positioned as to cause exposure to microwave radiation in an excessive and unsafe amount to the portion of the brain where the tumor was found...." David Reynard is more specific. If an outline of the phone were superimposed on the MRI that showed his wife's tumor, the malignancy would be at the middle of the antenna, he told *Microwave News*. "It makes a perfect bull's-eye," he said.

NEC America is a subsidiary of NEC Corp. of Japan, and GTE Mobilnet of Tampa, which provided the Reynards' cellular service, is part of GTE Corp., based in Stamford, CT. Spokesmen for both companies said they would not comment on ongoing litigation. A third defendant, Coastal Radiotelephone Inc., sold the Reynards the cellular phone but is no longer in business.

Lloyd said the suit was prompted by the occurrence of other

similar cancer cases in which users of cellular phones developed brain tumors. Lloyd said he and David Reynard know of three doctors in the Tampa Bay area who were heavy cellular phone users and who died from brain cancer.

The lawsuit is currently in discovery. Lloyd said the court allowed an expedited deposition to be taken from Susan Reynard because her health was deteriorating. He videotaped her testimony on April 24, covering the extent of her cellular usage and the history of her illness. "We had to get the suit started," Lloyd said. "I don't know how fast we'll move now."

The Reynards' complaint also alleges that "the cellular telephone did not meet accepted standards setting maximum levels of exposure to microwave radiation." In the U.S., the most widely cited guidelines for exposure to microwave radiation are the American National Standards Institute (ANSI) limits that were set in 1982 and recently revised (see *MWN*, N/D91). The standards have an exemption for devices with an input power of

seven watts or less. This exclusion was the subject of controversy during the revision process, when it was first deleted and then reintroduced (see *MWN*, S/O89 and N/D90). According to NEC specifications, the P9000 has an output power of 0.6 watts and operates at 825-845 MHz.

While cellular phones have not previously been the subject of litigation over health effects, suits have been brought concerning exposure to radiofrequency radiation from broadcast towers (see *MWN*, S/O89 and N/D90) and microwave radiation from military radar (see *MWN*, N/D90) and police radar (see p.7 and *MWN*, M/A91, S/O91 and M/A92).

### **IRPA Drafts Advisory on Safety of Mobile Telephones**

The International Non-Ionizing Radiation Committee (INIRC) of the International Radiation Protection Association (IRPA) is preparing a position statement on *Protection Against Electromagnetic Radiation from Mobile Telephones*.

INIRC's objective is "to make the manufacturers of devices and the network operators consider essential health aspects...to prevent adverse health effects," according to an April 3 draft of the statement obtained by *Microwave News*.

The draft rejects the controversial seven-watt exclusion clause, adopted by the American National Standards Institute (see *MWN*, S/O89 and N/D91), which assumes that devices with a power of less than seven watts will not affect health.

INIRC is also considering a recommendation that partial body exposures from portable radios, including cellular phones and walkie-talkies, be limited so that the temperature of any organ, including the eyes, is not raised by more than 1°C.

"The draft is still only under discussion and has not been adopted," Annette Duchêne, the secretary of INIRC, told *Microwave News* from her office outside Paris, France. She said that the draft was reviewed at INIRC's last meeting in mid-May in Vancouver, Canada, and that she does not expect its approval in the near future. Duchêne also said that at IRPA's May meeting, held in Montreal, Canada May 17-22, INIRC became the International Commission on Non-Ionizing Radiation Protection.

Meanwhile, one of the papers that has prompted concern over the potential health risks from hand-held radios has been published. "Energy Absorption Mechanism by Biological Bodies in the Near Field of Dipole Antennas Above 300 MHz," by Dr. Niels Kuster of the Swiss Federal Institute of Technology in Zurich and Dr. Quirino Balzano of Motorola in Fort Lauderdale, FL, appears in the February 1992 issue of the *IEEE Transactions on Vehicular Technology*, 41, pp.17-23 (see *MWN*, N/D90).

### **Croatian Radar Studies (continued from p.1)**

blood, as well as in their brain activity. (Interestingly, she identified opacities in the posterior pole of the lens of some workers' eyes.) The men were exposed to 1250-1350 MHz microwaves at levels ranging between 10  $\mu$ W/cm<sup>2</sup> and 20 mW/cm<sup>2</sup> but generally below 5 mW/cm<sup>2</sup>. In a paper presented at the 1st Congress of the European Bioelectromagnetics Association in January, Goldoni reported that, "Long-term occupational exposure to microwaves and radiofrequencies may damage sensitive organ systems." She published some preliminary results in *Health Physics* in 1990.

At the same time, a second team, headed by Garaj-Vrhovac, has been running a series of laboratory experiments. The researchers exposed both human lymphocytes and Chinese hamster cells to 7.7 GHz microwaves (continuous wave) and found evidence of chromosomal aberrations and the formation of micronuclei (small fragments of chromosomes that are indicators of genetic changes). In both sets of studies, they concluded that the microwave radiation could cause genetic damage.

In a paper published in *Mutation Research* in 1991, Garaj-Vrhovac and Drs. Durda Horvat and Zlatko Koren concluded that "microwave radiation can induce damage in the structure of chromosomal DNA" in the hamster cells. Garaj-Vrhovac published similar findings on the human cells in *Mutation Research* earlier this year.

Koren, a professor of electrical engineering at the University of Zagreb, is also active in encouraging European research and cooperation in the field of non-ionizing radiation (see *MWN*, J/F92).

But the clearest evidence of the genetic risks of microwave radiation came in 1990, when six of the men whose health was being monitored by Goldoni were accidentally exposed to abnormally high levels of microwave radiation. A radar was mistakenly turned on while they were working nearby—the precise extent of their exposures is unclear. All six were found to have chromosomal aberrations, but later examinations showed that these decreased over time.

When Garaj-Vrhovac compared their chromosomal changes with those of human lymphocytes exposed to 7.7 GHz microwaves in cell cultures, she found the same types of aberrations in the two sets of samples. High levels of microwave radiation increase chromosomal aberrations, she said, emphasizing that it is now time to identify the exposure threshold for genetic activity.

Goldoni is continuing to analyze her epidemiological data and plans to complete her study by the end of the year. At the same time, she and the other Zagreb researchers are investigating the effects of low frequency electromagnetic fields (EMFs). "We are now turning our attention to power frequency EMFs, though we plan to continue our work with microwaves," Koren told *Microwave News*.

The ongoing war in the region is forcing many people to work with radar. "We will be following these people after the war, to see if we can detect any effects of the radiation and to see

## HIGHLIGHTS

if we can develop a dose-response relationship," Koren said.

Koren is interested in hearing from other researchers pursuing similar types of studies. Contact: Professor Zlatko Koren, Faculty of Electrical Engineering, University of Zagreb, Unska 3, 41000 Zagreb, Croatia, (38+41) 629 606; fax: (38+41) 611 396.

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### — Commentary —

## Radar Radiation: A Call for Research

The new Croatian radar studies (see p.1) and the continuing uproar over police radar (see p.7) demonstrate that U.S. health agencies are neglecting a potentially significant occupational and public health issue. It is ironic that the efforts of a country as small as Croatia overshadow those of the U.S., where radar is an essential part of military technology, air traffic control and police enforcement.

The results from the University of Zagreb are consistent with other research findings—especially those from Sweden—which point to serious biological and health effects that have nothing to do with heating.

At a time when there is a consensus on the need for more research on ELF EMFs, we must also step up work on the RF/MW frequencies. The Environmental Protection Agency panel that just completed its review of the agency's cancer report made a special plea to not ignore RF/MW radiation: "The report should...declare explicitly that the attention given to non-ionizing EMFs derives in the first place from long-standing concern over the hazards of [RF/MW] radiation" (see *MWN*, J/A91 and J/F92).

Indeed, Sir Richard Doll, who chaired the National Radiological Protection Board advisory group that recently issued a report on EMFs in the U.K., concluded that the cancer risk from RF/MW radiation is of greater concern than that from ELF EMFs (see *MWN*, M/A92).

The first step is to expand on the research now being done almost exclusively by the U.S. Air Force (USAF) and the other branches of the Department of Defense. The health agencies must establish their own credible programs free of real or perceived conflicts of interest—as is being considered for the national EMF research effort (see p.13).

Much needs to be done. Here's how to start:

- Initiate a national epidemiological study of cancer, especially testicular cancer, among police officers using traffic radar, as recently urged by Sen. Christopher Dodd (D-CT) (see p.7). At

the same time, a second study should investigate those exposed to the more powerful military and civilian radars.

- Resume work on the effects on the blood-brain barrier. Despite a succession of provocative results over the last 15 years, the military continues to push this subject under the rug (see *MWN*, S81, S/O86 and J/A88). The Swedes and the Canadians are pursuing this line of research—not only over concern about hazards but also for its potential as a way of delivering drugs to the brain (see *MWN*, J/F92).

- Pursue the equally compelling Swedish findings showing changes in the cerebrospinal fluid of radar workers (see *MWN*, My85 and M/J89).

- Increase support for the Johns Hopkins University and Food and Drug Administration studies on microwave effects on the eyes, with special emphasis on the observed drug-microwave synergy. Due to a lack of funding, this important work is moving too slowly (see *MWN*, J/A83, S/O86, J/A87, J/A88 and S/O91).

- Follow up the medical histories of workers injured by radar. In almost every case, the USAF and the Navy have refused to monitor the long-term health of those accidentally overexposed (see *MWN*, J/A86 and J/F88).

- Investigate the possible link between a cancer cluster among residents of a Florida housing development and a nearby FAA-USAF radar (see *MWN*, J/F92).

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# FROM THE FIELD

## House Report on National EMF Research Program

*Excerpted below is the text of the House Committee on Science, Space and Technology report (No.102-474, Part 2, pp.117-124) on the Comprehensive National Energy Policy Act (H.R. 776), which includes the Brown-Scheuer bill for a National Electric and Magnetic Fields Research Program (NERP)—see MWN, NID91, JIF92 and MI A92. We have omitted a section on the DOE as the lead agency, since the bill has since been amended to assign this responsibility to NIEHS (see p.3). Nevertheless, the report is written in terms of delegating tasks to the Secretary of the DOE.*

### Background

**1. Scientific Background:** In recent years the public has become increasingly concerned that exposure to EMFs may pose a threat to human health....The available scientific evidence is extremely ambiguous and suggests that if there are health effects for EMFs they do not follow a traditional dose-response relationship...

**2. Economic and Regulatory Effects:** Amid the scientific uncertainty surrounding potential health effects of EMF exposure, pressure to reduce or avoid public exposure to high levels of EMFs has been building....

**3. Current Research and Need for NERP:** Though there is some pressure for regulation of EMF exposure, few people argue that it is appropriate to regulate at this time given the scientific uncertainty concerning safety. In fact, premature regulation of field strength could prove not only costly but also counterproductive if another parameter of the fields were found to be responsible for producing adverse health effects. The primary need conveyed by virtually all parties concerned with the EMF issue including utilities, computer and electrical equipment manufacturers, labor unions and public interest groups, is for an increased level of credible, high-quality research focused on health effects.

At present, federal research on EMFs is concentrated primarily in DOE, which received \$5 million for EMF research and was designated the lead federal agency for such research in the FY92 Energy and Water Development Appropriation. DOE's FY93 budget request for this area is up \$2.5 million to \$7.5 million. EPA also receives funding for EMF research at a level of \$1.9 million and has requested the same amount for FY93....

In order to avoid spending money on research which may not be perceived as credible and in order to establish a mechanism for coordination of EMF research on a national level, a large number of utility and electric equipment groups are interested in cofunding with the federal government a [NERP]. Sponsorship by the federal government, with appropriate peer review, would increase public credibility of the research while cofunding by nonfederal entities such as industry and states would enable an accelerated research program designed to answer the questions surrounding EMFs as soon as possible.

### Explanation

The program...attempts to address the lack of coordination within the federal government and among the federal government, states and industry; the need for increased research...and the need to achieve and maintain high public credibility for EMF research. In order to increase coordination among those conducting or interested in EMF research, the legislation establishes a committee of representatives from federal agencies to coordinate the federal research effort and an advisory committee of representatives from states, unions, industry and public interest groups. To address the need for increased research, the legislation authorizes a five-year, \$60 million research program to be cofunded by voluntary contributions from the nonfederal sector. In order to ensure the credibility of the research program, mechanisms for scientific peer review of proposals and conflict-of-interest provisions for researchers are included in the legislation.

**1. Interagency Committee [IC]:** [This committee will] coordinate the work of all the federal agencies involved in EMF issues....The committee intends that the IC should be a working-level group whose members have expertise in issues relating to EMFs....The IC is directed to develop a comprehensive agenda for research on the possible human health effects of EMFs and to update that agenda on a biennial basis to reflect new information....The agenda should focus primarily on 60 Hz EMFs....The committee does not intend to exclude completely related research on [ELF EMFs] and on [VLF EMFs], however, and encourages research on frequencies typical of emissions by [VDTs].

**2. Advisory Committee [AC]:**...The AC is to be composed of representatives from state regulatory agencies, state health agencies, electrical utilities, electrical equipment manufacturers, labor unions and public interest groups....The AC, therefore, is directed to establish priorities within the research agenda developed by the IC and to update those priorities as necessary to reflect new information....

**3. NERP: A. Selection of Projects:**...In order to ensure high-quality, credible science, the Secretary shall submit all the research proposals to at least one peer review panel of scientific and technical experts....

**B. Reporting of Research:** The legislation requires that researchers submit reports to the National Academy of Sciences [NAS], the IC, and the AC summarizing the activities and results of their projects. The NAS is directed to submit annual reports to the IC and AC which evaluate completed research and make recommendations as to how to transfer information gained through the program to states, industry, unions and the public. The IC and AC are also directed to submit annual reports to Congress....The committee further intends that all results of the research program shall be available to the public and especially encourages researchers to publish their results in the peer-reviewed scientific literature.

**C. Conflicts of Interest:** The committee and many of the groups supporting the concept of the NERP are particularly concerned that the research program should be as free of bias and conflict of interest as possible....The issue of credibility has been an especially sensitive one in the development of this legislation because of serious credibility problems with an asbestos research program sponsored by the EPA and industry and conducted by the Health Effects Institute....

In order to avoid a similar situation with this research program, the legislation specifies that the Secretary shall include conflict-of-interest provisions in grants and contracts which require researchers to disclose all funds received for consulting work and for related research and which prohibit researchers from testifying in court on research they are performing for the NERP. Researchers may testify on other research they have performed or are conducting. However, the spirit of the conflict-of-interest provisions precludes testimony on any research which bears a direct relationship to a researcher's work for the NERP. The provisions apply only to the time during which a researcher is conducting projects for the program.

**4. EMFs Public Information Dissemination Program:** [A] responsible and effective information program on EMF should take into account the complex and ambiguous nature of current scientific knowledge about possible health effects...

### Cost-Sharing

...The Secretary is directed to obtain 50% of the total funding for research to be funded in each given year from offsetting receipts voluntarily contributed by nonfederal entities....In the event that the Secretary does not obtain nonfederal contributions to fund the research efforts in a given year, however, the legislation gives the Secretary the authority to fund research projects whose probable benefits the Secretary considers to outweigh the public interest in acquiring 50% funding from nonfederal sources....

# UPDATES

## EXPOSURE ASSESSMENT

**Telephone Company Employees...** Bellcore, the research arm of the regional Bell companies, has completed a survey of the ELF EMF exposures of telecommunications workers and has determined that "differences between occupational and nonoccupational magnetic field exposures are not very large." At randomly selected work sites, about 300 employees wore EMDEX C meters as they went about their usual work routines. Data from these subjects were compared with exposure measurements for about 30 workers who agreed to wear the meters outside of work. On the job, 95% of the participants had time-weighted exposure averages of less than 8.2 mG, and away from work, 95% had averages of less than 4.1 mG, according to an abstract of the results, which was presented at the *8th Annual Meeting of the Electromagnetic Energy Policy Alliance*, held May 4-6 in Alexandria, VA. David Rainer, Bellcore's director of environmental health and safety, who led the study, told *Microwave News* that the occupational exposure data were not analyzed by job category. Bellcore is not releasing the study, Rainer said. For more information, contact: Ron Riechmann, Bellcore, 1D-150, 290 West Mount Pleasant Ave., Livingston, NJ 07039, (201) 740-6129.

**Canadian Survey...** TransAlta Utilities Corp. in Calgary, Alberta, has measured EMFs at sites across Canada for the Canadian Electrical Association (CEA). Measurements were made at a variety of utility facilities and at 243 residences and 14 workplaces. Generating plants were found to have the strongest magnetic fields—up to 2 G. Substation magnetic fields were less than 20 mG; transmission line magnetic fields, measured 30 meters from the center line, were less than 30 mG. The report states that magnetic fields in residences "can vary tremendously, depending on proximity to power lines, characteristics of the household wiring and appliance use." *Measurement of Electric and Magnetic Fields*, Report No. 272T677, is available for \$500.00 (U.S.) from: Carmelina Aparicio, CEA, 1 Westmount Sq., Suite 1600, Montreal, Quebec H3Z 2P9, Canada, (514) 937-6181, ext.317.

## MOSCOW EMBASSY

**Activating the Great Seal...** In his new book, *Molehunt: The Secret Search for Traitors That Shattered the CIA*, David Wise sheds new light on the continuing enigma of why the Soviet Union beamed microwaves at the U.S. embassy in Moscow for many years beginning in the 1950s (see *MWN*, Ja81, D83 and M/A88). His source on this topic is Peter Karlow, a former OSS and CIA official who, according to Wise, is as close as one can get to an American "Q"—Ian Fleming's fictional character who equipped James Bond with high-tech gadgetry. Karlow described how the CIA found a listening device planted in a replica of the Great Seal of the U.S., which had been presented to the Americans by the Soviets and placed in the ambassador's office. Karlow told Wise: "There was a passive device inside the seal, like a tadpole, with a little tail. The Soviets had a microwave

signal beamed at the embassy that caused the receptors inside the seal to resonate." Wise explains that, "A human voice would affect the way the device resonated, allowing the words to be picked up." His book was published by Random House earlier this year.

## OVENS

**Microwaving Breast Milk...** Using a microwave oven to reheat a mother's breast milk diminishes the milk's infection-fighting properties, according to researchers at the Stanford University School of Medicine in Stanford, CA. "This preliminary study suggests that microwaving human milk could be detrimental," they write in the April 1992 issue of *Pediatrics*. The team, led by Dr. John Kerner, demonstrated that microwaving human breast milk to low (20-53°C) or high (72-98°C) temperatures breaks down antibodies and proteins that inhibit bacterial growth and fight infection. In a separate experiment, they showed that milk heated to at least 98°C in a microwave oven and then dosed with *E. coli* grew 18 times the bacteria of milk that had not been heated; even milk heated to low temperatures (20-25°C) had five times as much bacterial growth. All samples, including unmicrowaved controls, had been frozen and were allowed to thaw at room temperature. The paper argues that the diminished anti-infective properties "are difficult to explain" based on heating alone. Storing breast milk in freezers and heating it in microwave ovens is now a matter of course in many intensive care nurseries, the authors point out. The Stanford study comes on the heels of a World Health Organization (WHO) report, which found no evidence that cooking with microwaves induces harmful effects (see *MWN*, M/A92). (For more on microwave ovens and cooking, see *MWN*, S/O88, M/A89 and M/J90.)

## PEOPLE

At its annual meeting, held on April 2, the National Council on Radiation Protection and Measurements (NCRP) elected nine new members, including Dr. David Hoel of NIEHS, Dr. Gilbert Omenn of the University of Washington, Seattle and David Sliney of the U.S. Army Environmental Hygiene Agency. In addition, Dr. Bill Guy of the University of Washington, Seattle was reelected and Dr. Leonard Sagan was elected an honorary member....Dr. Samuel Milham Jr. has retired from the Washington State Department of Health. He plans to continue to do research and to consult on EMF issues....Dr. Abe Liboff of Oakland University in Rochester, MI was presented the Humanitarian Award by the Robert Carl Strom Foundation at the foundation's annual meeting, held in Ann Arbor, MI on May 15 (see *MWN*, M/A92). Liboff was cited for his "pioneering work" on EMF bioeffects....Jesse Russell Sr., the director of AT&T Wireless Systems & Services Architecture Center at Bell Labs, has been elected president of the Electromagnetic Energy Policy Alliance. Previously, Russell was the director of AT&T's Cellular Telecommunications Lab....Epidemiologist Dr. Doreen Hill is leaving EPA's Office of Radiation Programs to join Energetics, a consulting firm in Columbia, MD, where she will



work on EMFs with Ken Klein, a DOE alumnus....Tom Watson of Crowell & Moring in Washington, DC is profiled in the May issue of *The Washingtonian*, under the headline, "Power Player: When Electric Companies Get Sued, They Call the Man in the Lizard-Skin Boots." The profile notes that Watson "now has some 90 U.S. utilities and 80 foreign power companies as clients."...Dr. Irving Selikoff, a leading researcher on the hazards of asbestos, died May 20. At Mt. Sinai Medical Center in New York City, Selikoff initiated one of the first studies on the reproductive risks of VDT EMFs (see *MWN*, Jun85).

## RESOURCES

**Video on Undergrounding...**Tom Maney has produced a video that makes a case for the economic benefits of burying power lines. Maney, a professor emeritus of electric power engineering at the University of Kentucky, concedes that the construction costs of burial are greater than those for stringing overhead lines. But he argues that when the economic impacts of contact injuries, power outages, chemical pollution from treated poles, car accidents with poles and losses in property values are factored in, burial is the preferred option. The 45-minute video, which is very much like a college lecture—Maney presents his argument in a series of charts—is available for \$20.00 from: Tom Maney, 116 Methodist Ave., Fort Walton Beach, FL 32548, (904) 243-7200.

**EMFs and Land Use...**The American Planning Association (APA) has published *Electromagnetic Fields and Land-Use Controls* by Dr. Louis Slesin and Matthew Connelly of *Microwave News* and David Bergman of the APA. (Connelly is now a doctoral candidate at Yale University.) The 20-page report, No.435 in APA's Planning Advisory Service (PAS) series, is available for \$24.00 (\$12.00 for PAS members), plus \$5.00 postage and handling, from: APA, 1313 East 60th St., Chicago, IL 60637, (312) 955-9100.

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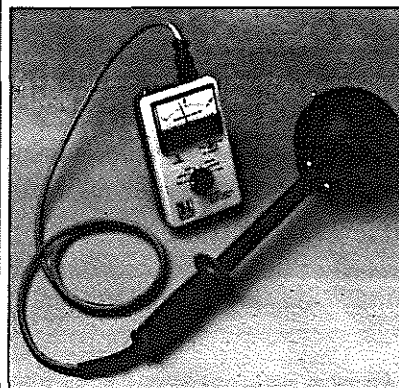
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**1991 IEEE RF/MW Limits Challenged...**Hammett & Edison (H&E), a consulting engineering firm in San Francisco, CA, is opposing ANSI's adoption of the 1991 IEEE safety limits for exposure to RF/MW radiation (see *MWN*, N/D91). "We feel that...the proposed standard would cause significant, and entirely unwarranted, hardships to VHF low-band television stations and to FM stations below 100 MHz," H&E's Dane Ericksen told *Microwave News*. In an April 17 letter to the IEEE, Ericksen complained that H&E saw "no scientific justification for the selection of 100 MHz as a cut-off point" for induced body currents (his emphasis). "If the IEEE C95.1 standard is left unchanged, one has the nonsensical situation of having a conducted body current limit for a 3 kW Class A FM station at 99.9 MHz, but no limit whatsoever for a 100 kW Class C FM station at 100.1 MHz," Ericksen wrote. He asked that the body current limits only apply up to 40 MHz. In response to an earlier letter from H&E, Dr. Om Gandhi of the University of Utah, Salt Lake City, the cochair of the subcommittee that developed the 1991 standard, replied that the "safety guidelines are based on the science of coupling of [EMFs] to humans" and that the "subcommittee decided not to get involved in proposing safety guidelines by industry or applications." H&E has sought to clarify RF rules in the past (see *MWN*, S/O87 and S/O89).

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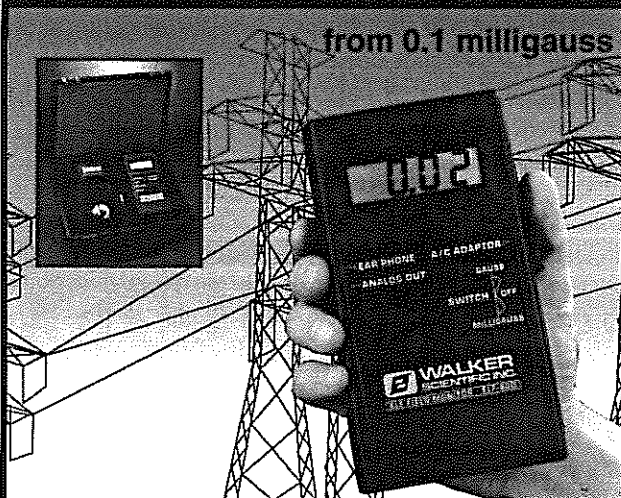


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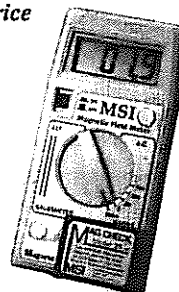
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