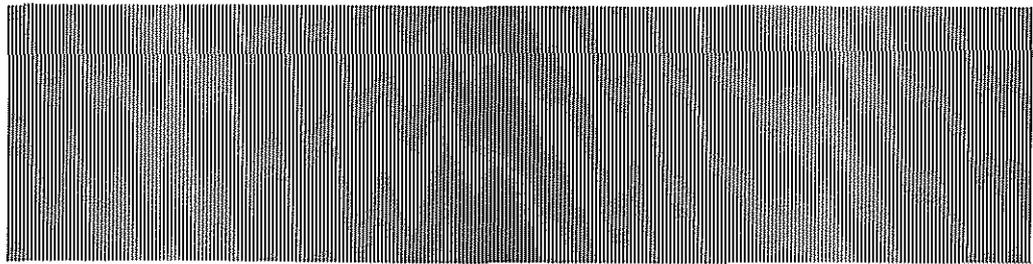


MICRO WAVE NEWS



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A Monthly Report on Non-Ionizing Radiation

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1982 RF/MW Litigation Survey

Litigation over siting new radiofrequency and microwave (RF/MW) installations is on the rise, according to our 1982 case survey. Companies and local residents have turned to the courts to resolve disputes in four states. With many other siting applications now meeting local opposition, these cases may well mark the beginning of an important new trend.

The survey also reveals that most product liability claims are still being settled out of court, following the pattern reported in last year's survey (see *MWN*, April 1981). Several plaintiffs have dropped suits in exchange for settlements which stipulate that the terms remain confidential. The Delsesto and Spinella microwave oven case, for example, was dismissed with the consent of both parties after one day of trial last March: neither side would discuss the details. And news of the Karras \$200,000 settlement for various severe injuries he claims resulted from working on radar leaked out months after the suit was quietly dropped last year.

The announced pre-trial settlements of the Kerch case for \$30,000 this spring and the Foley case for \$25,000 last year were exceptions to the rule. Both men alleged radiation-induced cataracts from exposure to radar. New cataract claims were filed late this year by former radar technicians Coatney and Becker.

Because no radar case has yet been decided by a jury, lawyers are closely watching the Engell suit against ITT, which is scheduled to go to trial this month. Lawyers for Robert Engell, a former radar technician who now has cancer, settled out of court with four other defendants this November, agreeing not to discuss the awards.

The major occupational exposure case to come before a workers' compensation board is now closed. This year a New York state appeals court upheld Antoinette Yannon's award for the death of her husband. Mrs. Yannon successfully maintained her husband's death was caused by chronic radiation exposure while tuning television relay equipment for New York Telephone. In a separate action, Mrs. Yannon is appealing the dismissal of her product liability suit against RCA, a manufacturer of relay equipment.

In litigation against the US government, George Watson has appealed the dismissal of his claim that he suffered genetic damage from exposure to microwaves at the US embassy in Moscow, which caused birth defects in his son. Other embassy cases are still pending.

Plaintiffs in several cases reported this year have turned to the Microwave Radiation Information and Action Center (MRIAC) for assistance. (See *MWN*, September 1981.) J. Stuart Lemle reports that the center is no longer a membership organization, but is now offering consulting services. Lemle is handling one of the Moscow embassy cases.

Summaries of over 30 cases, which are either in progress or have been recently settled, appear on pp. 2-4 and are followed by a list of participating attorneys. (The names of attorneys who are on the list appear in italics in the case summaries.) Included whenever possible are counsel for both plaintiffs and defendants and case numbers. Because a number of attorneys refuse to discuss litigation, however, the list is not complete. ☐

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

1982 RF/MW LITIGATION SURVEY: CASE SUMMARIES

Siting Cases

In Progress:

• RCA Americom filed suit against Kitsap County, WA, and its Board of Commissioners on November 17, 1982. Claim: no basis to indicate that Americom's proposed satellite communications station poses health hazards. Specific information submitted by Americom not considered in board deliberations. Company wants court to set aside board ruling denying company's application and to direct county to issue permit. Status: county deputy prosecutor ordered application returned to board on December 3. Board must now reconsider all material and issue another ruling. Attorney for plaintiff: *William Rives*. Attorney for defendant: Patricia Shafer, Kitsap County, WA, deputy prosecutor. See *MWN*, May, July/August and November 1982. [*RCA American Communications v. Kitsap County*, State Superior Court for Kitsap County, Port Orchard, WA, No. 82-2-01177-2.]

• Vashon for Quality Environment (local citizens group) filed a petition against the King County Council, WA, the County Zoning and Subdivision Examiner and Alascom Inc. in October 1982 to block further construction of a satellite communications station. Claim: improper procedures followed by zoning examiner in refusing group's appeal of building permit issued to Alascom in September 1982. Also challenging legality of zoning examiner's permit and variance. Seeking review of proceedings and voiding of county action. Status: pending. Attorney for petitioner: *Michael Gillett*. [*Vashon for Quality Environment v. King County et al.*, State Superior Court for King County, Seattle, WA.]

• Carole Halloran and other local residents filed suit against the Coventry, CT, Zoning Board of Appeals and US Transmission Systems, an ITT subsidiary, in May 1982. Claim: board acted improperly in processing ITT application to build microwave relay tower. Citizens seek reversal of board's April 20 approval of tower, which they believe poses a health hazard. Status: trial date expected for early next year. Attorney for plaintiffs: *Lawrence Bates*. Attorney for defendant, ITT: *William Hall*. See *MWN*, June 1982. [*Halloran et al. v. Coventry Zoning Board of Appeals and US Transmission Systems*, State Superior Court for Tolland County, Rockville, CT, No. CV-82-27799.]

• Leo and Muriel Shuerman filed suit against Pacific Telephone and Telegraph in 1980 and amended complaints in September 1980 and August 1981. Claim: point-to-point relay transmitter sited near their property and sending a beam across it renders property valueless and may pose health hazards. Seeking inverse condemnation (PT&T, as a quasi-public agency with power of eminent domain, would be required to buy the property) and \$10 million in punitive damages. Status: trial date set for April 4, 1983. Attorney for plaintiffs: *Joe Aklufi*. See *MWN*, April 1982. [*Shuerman v. Pacific Telephone and Telegraph*, State Superior Court for Riverside County, Riverside, CA, No. 136703.]

• Filmways Communications of Syracuse, NY, filed suit against the town of Onondaga, NY, in November 1981. Claim: town's 1980 moratorium on construction of new broadcast sources infringes on company's first amendment rights. Company, which wants to build a TV station, seeks lifting of ban (see *MWN*, October 1982) and more than \$5 million in damages. Status: pre-trial discovery. Attorney for plaintiff: *Robert Bernius*. Attorney for defendants: *Raymond D'Agostino*. [*Filmways Communications v. Town of Onondaga et al.*, US District Court for Northern District of New York, No. 81-CV-1293.]

• Attorney *Michael Prigoff* is investigating a possible suit against the operator of a "microwave tower" sited in a residential community. Concern in community that long-term radiation exposure is responsible for cluster of various tumors, some cancerous, among residents.

Concluded:

• Cylix Communications Network of Memphis, TN, and Anthony Capodanno lost their appeal of a Township of Haverford, PA, zon-

ing board ruling blocking construction of a low-power satellite communications station in May 1982. Claim: board abused its discretion in denying zoning variance. Status: zoning board ruling upheld. Attorney for plaintiff, Cylix: *John Trevaskis, Jr.* See *MWN*, October 1981. [*Capodanno and Cylix Communications Network v. Zoning Hearing Board of Haverford*, Court of Common Pleas of Delaware County, PA, No. 81-15321.]

• WIXT Television and Albert and Beatrice Peck lost their appeal of an Onondaga, NY, Zoning Board of Appeals decision blocking construction of a TV transmission tower in May 1979. Claim: board's determination was unsupported and arbitrary. Maintained hardship was grounds for land use variance and that tower would pose no health hazards in case filed February 1979. Status: after the judicial review opinion of May 21, 1979, town went on to impose moratorium on new broadcast sources in 1980. Attorney for intervenors in opposition to applicants: *Robert Liegel*. [*Peck and WIXT Television v. Petrie et al.* (Town of Onondaga Zoning Board of Appeals), State Supreme Court for Onondaga County, NY.]

• William Pomeroy's application for a transmitting tower in Lafayette, NY, was denied in 1979. Town ruling cited potential health hazards. Decision followed May 1978 ruling against WIXT proposal by Onondaga, NY (see above). Status: decision not appealed to court. Attorney for intervenors opposed to application: *Robert Liegel*.

• MCI Telecommunications' application for a transmitting tower in Skaneateles, NY, was denied in 1980. Town ruling cited potential health hazards. Decision followed ruling against WIXT proposal by Onondaga, NY (see above). Status: decision not appealed to court. Attorney for intervenors opposed to application: *Robert Liegel*.

Radar Cases

In Progress:

• Robert Engell filed suit against General Dynamics, ITT, Raytheon, Rockwell International and Varian Associates in March 1977. Claim: radiation exposure while working on TACAN and other radars from 1964 to 1975 caused pancreatic cancer. Status: out of court settlements reached with all but ITT in November 1982. ITT trial expected to begin in December, jury selection completed in November. Attorneys for plaintiff: *Marc Moller* and *Matthew Shafner*. Attorney for defendant, ITT: *John FitzGerald*. See *MWN*, November 1982. [*Engell v. ITT*, US District Court for Connecticut, Hartford, CT, No. H77-130.]

• Robert Barbee filed suit against Bendix, General Electric, Raytheon, RCA, Reeves Instrument, Western Electric and Zenith Radio in Mississippi in October 1982. Claim: radiation exposure while serving as a radar technician in the armed forces from 1942 to 1951 caused cataracts. Status: waiting for pleadings from defendants. Case previously filed in 1979 in Nevada and dismissed in the Ninth Circuit Court of Appeals because of statute of limitations in Nevada. Attorney for plaintiff: *James Cothren*. Previous attorney for plaintiff: *Brent Leavitt*. [*Barbee v. Bendix et al.*, Circuit Court for the First Judicial District of Hinds County, Jackson, MS. Initially filed in US District Court for Nevada, Las Vegas, NV, No. CV-LV-79238.]

• Joseph Coatney filed a claim with the Veterans Administration (VA) in 1981 and filed suit against General Dynamics, Hughes Aircraft and Westinghouse in 1982. Claim: radiation exposure from on-board radar while serving in navy for six years caused cataracts. Status: Claim for VA benefits still pending. Suit against radar manufacturers pending. Attorney for plaintiff: *John Sweeney*. [Administrative agency: VA. Court: State Superior Court, Los Angeles, CA.]

• Frederick Becker filed a claim with the VA several years ago and is in the process of filing suit against radar manufacturers. Claim: radiation exposure from radar on aircraft he serviced while in armed forces caused cataracts and other injuries. Attorney for plaintiff: *John Sweeney*.

- William Farnham filed suit against Hughes Aircraft, Northrop Aviation and Rockwell International in October 1978. Claim: radiation exposure in air force aircraft from 1951 to 1973 caused cataracts. Status: pre-trial. Defendants' offer to settle not accepted, though out of court settlement still possible. Attorney for plaintiff: *Seymour Ellison*. [*Farnham v. Northrop Aviation et al.*, State Superior Court, San Francisco, CA, No. 744782.]

- Glenn Lough filed suit against ITT, Raytheon, Sperry Rand and Western Electric in 1978. Claim: radiation exposure in 1955 and 1956 while in the armed forces caused cataracts. Status: pre-trial. Attorney for plaintiff: *Seymour Ellison*. [*Lough v. Raytheon et al.*, State Superior Court, San Francisco, CA, No. 744781.]

- Don Turner filed suit against Hughes Aircraft, Lockheed, McDonnell Douglas Aircraft and Northrop Aviation in May 1978. Claim: radiation exposure aboard US aircraft from 1954 to 1967 caused cataracts. Status: pre-trial. Defendants' offer to settle not accepted, though out of court settlement still possible. Attorney for plaintiff: *Seymour Ellison*. [*Turner v. Lockheed et al.*, State Superior Court, Los Angeles, CA (moved from State Superior Court, San Francisco, 738065).]

- Stanley Burgis filed suit against Western Electric in 1980. Claim: radiation exposure from M-33 radar he worked on for nine months between 1952 and 1954 while in the army caused cataracts and retina damage. Status: pre-trial. Attorney for plaintiff: *Jeffrey Stoppord*. [*Burgis v. Western Electric*, US District Court for Eastern Pennsylvania, Philadelphia, PA (moved from Pennsylvania state court soon after initial filing).]

- Attorney *Richard Leonard* is preparing a case for a former B-47 aircraft crew member. His client alleges one hour of close-range exposure to an electronic countermeasures device mounted under a plane caused severe injuries. Exposure occurred in the 1960s. Leonard seeking medical experts to support the claim, which is not yet filed.

Concluded:

- Joseph Kerch settled his suit against Air America in spring 1982. Claim: radiation exposure from on-board radar and navigational equipment while working as a pilot caused cataracts. Prior to Air America, Kerch served in the air force for 20 years. This workers' compensation case filed in December 1980 under the Defense Bases Act. Status: settled out of court for \$30,000. Attorney for plaintiff: *Matthew Shafner*. [*Kerch v. Air America*, Department of Labor, Office of Administrative Law Judges, No. 15-19092 80-LHCA-1388 and No. 15-16930 80-LHCA.]

- Leo Foley settled his suit against General Electric, Hazeltine, Hughes Aircraft, Lockheed Aircraft, Philco-Ford, Raytheon and Telerad-Lionel in 1981. Claim: radiation exposure while serving on EC-121 constellation aircraft between 1957 and 1975 caused cataracts. Case filed April 1979. Status: settled out of court for \$25,000. Attorney for plaintiff: *Seymour Ellison*. See *MWN*, November 1981. [*Foley v. Lockheed Aircraft et al.*, State Superior Court, Sacramento, CA, No. 280696.]

- Ronald Karras settled his suit against General Electric and Western Electric early in 1981. Claim: exposure to radiation while working on Nike Hercules radars for 14 years resulted in multiple injuries, including bleeding eyes, deafness and systemic hemorrhaging. Status: settled out of court for \$200,000. Attorney for plaintiff: John Phillips of Chicago, IL. See *MWN*, July/August 1981. [*Karras v. General Electric and Western Electric*, Cook County Circuit Court, IL, No. CV-79-L-20237.]

Oven Cases

In Progress:

- Mildred Beadles, Delores Terhaar and Patricia Seelye filed suit against Litton Industries, Litton Microwave Division, and City Electronics in December 1980. Claim: a malfunctioning Model 800 microwave oven in the restaurant where they worked burned two of the women and traumatized all three. Approximately \$5 million sought. Status: pre-trial. Attorneys for plaintiffs: *Riner Deglow*, *Leonard Schroeter* and *Robert Scanlon*. Attorney for defendant: *James Con-*

nelly. [*Beadles et al. v. Litton*, Superior Court, Spokane, WA, No. 80-2-04512-6.]

- Joyce McCarty filed suit against Magic Chef in 1978. Claim: her son's lymphatic cancer and eventual death were caused by radiation leaking from a microwave oven where he worked. Status: pre-trial, on hold while McCarty seeks medical experts to support claim. Attorney for plaintiff: *Wallace Stephens*. [*McCarty v. Magic Chef*, Second Judicial District Court, Washoe County, NV.]

Concluded:

- Delores Delsesto and Lynn Spinella ended their suit against Amana Refrigeration out of court in March 1982. Claim: radiation from a leaking microwave oven in their company lunch room induced cataracts in both women. Approximately \$3 million sought in suit filed February 1979. Status: case dismissed with consent of both parties after one day of trial in March 1982. Both parties refused to give details. Attorney for plaintiffs: *Mark Decof*. See *MWN*, April 1982. [*Delsesto and Spinella v. Amana Refrigeration*, US District Court, Providence, RI, No. 79-0082.]

- Helen Formakis lost her suit against Tappan in November 1981. Claim: counter-top microwave oven malfunctioned and burned her hand. \$1 million sought. Status: jury found for defendant. Attorney for plaintiff: *Cecile Weich*. Attorney for defendant: *Remo Acito*. See *MWN*, December 1981. [*Formakis v. Tappan*, State Supreme Court, Bronx County, New York, NY.]

US Embassy in Moscow

In Progress:

- George Watson filed suit against the US government in January 1981. Claim: genetic changes and injury from radiation exposure while serving as a marine guard at the US embassy in Moscow caused birth defects in his son. Status: charge that microwave radiation played role in causing defects—negligent failure to warn of hazard under Federal Tort Claims Act—dismissed in spring 1982 under the *Feres* doctrine and is now being appealed. Trial on second charge of medical malpractice by navy doctors set for March 1, 1983. Attorneys for plaintiff: *Peter Danelo* and *Charles Peery*. See *MWN*, January/February 1982. [*Watson v. US*, US District Court, Central District of California, Los Angeles, CA, No. CV 80-5737-CHH. Appeal on first charge filed in Ninth Circuit Court of Appeals, San Francisco, CA.]

- Attorney *John Parker Hills* has filed four cases for people exposed to radiation at the US embassy in Moscow. Two claims filed several years ago with the Department of Labor Employment Standards Administration, Office of Workers' Compensation Programs, were denied by a special claims examiner on July 19, 1982. One of these, filed by the spouse of an embassy employee who died of brain cancer, is being appealed to the Employees' Compensation Appeal Board. Hills also filed an individual and a class action suit for a woman who worked at the embassy and now has cancer. This case, filed with the State Department, is pending. See *MWN*, January 1981.

- Barton Reppert filed suit against the Central Intelligence Agency in July 1981. Claim: seeking documents under the Freedom of Information Act relating to the bioeffects of microwave radiation and to the Soviet microwave irradiation of the US embassy in Moscow. Status: pre-trial. Attorney for plaintiff: *J. Stuart Lemle*. See *MWN*, September 1981. [*Reppert v. CIA*, US District Court, Washington, DC.]

Other Work-Related Claims

In Progress:

- Attorney *Robert Young* added a ninth flight controller claim to the eight reported in last year's survey. Claim: radiation from communications, navigation and radar equipment near control towers and possibly cathode ray tube (CRT) displays in the work place caused cataracts. Status: all nine cases pending. [Administrative agency: Department of Labor Office of Workers' Compensation Programs, Branch of Special Claims.]

- Antoinette Yannon is appealing the July 1982 dismissal of her product liability suit against RCA. Claim: husband's illness and eventual death caused by long-term exposure to microwave radiation while

working on TV relay equipment for New York Telephone. Seeking \$3.5 million from equipment manufacturer for breach of warranty and negligence in suit filed in May 1976. Status: case dismissed on pre-trial motion in July 1982. Appeal filed this fall. Attorneys for plaintiff: *Jerome Ellis* and *David Pauly*. See *MWN*, April 1981, July/August and November 1982. [*Yannon v. RCA*, State Supreme Court for Richmond County, Staten Island, NY, No. 1009-1976. Appeal filed in State Supreme Court Appellate Division, Second Department, Brooklyn, NY.]

- Frederick Nepa filed a workers' compensation claim against the Port Authority of NY and NJ in February 1979. Claim: radiation from a walkie-talkie he used as a PA policeman caused cataracts. Status: pending. Attorney for plaintiff: *Angelo Gucciardo*. [*Nepa v. Port Authority*, Administrative agency: New York State Workers' Compensation Board, New York, NY.]

- Attorney *Angelo Gucciardo* is handling a workers' compensation claim filed this year for a Long Island, NY, police officer. Claim: radiation from a walkie-talkie caused a cataract. Status: waiting for hearing date. [Administrative agency: New York State Workers' Compensation Board, New York, NY.]

Concluded:

- Antoinette Yannon's workers' compensation award for the death

of her husband has been upheld in appeals made by New York Telephone. Claim: husband's illness and eventual death caused by long-term exposure to microwave radiation while working on TV relay equipment for New York Telephone. Status: awarded benefits by New York Workers' Compensation Law Judge in 1980. Decision upheld by Workers' Compensation Board on February 26, 1981 and in appeal to a state court on May 6, 1982. Award of \$45 per week and \$29,000 in retroactive benefits. Attorney for plaintiff: *Angelo Gucciardo*. Attorney for defendant: *Saul Schier*. See *MWN*, April 1981, June and November 1982. [*Yannon v. New York Telephone*, Administrative agency: New York State Workers' Compensation Board, New York, NY, No. 0714-2308 and No. 0752-3602. Appeal filed May 1982 in New York State Supreme Court Appellate Division, Third Department, NY, No. 41045.]

- Sybil Barker and Industrial Indemnity, the workers' compensation carrier for her employer in San Francisco, reached a private settlement for her 1982 partial-disability claim. Claim: visual demands of VDT work caused debilitating eye problem (diagnosed as accommodative spasm). Status: \$7,500 settlement reached in October-November 1982 without compensation board ruling. Attorney for plaintiff: *Kathryn Ringgold*. [Administrative agency: State Workers' Compensation Board, San Francisco, CA.] ☉

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HIGHLIGHTS

Broadcasters Balk at Proposed Massachusetts Standard

At a public hearing convened by the Massachusetts Department of Public Health in Boston on November 29, representatives from the broadcasting industry complained that the state's draft regulations on non-ionizing radiation are too strict. Neil Smith, a consulting engineer testifying on behalf of RKO General, accused the department of trying to satisfy "irrational" public fears by setting an "unnecessarily stringent standard."

Massachusetts became the first state to propose general population health standards for radiofrequency and microwave (RF/MW) radiation last February. (See *MWN*, March 1982.) The Massachusetts proposal is in fact identical to the recently approved American National Standards Institute (ANSI) standard except that it is five times stricter over the entire frequency range between 300 kHz and 100 GHz. The standard is most strict in the 30-300 MHz band, where it specifies a maximum exposure of 200 $\mu\text{W}/\text{cm}^2$. Although the February draft required the registration of all major stationary RF/MW sources and prescribed limits for occupational exposures, the revised draft, the subject of the hearing, limits registration to new sources and drops the occupational standard altogether. (A number of different types of sources are exempt from the rules.)

Jules Cohen, a consulting engineer based in Washington, DC, speaking on behalf of the National Association of Broadcasters, said that if Massachusetts could not wait for a standard to be set by the federal Environmental Protection Agency, "the new ANSI criteria should form the basis for the [standard]—not ANSI divided by five." Douglas Rowe, an attorney in Marlborough, MA, representing the Massachusetts Broadcasters Association, agreed saying the ANSI standard is "more than sufficient."

Others have endorsed the new standard however. In a November 22 letter to the Department of Public Health, Professor A.W. Guy wrote that the proposal is "an excellent compromise that should satisfy the concerns of the public about long-term exposure to non-ionizing radiation without unnecessarily being too restrictive to the users of the radio spectrum." Guy was the chairman of the subcommittee that drafted the ANSI standard. Raytheon's John Osepchuk told *Microwave News* at the hearing that the state did an "eminently reasonable" job, which only needs a little refinement. Osepchuk is a member of the *ad hoc* committee that advised the state on developing the standard over the last two years.

The hearing was relatively brief as most of the 35 attendees preferred to listen rather than testify. Participation was livelier at an informal question-and-answer period that followed the hearing. After repeated complaints about the stringency of the standard, Robert Watkins, a radiation scientist at the department, gave three reasons for the decision to add a safety factor to the ANSI standard, which he called an occupational standard despite ANSI's claims to the contrary: (1) the classic distinction between the general public and workers with respect to age, health and length of exposure; (2) the recommendation of international organizations, especially the World Health Organization, for dual standards; and (3) the language in the ANSI standard that, "Because of the limitations of the biological effects data base, these guides are offered as upper limits of exposure, particularly for the population at large..." As for the origin of the factor of five, Watkins said "our committee picked it."

Another contentious topic was the problem of assigning responsibility for a given level of radiation when there are multiple sources. The only way to deal with it, according to Robert Hallisey, was on a case-by-case basis. Hallisey is the director of the department's radiation control program; he chaired the meeting.

Hallisey said the rules could be promulgated within 90 days of the close of the comment period on December 13. He said that unless "substantial" changes are made after public comments are reviewed, there will be no further hearings. He also noted that the Massachusetts Department of Labor and Industry was developing an occupational standard.

Also testifying were Dr. Don Justesen of the VA Medical Center in Kansas City, MO, on behalf of RKO General and Dr. Russell Carpenter, who retired from the Bureau of Radiological Health in September. Carpenter said that the major problem with RF/MW radiation was the "illusion of risk." He called the level of public ignorance "appalling."

A second hearing on the proposed rules was held in Holyoke, MA, on December 2. According to Watkins, some 25-30 people attended the meeting. He said that they raised similar complaints as those who spoke at the Boston meeting. Ron Peterson of Bell Labs and a representative from Northeast Utilities were among those testifying. ●

Leukemia and Electromagnetic Fields: New Evidence and a Dissenting Opinion

Researchers at the University of Southern California (USC) School of Medicine have uncovered new support for the hypothesis that there is a link between leukemia and exposures to electrical and magnetic fields. Three members of the school's Department of Family and Preventive Medicine have found that white males in Los Angeles County whose jobs required contact with electromagnetic fields had a greater risk of developing leukemia, especially acute myelogenous leukemia (AML).

In a letter published in the November 20 *Lancet*, Drs. William Wright, John Peters and Thomas Mack write that their data are consistent with those of Dr. Samuel Milham who reported a similar link among workers in Washington state last July (see *MWN*, July/August 1982). The USC team identified power linemen as one class of workers who are at increased risk of developing both acute leukemia and AML; telephone linemen had a significantly higher chance of getting AML.

Speaking from his office at the Division of Occupational Health, Dr. Wright told *Microwave News* that he had read Milham's letter when it was published and thought that it would be interesting to apply the same methods to data collected by Mack's Cancer Surveillance Program for Los Angeles. He said he would like to continue this line of research and is looking for a suitable cohort population.

Although the USC researchers warn that the sample size is small and that the workers could have been exposed to other carcinogenic agents, they conclude that the connection between leukemia and non-ionizing radiation deserves further study.

Meanwhile, Dr. Robert Liburdy of the New York University Medical Center takes issue with Milham's paper in a letter to the *New England Journal of Medicine* (November 25). Citing work from the National Institute for Occupational Safety and Health (NIOSH) and the World Health Organization (WHO) and the epidemiological study of employees at the US embassy

in Moscow, Liburdy judges that the "mechanism of interaction of electrical and magnetic fields with biologic materials, although not well understood, differs importantly from the etiology of cancer, which is also not well understood. Negative results do not conclusively rule out a health risk; the data, however, argue against an association." ❁

Busy Times for ANSI C63

Members of the American National Standards Institute (ANSI) Committee on Radio-Electrical Coordination (C63) have been very active revising existing standards and initiating new ones. At meetings held November 3-4 in Washington, DC, they made substantial progress on a number of fronts related to electromagnetic compatibility (EMC), especially with respect to instrumentation and the measurement and control of radiation emissions.

The C63 Committee is in the process of revising two of its standards and has completed work on its one draft standard: ANSI C63.2-1980, *Specifications for Electromagnetic Noise and Field Strength Instrumentation, 10 kHz to 1 GHz*; ANSI C63.4-1981, *Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 10 kHz to 1 GHz*; and ANSI C63.12 (draft), *Recommended Practice on Procedures for Control of System Electromagnetic Compatibility*.

Outlined below are reports of various subcommittee 1 (Techniques and Development) activities, most of which were presented at its November 3 meeting:

- A draft addition to ANSI C63.4 on "Open Area Test Sites," has been forwarded to the full committee for a vote. According to subcommittee chairman Edwin Bronaugh of Electro-Metrics in Amsterdam, NY, most members approved the draft. Representatives of the Federal Communications Commission (FCC) were concerned over the use of broadband antennas to be specified in the new standard. The commission staff prefers making measurements with tuned dipole antennas and is seeking more data before a vote is taken by the full committee next February. The FCC members abstained in the subcommittee balloting.

- The proposed revisions to C63.2 and C63.4 to extend their frequency range down to 20 Hz and up to 18 GHz are nearing completion. A task force chaired by Marge Stone of

AEL Industries in Farmingdale, NJ, has finished working on the lower frequencies for both standards. William Lambdin of Electro-Metrics has nearly completed the revisions to C63.2 for higher frequencies. Only the revision extending C63.4 to 18 GHz, coordinated by James Klouda of Elite Electronics Engineering in Downers Grove, IL, will not be ready for balloting until next summer.

- Don Heirman of Bell Labs in Holmdel, NJ, has developed a first draft for an addition to C63.4 on "Immunity Measurements of Electronic Products." Heirman expects to have a second draft by February and a version ready for a subcommittee vote by June.

- Preparation of a national EMC standard is underway under the direction of Herb Mertel of EMACO in San Diego, CA. The document will compile all EMC standards in the US, either by inclusion or by reference.

- A draft standard for measurement of radiated emissions from and susceptibility of medical devices is being circulated for comment among subcommittee members. The work of the task force, chaired by Al Smith of IBM in Poughkeepsie, NY, has been partially stalled by the loss of several members. A decision on how to proceed will be made at the next subcommittee meeting.

At the full C63 committee meeting on November 4, following the subcommittee session, a decision was made to accept the draft C63.12 EMC standard as final without modification. At the next meeting a new task force chairman will be appointed by members of subcommittee 1 to begin working on refinements to this standard.

The C63 meeting also featured reviews of on-going revisions of the International Electrotechnical Vocabulary and efforts towards international standardization. And Professor Ralph Showers, chairman of the C63 committee, reported on the International Special Committee on Radio Interference (CISPR) meeting held in Stockholm in September. (Showers, who is with the Department of Electrical Engineering at the University of Pennsylvania in Philadelphia, is also the president of CISPR.) *Microwave News* will run an update of CISPR activities in a future issue.

Bronaugh has tentatively scheduled a meeting of subcommittee 1 for next February. A date for the next C63 committee meeting has not been set. ❁

UPDATES

Biological Effects ... *Radio Science*, the journal of the American Geophysical Union, has published the proceedings of URSI's *Symposium on Biological Effects of Electromagnetic Radiation*, held in Helsinki in 1978, as a supplement to its September-October 1982 issue (Volume 17, Number 5S). Among the papers is the study of the effects of prenatal and postnatal exposure to 2450 MHz radiation on squirrel monkeys, which caused quite a stir when it first appeared at a poster session four years ago. At that time, Dr. Joel Kaplan and co-workers reported that, while most of the monkeys suffered no ill effects, there was a high mortality rate among those animals exposed to an average SAR of 3.4 W/Kg before and after birth. EPA, the sponsor of the original study, agreed to supply more money for a replication study to see whether this new effect was more than a statistical anomaly—a possibility given the small sample size and the fewer than expected deaths among the controls. The results of that second experiment, reported in a *note added in proof* to the original paper, "did not support those obtained in the initial experiment. No differences were found between irradiated and control monkeys in the number of abortions, stillbirths or livebirths that occurred or in the number of offspring that died." In a telephone interview from his office at SRI International, Kaplan said that he believed the matter was now settled. At EPA, Dr. Joe Elder, the acting director of the division that

supported the SRI work said, "The suggestions that were raised by the first study have now been satisfactorily answered." This view was echoed by Dr. Michael Gage, who is a co-author of the paper and one of Elder's colleagues at EPA. Though Gage agreed that the question of lethality is now settled, he still favors more work on behavioral teratology, a research area he describes as "not very well explored." Among the 24 other papers in the collection are: "Measurements of Electric and Magnetic Stray Fields Produced by Various Electrodes of 27 MHz Diathermy Equipment" by a team from Finland; "Coherent Oscillations in Biological Systems: Interaction with Extremely Low Frequency Fields" by F. Kaiser of the Institute of Theoretical Physics at the University of Stuttgart; "ELF Magnetic Fields in Electrosteel and Welding Industries" by a group from Linköping University in Sweden; and "Population Exposure to VHF and UHF Broadcast Radiation in the [US]" by R. Tell and E. Mantipl of EPA ... In another teratology study, a group from Thomas Jefferson University in Philadelphia, PA, reports on the effects of prenatal exposure of rats to 10 mW/cm² of 915 MHz for six hours a day throughout gestation in the October issue of *Radiation Research*. They found "no significant teratogenic activity" at this exposure level—a level which did not induce a "significant" increase in the rat's body temperature (average SAR = 3.57 W/Kg).... And a team from EPA has

found that the exposure of pregnant rats to 425 MHz continuous wave radiation ($SAR = 3.1-6.7$ W/Kg) "may lead to increased mitogen-stimulated responses by lymphocytes." Writing in the September issue of the *Journal of Microwave Power*, the authors state that they do not know what mechanism is responsible for the observed changes, though it does not appear to be frequency dependent: "Whether these changes in lymphocyte response reflect an alteration in the functional integrity of the exposed animal's immune system remains to be investigated." ... Dr. Gregory Lotz of the Naval Aerospace Medical Research Laboratory in Pensacola, FL, has issued a technical report, *Hyperthermia in Rhesus Monkeys Exposed to a Frequency (225 MHz) near Whole-Body Resonance*, describing the work that prompted great interest when he first presented it at the 1981 BEMS conference (see *MWN*, September 1981). At power levels in excess of 5 mW/cm² ($SAR = 2.3$ W/Kg), Lotz observed "severe hyperthermia" and concludes that "the effects on rhesus monkeys of exposure to a resonant frequency (225 MHz) were substantially greater than what could be predicted based upon straightforward comparisons of dosimetric information (SAR) and the effects of exposures to a much higher frequency (1290 MHz)." ... Do non-thermal effects of RF/MW radiation exist? Professors Herman Schwan and Sol Michaelson, neither one a stranger to this continuing debate, offer opposite views in recently published papers. In a presentation at last year's 10th *L.H. Gray Conference* (see Medical Applications Update), Schwan describes "observed non-thermal effects of alternating fields" and states that he believes that "ponderomotive" forces are responsible—these are caused by electrical fields acting on non-polar particles. Among the non-thermal effects listed by Schwan are: pearl chain formation, movement in inhomogeneous fields and changes in the shape of cells as well as their destruction and fusion. Michaelson takes an opposite view in an unfavorable review of the World Health Organization's (WHO) criteria document on RF/MW radiation (see *MWN*, March 1982). In the October issue of *Radiation Research*, Michaelson writes: WHO's "unqualified acceptance of postulated non-thermal bioeffects with resonant frequency dependence and 'windows' is not justified by the evidence. There are many scientists who hold a working hypothesis that all RF/MW bioeffects are explainable as the result of internal heating (albeit non-uniform throughout the organism). Much of the literature on 'non-thermal' effects is marred by artifacts, conceptual problems or misinterpretation of data. It is regrettable the author(s) of the present document neglected to fully explore and take such factors into cognizance." Overall, he finds the document "distressing" because it "does not come up to the high scientific caliber and accuracy of the usual WHO publications." ... Another paper presented at the Gray Conference argues for the presence of non-thermal effects of microwaves. A group of German researchers report on experiments in which they monitored the growth rate of yeast exposed to radiation in the frequency range 41.640-41.835 GHz. Previous work had indicated the occurrence of "very remarkable effects": the growth rate increased and decreased at certain specific frequencies and there were a number of resonances, each with a line-width of about 10 MHz. The new work provided confirmation. They conclude, "There are changes in yeast growth rate, caused by low intensity microwave irradiation. These effects depend on frequency, showing a strong resonant-like behavior, and are not correlated to the microwave power used. These effects are not explainable in terms of simple thermal response." ... Commenting on the paper connecting fluorescent light with skin cancer (see *MWN*, September 1982), Allan Jensen of the Danish National Institute of Occupational Health proposes that polychlorinated biphenyls (PCBs) may be the more likely toxic agent. PCBs can be emitted by fluorescent light fixtures, especially after the burnout of a ballast. His letter appears in the October 23 issue of *Lancet*. ... The *IEEE Transactions on Microwave Theory and Techniques* will publish a special issue on "Electromagnetic Wave Interactions with Biological Systems" in July 1984. Georgia Institute of Technology's James Toler is the guest editor of the collection. Papers are due by October 12, 1983.

Communications. ... The New Jersey Department of Health will investigate a possible link between microwaves and birth defects and cancer in Vernon, NJ. Responding to local fears stirred up in a siting battle over a proposed RCA Americom relay tower, the Sussex Coun-

ty Health Department contacted the state's Epidemiology and Disease Control Division late last month. (There are already a number of RF/MW sources in Vernon. See *MWN*, November 1982.) A health department spokeswoman said the Sussex request is routine except for the possible link with microwaves: the department gets "a number of cancer clusters reports" every month. Charles Lawson, an epidemiologist with the department's Parental and Child Health Services, said the analysis would probably include a review of local hospital records for 1979-1981 and whatever other information the county board could provide. According to Lawson, this type of analysis usually takes over six months to complete. Meanwhile, Americom is scheduled to host a public meeting to discuss its proposed tower on December 11. ... NTIA plans for developing long-range international telecommunications policies appear in the November 2 *Federal Register* (47 FR 49694).

Compatibility & Interference. ... Competition between land mobile services and UHF-TV stations for spectrum space continues and promises to get worse: often, the result is unacceptable interference. A classic example is WVEU, Channel 69 in Atlanta, GA. The station, operating at 800-806 MHz from the roof of the Peachtree Plaza Hotel, has been forced to broadcast at an ERP of 2.63 kW, 30 dB or a thousand times below its authorized level, because of out-of-band interference with land mobile (806-807 MHz) repeaters located on the same roof. As the "newcomer" WVEU has the responsibility for correcting the RFI problem. Last April, the station asked the FCC for permission to operate at 50 percent power but the petition was denied on September 29. The station has now filed a petition for reconsideration. Also in November, the commission proposed rules to allow the operation of public land mobile units on UHF Channel 14 in Pittsburgh, PA (see 47 *Federal Register* 53752, November 29). According to Ralph Justus of the FCC's Broadcast Bureau, "Unless the spectrum is managed to afford protection between these services, the interference problem is going to recur many times over the next 20 years." He cites UHF stations in Tyler, TX, Boulder, CO, San Diego, CA, and Washington, DC as other potential trouble spots. The commission's Private Radio Bureau has released an interim report, *Future Private Land Mobile Telecommunications Requirements*. ... With respect to satellite communications, the FCC has issued an alert on the need to consider the potential for RFI in designing and manufacturing direct broadcast satellite home receivers. Specifically, the commission noted that, based on theoretical considerations, out-of-band emissions from terrestrial systems could fall into the 12 GHz band, as could harmonics from ISM equipment — especially microwave ovens—and very high-power radars. ... On September 10, the American Satellite Co. of Rockville, MD, filed a petition asking the FCC to adopt standards that would protect against RFI from the improper operation of transmitting earth stations. One commission staffer told *Microwave News* that the FCC has not received a large number of complaints with respect to RFI from satcom stations and that "there are differences in opinion on how serious this problem is." ... The October 11 issue of *Broadcasting* features a summary of comments submitted on the FCC's proposed rule for resolving FM blanketing interference (see *MWN*, May 1982). ... And the FCC has found that, while cordless telephones do not comply with its rules on radiated signals, they do not constitute a serious problem: it has received few RFI complaints from amateur radio operators in the 1.8-2.0 MHz band. The FCC plans to propose new rules for cordless telephones in 1983. ... State policemen have begun noticing that signals from their walkie talkies can interfere with their Breathalyzer units, used to test the sobriety of drivers. A spokesman for Smith & Wesson, the manufacturer of the units in Springfield, MA, admits such RFI, though rare, can occur. ... George Washington University's Continuing Engineering Education program is sponsoring a course on *Electromagnetic Interference and Control* in Washington, DC, January 10-14. For more information, call (800) 424-9773.

Government. ... For a brief moment in early October there were rumors that EPA management had officially approved long stated plans to set safety levels for public exposure to RF/MW radiation. Work on the guidance has been going on for some time: EPA's Office of Research and Development in Research Triangle Park, NC, is in

the final stages of preparing a criteria document on the effects of non-ionizing radiation—due for release early next year—which will serve as the basis for the guidance. And a group at the Environmental Sciences Division of DOE's Lawrence Livermore Laboratory in Livermore, CA, is studying the economic impact of the guidance (see *MWN*, December 1981). EPA Assistant Administrator Kathleen Bennett did approve the advanced notice of proposed rule making (ANPRM), but Administrator Anne Gorsuch has yet to sign it. As we go to press at the end of November, there is still no sign as to when the ANPRM will appear in the *Federal Register*. . . . The National Center for Devices and Radiological Health (which absorbed BRH) is reviewing its reporting and record-keeping requirements for radiation emitting products as required under the Radiation Control for Health and Safety Act of 1968. According to present rules, manufacturers must submit data on the operation, labeling and design of electronic devices as well as incidents of accidental radiation exposure. In addition they must maintain records on quality control procedures, test results and methods for controlling radiation emissions. Among those devices using non-ionizing radiation that fall under these regulations are: microwave heating equipment, RF heaters and sealers and diathermy machines. A task force at the center is assessing whether or not the regulations are still needed and is soliciting public comment. As the center's John Bailey put it: "We are looking to see if there is a better or alternative way of satisfying the act." For more information see the notice in the November 16 *Federal Register* (47 FR 51706) or call Bailey, (301) 443-3434. Comments are due by February 14, 1983; Bailey hopes to have recommendations ready by next September. . . . The Consumer Product Safety Commission (CPSC) has proposed rules to decide when to release complaints on specific products. The proposal, published in the November 5 *Federal Register* (47 FR 50283), would make it easier for CPSC to disclose information to the public. . . . NIOSH's Division of Biomedical and Behavioral Science in Cincinnati, OH, is looking for a chief for its Physical Agents Effects Branch to replace Dr. Wordie Parr who is retiring at the end of the year. A candidate must be an engineer or a physicist and be able to direct a research program on the health and safety impact of occupational exposures to radiation, noise, vibration as well as high and low temperatures and pressures. The salary range is \$41,000-\$48,500. For more information contact: Jon Ruse, Personnel Office, NIOSH, 4676 Columbia Parkway, Cincinnati, OH 45226.

Measurement. . . A team from Italy's National Research Council in Florence has developed an RF hazard monitor to protect workers against overexposure to RF heater and sealer radiation. The patented instrument has a flat frequency response in the 2-100 MHz range, with an overall accuracy of ± 2.5 dB with a typical value of ± 0.7 dB. The monitor incorporates applicable safety standards: red and yellow indicator lights turn on in the presence of "excessive" power levels. In the description of the monitor, presented in the September issue of the *Journal of Microwave Power*, the team advises that it could also be used in a number of other applications, including exposures to AM and FM broadcast radiation, short-wave diathermy and military communications. . . . The publication of NBS' draft handbook for its Electromagnetic Calibration Services Voluntary Laboratory Accreditation Program, due out this month, has been held up as the bureau resolves a number of tricky technical questions. According to NBS' John Locke, the draft handbook should be available early next year. . . . In a paper to appear in a forthcoming issue of *IEEE Transactions on Instrumentation and Measurement*, David Wait of NBS' Boulder laboratories reviews NBS' noise measurement program for antenna systems with gains between 51 and 65 dB in the 1-10 GHz frequency range. For large antennas, 11-28 meters in diameter, radio stars are used as the known noise source. For smaller antenna systems, 4-5.5 meters in diameter, the moon is the preferred source. . . . Among the papers to be presented at the *National Radio Science Meeting* in Boulder during the first week in January are "Preliminary Results from Measurements of 800 MHz Radio Transmission into Residential Buildings" by a team from Bell Labs in Holmdel, NJ, and "Measurements of the Microwave Dielectric and Attenuation Properties of Plants" by two researchers from the Remote Sensing Lab at the University of Kansas in Lawrence. For details see Conference Calendar on p. 10.

Medical Applications. . . The National Center for Devices and Radiological Health's Radiological Devices Panel is set to meet on December 8 and 9 in Rockville, MD. On the agenda are a review of the current status of NMR imaging devices and a premarket approval application for a RF/MW hyperthermia machine. The identity of the manufacturer seeking approval is confidential until the meeting. Dr. R.D. Saunders of the NRPB in the UK was scheduled to review the British experience with NMR, but will not be able to attend. At the request of the National Electrical Manufacturers Association (NEMA), there will be a discussion of the reorganization of the BRH and the Bureau of Medical Devices. What concerns NEMA, according to one of its staff, is that BHR's past authority should not get diluted by the change. For more information contact: Dr. Robert Phillips, (301) 443-3426. . . . The North American Hyperthermia Group (NAHG) will hold its third annual meeting during the Radiation Research Society's conference February 27-March 7 in San Antonio, TX. For more information contact: Dr. Dennis Leeper, 925 Chestnut Street, Philadelphia, PA 19107. The abstracts of the papers from this year's NAHG meeting, held in Salt Lake City, UT, April 17-19 are published in the August issue of *Radiation Research*. . . . The Proceedings of the 10th *L.H. Gray Conference: Ultrasound, Microwave and Radiofrequency Radiations: the Basis for Their Potential in Cancer Therapy*, held in Oxford in July 1981, are published in a supplement to the March 1982 issue of the *British Journal of Cancer*. Among the large number of papers is one from Poland that compares the effects of whole-body and local microwave hyperthermia on the immune system. Drs. M. Janiak and S. Szmigielski of the Center for Radiobiology and Radioprotection in Warsaw report that local heating is preferable to whole-body hyperthermia because the former does not inhibit the immune response. . . . Fonar announced a breakthrough at the Radiological Society of North America meeting in Chicago at the end of November: a new 3,000-gauss permanent magnet for use in whole-body NMR imagers. A spokesman for Fonar said the magnet has a very small fringe field and is therefore much easier for hospitals to house. He added that Fonar hopes to get FDA approval for its NMR units in the first half of 1983. The news sent the price of Fonar stock to new highs. . . . The program for the first annual *Meeting of the Society for Magnetic Resonance Imaging* to be held in Colorado Springs in February is now available. See Conference Calendar on p. 10 for details.

Military Systems. . . Wisconsin Governor-Elect Anthony Earl has confirmed his campaign commitment to oppose Project ELF, the navy's land-to-submarine communication system. In a post-election statement, he called it "primarily an offensive system which would not help to move us along the road to arms control and arms reduction," and announced plans to contact Michigan's Governor-Elect James Blanchard to work together against the project. On another front, the Wisconsin Natural Resources Board passed a resolution affirming its opposition to Project ELF on November 17. . . . The Department of Transportation has approved the construction of the H-3 highway project, part of which will be under the coast guard's Omega antenna (see *MWN*, July/August 1982). Construction could begin in January. . . . The navy is building an AEGIS Combat System Center on Wallops Island, VA. In a November 1 notice in the *Federal Register* (47 FR 49437), the navy announced that it would not prepare an environmental impact statement for the project but that an environmental assessment had been completed. The navy notes that, "The radars utilized do constitute a hazard zone extending some 2,000 feet seaward; however, the beam is elevated to keep radiation levels at the shoreline within the standard of 10 mW/cm² for continuous exposure. Continuous monitoring and built-in system checks will automatically turn off the equipment if radiation levels are excessive so that there is no perceived hazard to operating personnel, shoreside or surface inhabitants."

Mobile Communications. . . Allocating cellular mobile phone markets is proving to be a tough job. The second FCC cellular construction permit went to AT&T's Boston subsidiary last month. But at about the same time, the Justice Department asked the FCC to delay issuing permits to phone companies until the commission clears up

questions over its licensing procedures, which some applicants argue are anti-competitive. And the commission must now wade through almost 400 applications received for the 30 second-largest cellular markets.

Ovens. . . It looks as if a large number of people are planning to put a microwave oven under their Christmas trees, or at least that is what retailers are betting on. Factory shipments of ovens exceeded 470,000 in October, the largest number for any month in history. A spokeswoman for the Association of Home Appliance Manufacturers, which compiles these statistics, noted that microwave ovens are popular gift items in the current economic climate because they meet the needs of working women. Even with a record-breaking October, microwave oven shipments for the year are still down 11.2 percent over the first ten months of 1981. . . . A one-month-old baby girl was hospitalized with third degree burns on the left hand, right foot and abdomen in Caledonia, MI, on October 31. State police Detective Sgt. Robert Golm suggested that the burns were caused by the microwave oven in the home of the baby's parents; the police have impounded it. Golm told *Microwave News* that there were no defects in the oven and that it would not operate with the door open. "We do not feel it was an accident," he said. The case is now being handled by Barry County Prosecutor Judy Hughes. Repeated attempts to reach Hughes were unsuccessful. . . . A November 29 pre-trial conference on the FTC's complaint against Amana Refrigeration Inc. for deceptive advertising (see *MWN*, November 1982) was rescheduled for December 9. On November 30, the FTC moved for a "summary decision," according to FTC attorney Andy Sachs. If accepted, there would be no trial; a decision would be issued by the administrative law judge hearing the case. . . . Thermador/Waste King Co. has re-issued a booklet, *Microwave Nutrition Report*, first released in 1977, which compares the reduction of Vitamin C (ascorbic acid) in fruits and vegetables cooked in microwave ovens and by other conventional methods: "In 18 out of 24 instances studied, the ascorbic acid content of the microwave cooked product was significantly higher than that observed after the conventional and convenient methods were used." The studies were carried out by Professor Gertrude Armbruster at Cornell University's Division of Nutritional Sciences. Copies are available from the company at 5119 District Blvd., Los Angeles, CA 90040. . . . General Electric has introduced a new line of microwave ovens. Its Dual Wave system cooks food from the top with a rotating antenna and from the bottom with a static wave guide. GE is marketing eight models in the line, with prices ranging from \$300 to \$550. Among their features are "Auto Roast" with automatic temperature control and "Auto Defrost." . . . The International Electrotechnical Commission has published its standard IEC 705-1981, *Methods for Measuring the Performance of Microwave Cooking Appliances for Household and Similar Purposes*. A copy is available for \$14.00 from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

Power Lines. . . DOE held a meeting to review its sponsored research on 60-Hz electric field effects, November 15-18 in Denver, CO. Representatives from seven research groups presented progress reports on 28 different projects. A limited number of copies of the abstracts of the papers are available from Kenneth Klein, Electric Energy Systems Division, CE-143, DOE, Forrestal Building, Mail Stop 5EO52, Washington, DC 20585. No other proceedings of the meeting will be prepared. DOE is still operating on last year's budget under a continuing budget resolution. As a consequence, Klein said in an interview, it is doubtful that any new contracts will be signed this fiscal year: all available money will be devoted to work already in progress. . . . The Minnesota Environmental Quality Board (MEQB) is scheduled to meet on December 16 to review a number of studies on the effects of the Cooperative Power Association-United Power Association DC power line (running from a coal field in North Dakota to Minneapolis-St. Paul) and to consider whether its construction and operation permit requirements adequately protect health and safety. According to a presentation by Professor Frank Martin of the University of Minnesota, Minneapolis, at a November 13 MEQB public meeting, preliminary evidence from a study of dairy cattle indicates no ill effects due to the 400 kV line. The board's ion monitor-

ing program did uncover one surprising result: a relatively high concentration of small ions (5,000/cc) a quarter of a mile downwind from the line. Final reports are scheduled for release in January. For more information contact: MEQB's George Durfee, 15 Capitol Square Building, 550 Cedar Street, St. Paul, MN 55101, (612) 296-2878. . . . Last month we reported on a Swedish study linking power lines with cancer. We have now learned that one of the authors, Professor Bengt Enander of the Royal Institute of Technology in Stockholm died in June 1981; he was only involved in the early stages of the project helping Dr. Lennart Tomenius make magnetic field measurements. Dr. Tomenius was the principal author of the report.

Satellite Communications. . . The Stamford, CT, Citizen Action Group is pressing for satcom station siting rules. A proposed city ordinance that would require current and future station operators to perform environmental impact studies is now before the Health and Protection Committee of the Stamford Board of Representatives—the town council. According to a group spokesman, local concern focuses on Group W Satellite Communications' new Stamford facilities. If the draft ordinance passes a committee vote, which the group expects will happen soon, a public hearing on the rules will be held early next year. . . . Progress toward developing direct broadcast satellite (DBS) services continued last month as seven applicants joined Comsat's Satellite Television Corp. in winning FCC construction permits for DBS systems. . . . As the future grew brighter for domestic DBS last month, the international picture dimmed. According to a November 29 report in *Broadcasting*, a UN special political committee voted to bar direct satellite transmissions across national borders without the receiving country's consent.

VDTs. . . According to Dr. Michael Rosenberg, chief of reproductive health at NIOSH in Cincinnati, negotiations are still underway for a planned reproductive study of VDT operators. As we reported last month, NIOSH is in the process of setting up an epidemiological study, which will include over 5,000 pregnancies, to investigate charges that the sets are associated with miscarriages and birth defects. Rosenberg said that the negotiations should be concluded by the beginning of the new year. . . . NIOSH is also planning a reproductive study of women exposed to PCBs. This work is unrelated to VDTs, but may be of interest to those who believe they are exposed to these chemicals in the office either from fluorescent light fixtures or from VDT capacitors and transformers. (See also *Biological Effects Update*.) NIOSH will investigate 200 women who worked at a New York factory that manufactured transformers between 1940 and 1976. Rosenberg is the project officer for the PCB study. . . . Two ergonomics studies are also getting started. NIOSH has contracted with Dr. Marvin Dainoff of Miami University in Oxford, OH, to evaluate three of its in-house studies on the effects of adjustable furniture and lighting, separately and together, on worker health and productivity. In another project scheduled to begin this January, NIOSH will monitor the vision and blood pressure of 24 professional typists for nine months in an experimental study of VDT workplace design. The institute's Dr. Michael Smith is the project officer for both projects. . . . An Ontario task force investigating VDTs has recommended shielding all flyback transformers and testing all units for X-rays before they leave the manufacturer. The group's draft report, *Possible Health Hazards of Video Display Units*, also calls for a major epidemiological study of potential reproductive hazards, including radiation and PCBs. It advises that when alternative work is not available, pregnant operators should be eligible for workers' compensation, with the employer making up any loss in income. The task force, chaired by Dr. Gordon Stopps of the University of Toronto, presented its draft report to the Ontario Ministry of Labor's Advisory Council on Occupational Health and Safety on November 30. . . . Maria Stuchly and colleagues at the Radiation Protection Bureau of Health and Welfare Canada in Ottawa have a different view of potential VDT hazards. They made measurements of ELF (5-500 Hz) magnetic fields and RF (10-200 kHz) electric fields from VDTs. For the three units tested for ELF, most emissions were at 60 Hz and its harmonics, with higher levels for even harmonics than odd ones. At 30 cm from the front of the screen, magnetic fields were between 0.097 and 0.217 A/m. Only one reading was taken close to the transformer at the back of a unit, the Perkin Elmer Model 550: there

the magnetic field was 4.019 A/m. According to bureau scientists, these radiation levels were in line with other electrical devices; for instance, a hand mixer has been found to have localized fields of 9.295 A/m. They say that ELF magnetic fields around VDTs "are of such low intensities that they are very unlikely to have any biological effects, let alone represent a health hazard." The bureau staff tested 57 models (86 sets) for RF radiation and found emissions in this frequency range were also well below safety limits. At the operator's position, 30 cm from the screen, electric field intensities for 20 models were in the range between 1 and 5 V/m and for 37 models below 1 V/m. Maximum readings were generally found near the flyback transformer, but for three models the maximum reading was found at the screen, with emissions dropping from above 200 V/m to less than 70 V/m at a distance of 10 cm. For 10 other models, maximum readings above 200 V/m, but not specified, were identified on the top, side and back of the units. . . . Plans are still in the works for introducing a VDT safety bill into the Connecticut Legislature. Sñate Senator Michael Skelley is likely to submit a bill to the legislature's Labor and Public Employees Committee early next year (see *MWN*, November 1982) . . . A VDT safety bill introduced in the British Columbia Legislature failed to receive consideration this year. Private members bill No. M210 was introduced by legislator Karen Sanford in October . . . The Australian Council of Trade Unions published its "Guidelines for Working with Screen-Based Equipment" in its *Health and Safety Bulletin* this May. The 44-page report lists cataracts and pregnancy problems among potential VDT hazards. It states that "no satisfactory long-term follow-up study of operators of [VDTs] has been performed, and so statements to the effect that the equipment does not or cannot damage, e.g. eyes or eyesight, are without foundation. In the light of disastrous experiences associated with introduction of new technologies in the past, [union] affiliates should regard screen-based equipment as a likely cause of severe health effects until it is shown to be safe." The guidelines were edited by John Mathews and Nick Calabrese, ACTU/VTHC Occupational Health and Safety Unit, Trades Hall, Box 93, Carlton South, 3053 Victoria, Australia. . . . The Newspaper Guild has warned its locals not to accept VDT radiation tests performed by the Research Institute of the American Newspaper Publishers' Association. Guild President Charles Perlik argues that an impartial third party should perform the tests.

Etc. . . The papers presented at the Ann Arbor meeting on risk analysis and microwaves (see *MWN*, December 1981) have been edited by University of Michigan Professor Nicholas Steneck and have just been published by the San Francisco Press. In one of the conference's more controversial and widely circulated papers, Allan Frey criticizes Professor Bill Guy's experiment on the long-term, low-level effects of 2450 MHz radiation. (The study, funded by the air force, is now nearing completion at the University of Washington, Seattle.) When the paper was first distributed, Guy and his co-workers asked Steneck for the opportunity to respond, and Frey in turn was allowed a brief reply. All of this was to be published in the book, but as Steneck notes, on seeing Frey's second statement, Guy's group withdrew its critique. Steneck published Frey's reply anyway; in it Frey asks, "Why did Guy take on a project which involved the expenditure of approximately \$1.5 million of public funds with the known critical sensitive tests ruled out by the sponsor for a nonsensical reason? Is this science?" *Risk/Benefit Analysis: The Microwave Case* is available for \$15 from the San Francisco Press, Box 6800, San Francisco, CA 94101. . . . In an article published in the summer 1982 issue of *Science, Technology & Human Values*, Steneck argues for involving historians in policy deliberations. He uses the microwave debate as a case study, which "shows how history has been misused, abused and neglected . . ." Steneck is with the Department of History at the University of Michigan. . . . There is a new computer game called *Microwave* on the market. The objective is to direct Teddy the Salvage Man through a maze so that he can repair equipment and computers (thereby collecting points) while avoiding attacks by alien beings. Teddy can outrun the aliens or fight them off with dishes that spew out lethal microwaves. This writer who has little talent for such games nevertheless found *Microwave* quite addictive. The game is designed for an Apple II computer; it is available for \$34.95 from Cavalier Computer Corp, PO Box 2032, Del Mar, CA 92014. ●

CONFERENCE CALENDAR

- January 5-7: *National Radio Science Meeting*, University of Colorado, Boulder, CO. Contact: T.E. VanZandt, NOAA/ERL/R445, 325 Broadway, Boulder, CO 80303.
- February 14-18: *1st Annual Meeting of the Society for Magnetic Resonance Imaging*, Broadmore Hotel, Colorado Springs, CO. Contact: SMRI, Suite 506, 4720 Montgomery Lane, Bethesda, MD 20814.
- February 14-19: *7th International Conference on Infrared and Millimeter Waves*, University of St. Jerome, Marseille, France. Contact: Kenneth Button, National Magnet Lab, MIT, Cambridge, MA 02139.
- February 27-March 3: *31st Annual Meeting of the Radiation Research Society*, Hyatt Regency, San Antonio, TX. Contact: RRS, 925 Chestnut Street, Philadelphia, PA 19107. The *3rd Annual Meeting of the North American Hyperthermia Group* will be held simultaneously, February 27-March 1.
- March 8-10: *Microwave Systems Applications Technology*, Sheraton Washington, Washington, DC. Contact: Richard Hartman, EW Communications, 1170 East Meadow Drive, Palo Alto, CA 94303.
- March 8-10: *5th Electromagnetic Compatibility Symposium and Technical Exhibition*, Zurich, Switzerland. Contact: Dr. T. Dvorak, EMC-83, ETH Zentrum-IKT, 8092 Zurich, Switzerland.
- April 5-8: *International Magnetics Conference*, Franklin Plaza Hotel, Philadelphia, PA. Contact: F.J. Friedlander, School of Electrical Engineering, Purdue University, W. Lafayette, IN 47907.
- April 6-7: *Annual Meeting of the National Council on Radiation Protection and Measurements*, Washington, DC. Contact: NCRP, 7910 Woodmont Avenue, Bethesda, MD 20814.
- April 10-13: *61st Annual Convention of the National Association of Broadcasters*, Las Vegas Convention Center, NV. Contact: NAB, 1771 N Street, NW, Washington, DC 20036.
- April 12-15: *3rd Annual International Conference on Antennas and Propagation*, University of East Anglia, Norwich, UK. Contact: IEE, Savoy Place, London WC2R 0BL, United Kingdom.
- May 2-5: *2nd Annual Test & Measurement World Expo*, Convention Center, San Jose, CA. Contact: Meg Bowen, Conference Director, 215 Brighton Avenue, Boston, MA 02134.
- May 15-19: *15th Annual Meeting of the Conference of Radiation Control Program Directors*, Eldorado Hotel, Reno, NV. Contact: Charles Hardin, CRCPD, 65 Fountain Place, Frankfort, KY 40601.
- May 22-25: *18th Annual Meeting of the Association for the Advancement of Medical Instrumentation*, Loews Anatole, Dallas, TX. Contact: AAMI, Suite 602, 1901 N. Fort Myer Drive, Arlington, VA 22209.
- May 23-26: *International IEEE/APS Symposium and National Radio Science Meeting*, University of Houston, TX. Contact: Professor Liang Shen, Department of Electrical Engineering, University of Houston, TX 77004.
- June 1-3: *IEEE/MTT-S International Microwave Symposium*, Sheraton Boston Hotel, Boston, MA. Contact: Frank Leith, Alpha Industries, 20 Sylvan Road, Woburn, MA 01801.
- June 12-16: *5th Annual Bioelectromagnetics Society Meeting*, University of Colorado, Boulder, CO. Contact: BEMS, 1 Bank Street, Gaithersburg, MD 20878.
- June 21-23: *International Aerospace and Ground Conference on Lightning and Static Electricity*, Fort Worth, TX. Contact: Nick Rasch, FAA Technical Center, ACT-340, Atlantic City Airport, NJ 08405.
- July 18-21: *20th Annual IEEE Conference on Nuclear and Space Radiation Effects*, Sheraton Gatlinburg Hotel, Gatlinburg, TN. Contact: E.F. Hartman, Div. 9336, Sandia National Laboratories, Albuquerque, NM 87185.
- July 18-22: *7th International Symposium on Bioelectrochemistry and Bioenergetics*, Stuttgart, West Germany. Contact: Professor M. Blank, Department of Physiology, Columbia University Medical School, 630 West 168th Street, New York, NY 10032.
- August 23-25: *IEEE International Symposium on Electromagnetic Compatibility*, Hyatt Regency-Crystal City, Arlington, VA. Contact: Aaron Sullivan, Jr., 7121 Wolf Tree Lane, Rockville, MD 20852.
- August 23-26: *URSI International Symposium in Electromagnetic Theory*, Santiago de Compostela, Spain. Contact: Dr. J.L. Sebastian, Dept of Electricidad y Electronica, Facultad de Ciencias Fisicas, Ciudad Universitaria, Madrid (3), Spain.
- October 3-5: *3rd Annual Meeting of the Bioelectrical Repair and Growth Society*, San Francisco, CA. Contact: Dr. Lorraine Day, San Francisco General Hospital, 1001 Potrero, San Francisco, CA 94110.