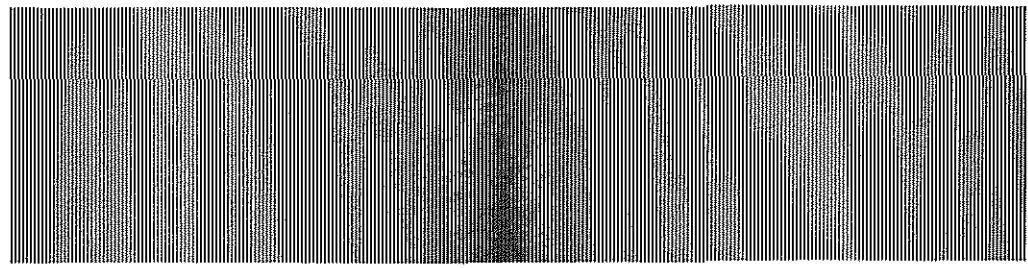


# MICRO WAVE NEWS



Vol. I No. 2

A Monthly Report on Non-Ionizing Radiation

February 1981

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*An investigation by federal officials failed to identify a connection between a cluster of cancer cases among a group of AT&T long lines workers at Ragerville, Ohio and microwave radiation.*

See CWA Cancer Cluster, page 2.

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Microwave News invites letters from its readers. We ask writers to be brief, and we reserve the right to edit contributions for length.

A list of recently published reports appears on page 8 of this issue. This feature will alternate with the conference calendar which will run again next month.

## MICROWAVE-DRUG SYNERGY

Every time a new microwave effect is reported, subsequent research produces a host of conflicting and contradictory results. The latest example of this phenomenon is synergy between tranquilizing drugs and microwave radiation, a topic which stimulated much interest at the September Bioelectromagnetics Society (BEMS) meeting in San Antonio. Recent experimental data have thrown previous proposals about drug-microwave interactions into disarray.

In spring 1979, John Thomas, Linda Burch and Stephen Yeandle of the Naval Medical Research Institute published a paper in *Science* (203, 1357, 30 March 1979) showing that pulsed 2.45 GHz radiation enhanced the action of chlordiazepoxide, better known by its brand name, Librium. Librium, one of the most popular drugs on the market, is a close structural relative of diazepam or Valium,  
*(continued p. 5)*

## Wall Street Tunes In

New uses for electromagnetic radiation are hot news, if *The Wall Street Journal's* regular Friday column on technology is any gauge. In recent months the column has featured five innovative applications.

Two products are already on the market. The October 31 column headlined induction stoves that use a magnetic field to heat any cookware containing iron. Manufacturers claim induction is a cool, energy-efficient way to cook and they forecast large sales for the appliance. The popularity of microwave ovens might be the basis for their optimism. The ovens are already a commercial success, but a new feature, announced January 16, might entice even more buyers. Some Panasonic models now offer a humidity sensor that allows the oven's microprocessor to adjust cooking time and power level.

(In a story appearing December 10, the *Journal* noted that the Department of Energy's pending minimum efficiency standards for major appliances may speed the development of talking microwave ovens. Manufacturers will add sophisticated electronic controls that increase product convenience, efficiency, and reparability to compensate for energy-saving demands that impair performance. The Sanyo Electric Trading Company has already developed an oven that can announce its power setting.)

These advances in the kitchen have outpaced the microwave plans of the auto industry. An anti-collision radar system and a new method for producing "lean burning" engines are two applications whose time has yet to come. An update on a long-dreamed-of radar system to warn drivers of approaching trouble ran on August 1. Six weeks later a less spectacular, but potentially more valuable, idea made the news: by simulating a flame inside the engine, microwaves can help fuel burn more efficiently without producing extra pollution.

The November 7 Technology column highlighted a truly big idea: the possibility of turning the sea around Cape Cod into a giant antenna for submarine communications—a potential substitute for the Navy's hard-to-site ELF antenna, Project Seafarer. Stanford University scientists are working on this concept.

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# UNIONS AND WORKERS

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## CWA Cancer Cluster

An investigation by federal officials failed to identify a connection between a cluster of cancer cases among a group of AT&T long lines workers at Ragerville, Ohio and microwave radiation, according to a soon-to-be-released National Institute for Occupational Safety and Health (NIOSH) report.

Word of the cluster emerged early last year when James Cole, president of Communications Workers of America local No. 4354, requested an investigation of five cancer cases, including two deaths, among a group of eight workers. In addition to checking microwave radiation levels, Cole asked for an examination of possible polychlorinated biphenyl (PCB) and asbestos contamination, and tests of drinking water wells at the site.

Of the five cases, four were company employees, and the fifth was a cleaning woman, working for a contract service. Three of the employees developed colon cancer, and the fourth had cancer of the larynx. The cleaning woman and one of the colon cancer cases died.

A team from NIOSH and the Occupational Safety and Health Administration (OSHA) made a site visit last March. Bob Curtis of OSHA surveyed microwave and radiofrequency radiation levels, but found no indication of excessive exposures. Checks for PCB's and asbestos and Ames tests of drinking water samples were also negative.

Dr. Sandy Leffingwell, an epidemiologist with NIOSH's Division of Surveillance, Hazard Evaluation and Field Studies, found that this was an unusual but accidental cluster of cases, not related to the work site, but noted that "we really don't know what we are dealing with here." Leffingwell stated that 18 people had worked at the local over the last ten years, and that the first cancer had been identified in the early 1970's.

Cole believes that there must have been some kind of microwave or carcinogenic hazard at the work site: the source has either been eliminated or is still there. "I suspect there could still be a hazard, but we aren't sophisticated enough to measure it or find it," he said. Only three people are now working at the Ragerville site; the cut back is unrelated to the cancer cluster, according to Cole.

Cole said that the maximum NIOSH reading was 0.1 mW/cm<sup>2</sup>, but he stressed that the levels could be higher, depending on working conditions. "New technology and design have decreased the levels in recent years," he added. He said that when he worked at the station years ago, the exposure levels were probably much higher.

That possibility was confirmed by Bob Curtis, who noted that the exposures at the local could have been higher before the equipment had been converted to solid state. Previously, the equipment required more maintenance, which could have resulted in greater exposures. "Today, the exposures would be lower," he said, "unless the worker cuts into a hot waveguide, and even then the exposure would be for a short duration."

The radiation at the long line local would have been in the 2-10 GHz range, according to Curtis. He stressed that retrospective predictions on worker exposures are notoriously difficult.

Leffingwell said that further epidemiological investigations of long line workers would be frustrated by the way AT&T kept

its employment records. No additional studies are now planned.

The NIOSH report should be released by the end of February, depending on the backlog at the NIOSH printer.

## NIOSH Epidemiology

NIOSH is about to begin its long-planned epidemiology of workers exposed to RF radiation from heat sealers.

Terry Leet and Dr. Sherry Sullivan, two epidemiologists in NIOSH's Cincinnati office, and Clinton Cox, an industrial hygiene engineer, were about to select a suitable study population at the end of January. Results will not be ready for publication before the end of 1982.

The NIOSH team had already made 10 to 15 surveys of workers exposed to RF sealers in various plants.

Leet has taken over from Elizabeth Egan who worked on the study since 1979 and has now left NIOSH to go to medical school.

## Medical Surveillance

Researchers at the Rocky Mountain Center for Occupational and Environmental Health at the University of Utah have just completed a study on recommended medical examinations for workers exposed to non-ionizing radiation.

The report, *An Evaluation of Medical Surveillance for Workers Exposed to Microwave/Radiofrequency Radiation*, was submitted to the Occupational Safety and Health Administration's (OSHA) Health Response Team office in Salt Lake City. It will now be reviewed in Utah and in Washington and be available for distribution in a few weeks.

Dr. Mark Nichols, a resident at the Center, and Dr. Bill Rom, its Director, wrote the study for OSHA. Recommendations include a list of tests that should be administered annually to chronically exposed workers or to persons who have experienced high-level, acute exposures.

## Mount Sinai Epidemiology

Drs. Arthur Frank and Robert Refowitz, two members of Dr. Irving Selikoff's Environmental Sciences Laboratory at the Mount Sinai Medical Center in New York City, are planning an epidemiology of workers exposed to microwave radiation.

As a first step in identifying a suitable study population, Frank and Refowitz, working with behavioral toxicologist, Jose Valcuikas, are designing a questionnaire to assess workers' problems related to non-ionizing radiation. A separate, though related, questionnaire is planned for workers exposed to microwave radiation, radiofrequency radiation, video display terminals (VDT's), and, in the future, lasers.

A sample questionnaire is now being tested among communication workers. The presidents of the 40 long line locals of the Communication Workers of America were sent the survey in order to learn about the CWA membership and any special complaints they may have. The Mount Sinai researchers are anxiously awaiting the responses.

Frank and Refowitz are interested in possible radiation effects on the eyes and the reproductive system of exposed workers, as

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well as neurobehavioral changes. In addition, they would like to test the hypothesis that males exposed to non-ionizing radiation have a much greater tendency to father female children.

The Mount Sinai group is thinking about holding a research conference on microwave radiation late this year or next year.

### **WISH Seminar**

Trade union representatives from around the country participated in the Worker Institute for Safety and Health (WISH) seminar on non-ionizing radiation and laser hazards last September 7-10 in Park City, Utah. Among the labor groups present were the Communication Workers of America, the International Union of Operating Engineers, the United Brotherhood of Carpenters, and the Newspaper Guild.

Other participants included Sheldon Samuels from the Industrial Union Department of the AFL-CIO, Arthur Frank from Mount Sinai, Walter Gundaker from BRH, Bob Curtis from OSHA, and Paul Brodeur, who wrote the briefing manual for the meeting, *The Health Hazards of Radiofrequency, Microwave, and Laser Radiation*.

All 110 attendees supported the following resolution on microwave/radiofrequency radiation standards:

WHEREAS numerous U.S. industries have demonstrated callous disregard of the hazards posed to their employees by the rapidly spreading use of equipment producing microwave and radiofrequency radiation, and

WHEREAS the existing OSHA standard of 10 milliwatts per centimeter squared is generally recognized as totally inadequate to protect workers against these hazards, and

WHEREAS NIOSH and ANSI (management's standard setting organization) are in the process of recommending that the standard be lowered to one milliwatt per centimeter squared for the most hazardous part of the microwave/radiofrequency spectrum and

WHEREAS the guideline in Russia and some other countries ranges from 10 to 200 microwatts per centimeter squared, far below even the recommended U.S. standard,

THEREFORE, BE IT RESOLVED THAT this WISH seminar of trade unionists representing workers employed in a number of these industries urges OSHA to promptly lower the standard, not merely to the inadequate level proposed by NIOSH and ANSI, but to a level that will give US workers protection at least equal to that enjoyed by those of any other country, and

BE IT FURTHER RESOLVED THAT OSHA be urged to vigorously enforce its radiation standards.

Future WISH activities include co-sponsoring a training course in Ohio next month and developing questionnaires for persons working with microwave/radiofrequency and VDT radiation, in collaboration with Dr. Frank.

### **Ohio Training Course**

There will be a one-day training course on microwave and radiofrequency radiation and lasers at Ohio State University in Columbus on Saturday March 14th.

The course, sponsored by the Labor Education and Research

Service of OSU and the Ohio AFL-CIO in cooperation with the Workers Institute for Safety and Health (WISH), the Industrial Union Department of the AFL-CIO, the CWA, the Carpenters, and the Operating Engineers will be similar to last September's WISH seminar (see story above). But given the limited time available, the schedule will be somewhat shortened. The morning session will focus on the types of health effects associated with non-ionizing radiation, and the afternoon will consist of workshops on the measurement and control of radiation hazards. Paul Brodeur is the tentatively scheduled luncheon speaker.

For more information, contact the course organizer, Jack Pompei, an industrial hygienist with the Labor Education and Research Service, at 614-422-8157.

### **NBC Precautions**

Last spring a National Broadcasting Company report recommended that radiation-warning signs be posted on transmitting antennas of minicam trucks and that working personnel avoid positioning themselves within 6 feet of an antenna in the direction of its beam. The study, completed by the NBC Engineering Department in New York City with assistance from the Occupational Safety and Health Administration, was requested by Local 11 of the National Association of Broadcast Employees and Technicians.

As of January 1981, NABET officials have yet to see the report, although NBC has assured them that all measurements were below OSHA guidelines. Some, but not all, of the mobile units now have warning signs. The action only affects New York City operations and personnel.

### **CWA Training Session**

The Communication Workers of America held the first of a series of training programs on occupational safety and health in New York City last January 12-16. Some 85 local union officials learned about the risks associated with VDT's and microwave and radiofrequency radiation, among other topics. The meeting was held in cooperation with Cornell University's School of Industrial and Labor Relations.

On the subject VDT's, the union representatives heard Michael Smith of NIOSH, David Eisen of the Newspaper Guild, and Tobi Bergman of the New York Committee for Occupational Safety and Health (NYCOSH). Smith presented some results from the NIOSH survey of VDT's in San Francisco. The complete report is due to be published soon. Eisen described the Guild's contract negotiations to guarantee its members better ways to work with VDT's. Bergman highlighted NYCOSH's efforts to bring companies and employees together on VDT problems. (Last year, NYCOSH published a booklet on VDT's: *Health Protection for Operators of VDTs/CRTs*.) After these presentations, the meeting broke up into workshops, which focused primarily on ergonomic issues.

Robert Curtis and Alfred Owyang of OSHA gave lengthy presentations on microwave/RF and laser hazards in the workplace.

CWA is organizing three more training sessions. Two will be held in May—in Columbus, Ohio and in Birmingham, Alabama. The final one will be in San Francisco next August.

## DIATHERMY COMMENTS

### Comments on the Proposed BRH/FDA Standard for Diathermy Products

The proposed performance standard for microwave diathermy products (45 *Federal Register* 50359, July 29, 1980) elicited 17 sets of comments last fall. The standard is designed to guarantee the safety and effectiveness of microwave therapeutic heat treatment and includes the following key provisions:

- a diathermy product must be capable of delivering a specific absorption rate of 235 W/kg to standardized phantoms.
- a device may not leak more than 10 mW/cm<sup>2</sup> at 5 cm from the applicator.
- equipment manufactured before the effective date of the standard is excluded from regulation.
- microwave diathermy products used for cancer therapy (hyperthermia treatment) are included under the standard, though variances could be granted. (The Bureau was particularly interested in receiving comments on such exemptions.)

Comments were due September 29, 1980, though the deadline for written submissions was extended a few weeks.

The following is a brief synopsis of the comments received by the Bureau of Radiological Health. The comments were obtained by *Microwave News* through the Freedom of Information Act.

#### Cancer Therapy

The appropriateness of regulating cancer treatment devices was addressed in a majority of the comments. The response of the **RCA Corporation**, which urged exemption for experimental devices used in hyperthermia treatment, was typical of the criticisms received. **George Kiessling**, Director of Product Safety Plans and Programs, concluded that "applying the regulations to microwave hyperthermia research devices would have the effect of substantially impeding valuable research into the thermal treatment of tumors." He did recognize that regulation of commercial microwave diathermy products, as proposed, is desirable.

The **BSD Corporation** of Salt Lake City also found the proposed standard reasonable for physical therapy devices but not for cancer treatment units.

**Dr. Francis Mahoney**, Program Director for Radiation at NIH's **Division of Cancer Treatment**, wrote that the standard would be overly restrictive for units intended for cancer therapy research.

**Drs. Haim Bicher, Fred Hetzel, and Taljit Sandhu** from the **Henry Ford Hospital's** Department of Therapeutic Radiology discussed specific problems with applying the standard to cancer therapy. Treatment frequencies, power density limits, and various safety controls were found unacceptable or inappropriate for cancer treatment.

Professor **John Fazekas**, of **Thomas Jefferson University Hospital**, expressed his doubts about the desirability of applying the standard to cancer therapy. He felt safety in clinical hyperthermia hinged on experienced and knowledgeable investigators.

#### University of Washington Medical School

Three separate sets of comments were received from the University of Washington School of Medicine. Professors **Arthur Guy** and **Justus Lehmann** both stated that a performance standard for equipment used in cancer therapy is a poor substitute for competency of the professionals overseeing treatment. Dr. Guy would have preferred an exposure standard to a performance standard: "It is very naive to think a performance standard based on very limited models will be a substitute for the required complex interdisciplinary judgments coupled with the ap-

plication of well-developed exposure guidelines in reducing the dangerous side effects for the patient and the equipment operators."

Dr. Lehmann accepted the standard for standardized applications but said it does not provide adequate safeguards against overexposure of the patient or the operator: "We feel that it is essential that the standard include limitations as to the use of this equipment so that it can be used only either under the direct supervision of a knowledgeable physician, or by a knowledgeable physical therapist."

The third response, from Professor **C.K. Chou**, stated that, while it was desirable to eliminate unnecessary radiation exposures, "the usefulness of diathermy will be reduced by an over-restrictive performance standard."

#### Operator Risks

The **American College of Radiology** stressed that operators giving hyperthermia treatments must have sufficient knowledge and training but opposed regulating the equipment: "As a new developing treatment, it is important that physicians with special expertise supervise microwave diathermy treatments for cancer." The group thought regulations for operators should be set as soon as possible.

Both **Dr. Carlos Perez**, of the **Washington University School of Medicine**, and **Dr. Ned Hornback** of **Indiana University's** Department of Radiation Oncology expressed similar opinions. Dr. Hornback advised that, "the exposure levels of all personnel operating equipment should be included in the regulations and current accepted levels of exposure should be adhered to."

#### Standard Physical Therapy

The need for regulation of existing equipment, which is exempt from proposed regulation, was expressed by **Dr. Julian Henley-Cohn** and by **Dr. Louis Slesin** and **Martha Zybko**. Henley-Cohn argued against imposing the standard on cancer treatment devices. Slesin and Zybko questioned the wisdom of the FDA decision to double the proposed leakage limit from 5 mW/cm<sup>2</sup> in an earlier draft of the rule to 10 mW/cm<sup>2</sup> in the current draft.

**John Osepchuk**, consulting scientist for the **Raytheon Company**, and **Robert Kruse**, President of **AAMED, Inc.**, of Forest Park Illinois, opposed the standard as an unnecessary and harmfully restrictive measure. Dr. Osepchuk stated that the FDA has not established the need for a standard and that this regulation would create an adverse economic impact on the industry.

The **American Physical Therapy Association** supported the standard and in addition requested "immediate attention be focused on requirements essential for operators of microwave diathermy products" to insure the patient's safety.

**Drs. G.M. Samaras** and **R.G. Slawson** of the **Martha V. Filbert Radiation Center** at the **University of Maryland Hospital** supported the standard "for all microwave diathermy products, regardless of their proposed clinical application." The 30 minute maximum timer period, however, was deemed an impractical restriction for cancer treatment diathermy.

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## MICROWAVE-DRUG SYNERGY

(continued from p. 1)

the country's largest selling tranquilizer with some eight million prescribed users and many more unofficial ones. Thomas's widely circulated report caused considerable agitation; if low levels of radiation from a typical radar could intensify the action of a common drug, a new significant risk might exist. Soon a number of other labs were busy trying to replicate and extend Thomas's experiment. (See Table.)

### Librium v Valium

At the September conference, Robert Johnson presented the findings of Professor A.W. Guy's group at the University of Washington Medical School. Funded by the Office of Naval Research, they repeated Thomas's experiment using Valium. With the same pulsing characteristics, frequency and average power levels, they found a 30 to 40 percent reduction in sleeping time and an increase in animal feeding. These results were in line with what was expected. However, a few minutes later, John Schrot, a member of Thomas's research team, reported that they had also tested Valium and found *no* microwave-drug synergy. To make matters more complicated, Thomas had also tried continuous wave instead of pulsed radiation and had again found no synergy. (Some of these results have recently been published: *Neurobehavioral Toxicology*, 2, 131, 1980.)

Many biological effects occur at lower power levels for pulsed as compared to continuous radiation, so the failure to get a positive result after continuous wave exposure was not so startling. But a difference between Valium and Librium, very similar drugs

belonging to the benzodiazepine drug family, defied simple explanation. As Thomas wrote in his abstract: "The lack of interaction between diazepam and the pulsed microwave field suggests that drug class alone does not adequately predict outcome."

Robert Johnson offered the hypothesis that two distinct processes were at work in the synergy. In the first week of irradiation, the microwaves counteract the debilitating action of Valium, followed by appetite stimulation during the second week. Nevertheless, he and his colleagues at the University of Washington will be doing some reassessing in light of the conflicting results presented in San Antonio.

### Replications Attempted

Even Thomas's original experiment did not survive the meeting unchallenged. G. Rufus Sessions of the Department of Microwave Research at Walter Reed Army Institute of Research reported that he had failed to replicate the Librium study using higher power densities (10 and 20 mW/cm<sup>2</sup>). His experimental design was quite different, however. Sessions used a variable interval performance test and 915 MHz radiation. These changes could explain the lack of response.

In an interview at the Naval Medical Research Institute last October, Dr. Thomas noted that he had successfully replicated the Librium synergy experiment. He admitted that he had been surprised by the failure to get a positive result with Valium, and offered as a possible explanation an animal's different response to the two drugs. Librium will increase its response rate as compared to baseline behavior, while Valium has an opposite effect.

(continued p. 6)

Summary Table of Microwave-Drug Experiments

Study	Type of Study	Power Density mW/cm <sup>2</sup> (average)	Frequency	Type of Field	Drug	CW/PW	Results
Thomas (1979)	F.I. Feeding	1.0	2.45 GHz	Near	CDZ	2usec, 500pps	Enhanced Behavioral Effect
Thomas (BEMS)	F.I. Feeding	1.0	2.8 GHz	Near	CDZ DZ DZ CPZ	CW 2usec, 500pps CW 2usec, 500pps	No Effect No Effect No Effect No Effect
Guy (BEMS)	Feeding & Sleeping	1.0	2.45 GHz	Circularly Polarized	DZ	2usec, 500pps	30-40% Reduction in Sleeping Time Increase in Feeding
Battelle (BEMS)	F.I. Feeding	1.0	2.88 GHz	Far	CDZ	3usec, 300pps	None Yet (see text)
Sessions (BEMS)	V.I. Feeding	10 & 20	0.915 GHz	Circularly Polarized	CDZ	2usec, 500pps	No Effect

F.I. = Fixed Interval; V.I. = Variable Interval  
 CDZ = Chlordiazepoxide (Librium); DZ = Diazepam (Valium); CPZ = Chlorpromazine (Thorazine)

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## GOVERNMENT

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### CONGRESS

The Library of Congress' Congressional Research Service (CRS) has published "High Voltage Electric Power Transmission Lines: Impact on Public and Environmental Health" by Kenneth Bogen (Report No. 80-199, November 7, 1980). The 20-page report includes a detailed chronology and bibliography. Bogen has also updated a six-page "Mini Brief" on this subject—with the same title (Number MB80222, December 9, 1980).

The CRS is planning a similar report on the potential hazards associated with extremely low frequency radiation emitted by the Project Seafarer antenna, the Navy's proposed submarine communication system. The schedule for completing this study will depend on Congressional interest.

### AGENCIES

#### Federal Aviation Administration

Plans are underway for phasing in the Microwave Landing System (MLS) which will replace the Instrument Landing System (ILS) now used at airports to guide planes during poor visibility conditions. The MLS operates at frequencies above the VHF/UHF frequencies used in ILS.

The new system offers four essential advantages over the ILS: 1. a common system for civil and military use; 2. a frequency band that will be free of frequency congestion problems; 3. a system that provides a high quality guidance signal that is relatively free from local terrain and structure effects; and 4. an ability to provide multiple paths for various classes of aircraft.

The total estimated cost in today's dollars of the MLS including aircraft equipment exceeds \$2 billion according to Martin

Olson, Chairman of the MLS Transition Plan Working Group. A few selected airports could have the MLS by 1985.

FAA held four public, regional hearings this January to elicit comments and suggestions on how to proceed with the major task of phasing in the MLS throughout the US. Written comments were due by February 10 (45 *Federal Register* 75041, November 13, 1980). Olson reported that all hearing participants supported the new system: "Generally, people felt MLS offers a beneficial technology that should be implemented as soon as possible."

FAA has released a number of reports on the MLS:

1. *An Analysis of the Requirements for, and the Benefits and Costs of the National Microwave Landing System (MLS)*, by William C. Reddick *et al.*, June 1980, in 2 volumes (Report No. FAA-EM-80-7). A brief "Executive Summary" of the report is also available.
2. *The Microwave Landing System Transition Plan, Draft*, October 20, 1980, 203 pages.
3. *Guide to Microwave Landing System Implementation Strategies*, November 1980, 15 pages.

For additional information write to: Mr. Marvin Olson, APO-320, Chairman, MLS Transition Plan Working Group, FAA, Room 939, 800 Independence Avenue, SW, Washington, D.C. 20591

#### Federal Communications Commission

On January 19th, the FCC reallocated 130 MHz of radio spectrum to allow the development of a Digital Electronic Message Service (DEMS). The new service will provide business and government offices with a two-way, data and document communication system within and among major US cities.

The intercity transmissions will be authorized under existing FCC rules for point-to-point and satellite microwave links. The

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## MICROWAVE-DRUG SYNERGY

(continued from p. 5)

Originally Thomas had intended to test a few representative members of each major drug class, but has had to redesign his work plan. Soon he will do a run with a new tranquilizer, still in pre-clinical testing, with a structure falling roughly between that of Librium and Valium. In 1981, Thomas's lab will begin to experiment with monkeys.

A fourth group, at the Battelle Pacific Northwest Laboratories, is specifically trying to replicate Thomas's Librium experiment. Apart from small changes in frequency and pulsing parameters, a major difference in the Battelle study design is the use of far field instead of near field exposures. This experiment by R.H. Lovely and R.D. Phillips had just begun in September, and no firm results were reported in San Antonio. In a December telephone interview, Dr. Lovely said that he had finished two complete runs at 1 mW/cm<sup>2</sup> and found no synergistic action. The next step is to increase the power to 4 or 8 mW/cm<sup>2</sup>. If a field of 8 mW/cm<sup>2</sup> causes too much disruption for the animal, the

group will use 4 mW/cm<sup>2</sup>. If no synergy is found at the higher power level, Lovely will go to exposures in the near field.

#### Other Drugs

Thomas's *Science* paper was not the first report of drug-microwave synergy. Cleary and Wangeman showed reinforcement between pentobarbital and continuous wave microwaves in 1975, and Servantie and co-workers found that microwaves affected the action of curare-type drugs in 1974. In late 1979, Thomas published a paper showing synergy between pulsed microwaves and dextroamphetamine (*Radio Science*, 14, 253, 1979). In San Antonio, Thomas reported no synergy between pulsed radiation and Thorazine (chlorpromazine).

The Navy program on the interaction between microwaves and common drugs is part of a long-term risk assessment for servicemen simultaneously exposed to multiple physical and chemical agents aboard ship.

Where are we now? As Elliot Postow, whose office at the Navy Medical Research and Development Command is funding both Thomas and Battelle, put it: "no clear picture is emerging, and at this point, all bets are off."

intracity links will be handled by the new Digital Termination Systems (DTS).

The FCC decision is the result of a 1978 petition by the Xerox Corporation for spectrum space for a new common carrier service. Under the proposed Xerox system, a customer's terminal would feed into a transceiver connected to a rooftop antenna. The antenna would be in two-way communication with a city-wide substation. A narrow microwave beam would connect the substation to an earth station for transmission to other cities.

The reallocation affects frequencies between 10.55 and 10.68 GHz. The Commission is also considering allocating space in the 17.7-19.7 GHz band for DTS.

Litton Industries had also wanted to use the 10.6 GHz area for a new microwave oven. Litton claims that this higher frequency (most ovens operate at 2.45 GHz), does a better job of browning meat and heating small amounts of food.

Neighboring spectrum space in the 10 GHz region is allocated to police radar, radioastronomy, and point-to-point radio services.

Other companies that have filed for experimental licenses for DEMS-type systems are Digital Communications Corporation and Federal Express. The Commission is reserving some spectrum space for small companies.

The decision will be published in the *Federal Register* within a few weeks. A final rule for the DTS, first proposed in August 1979, will appear as an appendix to the FCC decision.

### Federal Trade Commission

The FTC banned Litton ads that claim its microwave ovens are preferred by independent service technicians. The January decision upholds last year's findings of an Administrative Law Judge that the company's surveys of technicians were biased and misleading. The Commission also provided some guidelines for properly using surveys in advertising.

The ads, which ran from 1976 to 1978 in more than 100 national and local newspapers and magazines, stated that technicians chose Litton ovens over other brands. For example, copy placed in a November 1976 issue of *Newsweek* declared: "Quality is No. 1 at Litton! 76% of the independent microwave oven service technicians surveyed recommend Litton." Only authorized Litton service agents were interviewed, however.

The Commission's Opinion is available from the Public Reference Branch, Room 130, FTC, 6th Street and Pennsylvania Avenue, NW, Washington, DC 20580, (202) 523-3598.

### National Highway Traffic Safety Administration

NHTSA has proposed performance standards for speed measuring radar devices used by the police (46 *Federal Register* 2097, January 8, 1981).

The standards, developed for NHTSA by the National Bureau of Standards, specify performance requirements for transmission frequency, frequency stability, input current stability, output power stability, and the width of the antenna beam. Each device would have to be free of erroneous signals in the presence of CB and police radio signals and other interfering sources.

According to the NHTSA notice, the standards are designed

to diminish litigation over the devices' reliability and accuracy.

For further information contact: Ronald Engle, Enforcement and Emergency Services Division, NHTSA, 400 Seventh Street, SW, Washington DC 20590, (202) 472-4913.

### National Institute for Occupational Safety and Health

NIOSH received 81 responses to its RFQ for two television scripts on the risks associated with VDT's. Rather than evaluate all those submissions, NIOSH withdrew the proposal. According to Ray Sinclair of NIOSH's Division of Training and Manpower Development in Cincinnati, the writing will now be done in-house, with a little help paid for on a purchase order basis. The TV shows are due to be completed by October 1, 1981.

### National Telecommunications and Information Administration

The Electromagnetic Radiation Management Advisory Council (ERMAC) has postponed its February meeting. One reason for the delay is that the advisory committee's charter, which ran out last December, must be renewed before a meeting can be announced, according to Janet Healer, ERMAC member and NTIA Program Manager for non-ionizing radiation. It is not clear when the paperwork will be completed and the meeting scheduled.

On another front, the hiring freeze instituted by the Reagan administration has put a hold on the hiring of a replacement for Bob Frazier, ERMAC's ex-Executive Secretary, who resigned last year to go work for the Federal Aviation Administration.

ERMAC is assembling all the documents on the irradiation of the US embassy in Moscow released at the last ERMAC meeting (see *Microwave News*, January 1981) together with the ERMAC recommendations. They will be published as a NTIA report.

### Navy

The Naval Surface Weapons Center in Dahlgren, Virginia is seeking better ways to monitor electromagnetic fields aboard ship. Specifically, the Center is soliciting information on ways to (a) measure the E-component of the incident field from all directions and polarizations; (b) measure the H-field component at low frequencies; and (c) measure equivalent power densities for 10 uW/cm<sup>2</sup> to 200 mW/cm<sup>2</sup> in the frequency range 300 kHz to 40 GHz. *Commerce Business Daily*, December 24, 1980 and repeated January 21, 1981.

The Naval Surface Weapons Center in Silver Spring, Maryland may decide to develop a lightweight, expendable S-band, RF transmitter no bigger than 5 inches in diameter and 40 inches in length and weighing no more than 40 pounds. The transmitter would produce at least 25 kW pulsed peak power at about 800 pulses per second and a 3 microsecond pulse width with a 0.0024 duty cycle. The transmitter would be able to survive a 200 G rocket launch.

## NY State Transmission Lines Study

This year the New York State Department of Health (NYSDOH) will begin a 5-year, \$5 million contractual study on the human health effects of electromagnetic radiation from overhead transmission lines.

All program decisions will be made by an administering Board composed of the Commissioner of NYSDOH, and the Chairmen of the Power Authority of the State of New York, (PASNY) and of the Public Service Commission (PSC). An advisory Panel of experts chosen by the Board will determine areas of needed research, review and recommend applications for research contracts, evaluate the progress of funded projects, and write an annual report. At the end of the funding period, currently scheduled for no later than July 1987, the Panel will prepare a summary report for the Board.

The tentative selections for the Panel, as of the end of January, were:

Ernest N. Albert, Ph.D., Professor of Anatomy, The George Washington University Medical Center

Antony C. Fraser-Smith, Ph.D., Senior Research Associate, Stanford Electronics Laboratories

Alan J. Grodzinsky, Sc.D., Associate Professor of Electrical and Bioengineering, Massachusetts Institute of Technology

Michael Marron, Ph.D., Professor of Chemistry, University of Wisconsin Parkside

Alice O. Martin, Ph.D., Assistant Professor of Obstetrics and Gynecology, Prentice Women's Hospital

Michael A. Persinger, Ph.D., Professor of Psychology, Laurentian University

Michael L. Shelanski, M.D., Ph.D., Professor and Chairman, Dept. of Pharmacology, New York University Medical Center

Arthur C. Upton, M.D., Professor and Chairman, Dept. of Environmental Medicine, New York University Medical Center

Edward R. Wolpaw, M.D., Assistant Clinical Professor of Neurology, Harvard Medical School

Dr. Maria Reichmanis, a research physicist at the VA Medical Center in Syracuse, NY, has been hired as the study's Scientific Research Coordinator.

Because Panel selection has taken longer than anticipated, the initial schedule for getting the study underway has been pushed back three months. A request for proposals will be issued by April 1 and funded research projects should begin by October 1. These dates may be revised when the Panel sets the final timetable.

The RFP will be available from Administrator, Overhead Transmission Lines Project, NYSDOH, Division of Laboratories and Research, Empire State Plaza, Albany, NY 12201. Update information on the project will be provided by Dr. David Carpenter, the Executive Secretary and non-voting member of the Panel, NYSDOH, Empire State Plaza, Albany, NY 12201.

## RECENTLY RECEIVED

### BRH

*Publications Subject Index*, Bureau of Radiological Health, November 1980, No. FDA 81-8070. (Covers from 1972.)

### DC Bioeffects

M.J. Frazier and M.M. Preache, *Design, Construction and Testing of a DC Bioeffects Test Enclosure for Small Animals*, Final Report, Department of Energy, November 1980, No. DOE/RA/10157-1.

### Diathermy

P.S. Ruggera, *Measurements of Emission Levels During Microwave and Shortwave Diathermy Treatments*, Bureau of Radiological Health, May 1980, No. FDA 80-8119.

### Dosimetry

C.H. Durney, et al., *Radiofrequency Radiation Dosimetry Handbook*, Third Edition, USAF School of Aerospace Medicine, August 1980, No. SAM-TR-80-32.

### Instrumentation

W.A. Herman and D.M. Witters, Jr., *Microwave Hazard Instruments: An Evaluation of the Narda 8100, Holaday HI-1500, and Simpson 380M*, Bureau of Radiological Health, June 1980, No. FDA 80-8122.

### Solar Power Satellites

L. David, *A Study of Federal Microwave Standards*, Department of Energy, August 1980, No. DOE/ER/10041-02.

Institute for Telecommunication Sciences, *Environmental Assessment for the Satellite Power System-Concept Development and Evaluation Program-Effects of Ionospheric Heating on Telecommunications*, Department of Energy, August 1980, No. DOE/ER/10003-T2.

*Program Assessment Report: Statement of Findings*, Satellite Power Systems Concept Development and Evaluation Program, Department of Energy, November 1980, No. DOE/ER-0085.

C.M. Rush, et al., *Impact of SPS Heating on VLF, LF, and MF Telecommunications Systems Ascertained by Experimental Means*, Department of Commerce, April 1980, No. NTIA-R-80-37.

A.R. Valentino, *Environmental Assessment for the Satellite Power System (SPS) Concept Development and Evaluation Program (CDEP)*, Department of Energy, August 1980, No. DOE/ER-0069.