MICRO WAVE NEWS

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INSIDE...

Microwave News invites contributions to *From the Field*, our occasional column featuring news and opinions from the non-ionizing radiation community. Letters from readers are also welcome.

FCC To Consider RF/MW Radiation Hazards

The Federal Communications Commission (FCC) has decided to require its applicants to consider the health risks associated with human exposures to radiofrequency and microwave (RF/MW) radiation emitted by certain types of communications facilities. At the same time, the commission has begun the process of fine-tuning the new rules by proposing to include and exclude specific classes of communications facilities.

The rules amend existing FCC regulations for compliance with the National Environmental Policy Act of 1969 (NEPA), which requires the preparation of environmental impact statements (EIS) for "major" federal actions. With respect to non-ionizing radiation, the agency will now define a major action as any facility, new or upgraded, which "would expose workers or the general public to levels of RF radiation exceeding health and safety guidelines issued by the American National Standards Institute" (ANSI).

Under the rules, which will take effect on October 1, applicants for construction permits, licenses or renewals as well as those seeking to modify existing facilities, would have to evaluate radiation hazards. If a project qualifies as a major action, with human exposures above the ANSI limits, a narrative statement describing the environmental conditions would have to be submitted to the commission. The FCC would then decide if an EIS is required.

In a series of telephone interviews, knowledgeable sources indicated that the net effect of the new FCC rules would be the enforcement of the

(continued on p.4)

AIBS ELF Study Completed

The American Institute of Biological Sciences (AIBS) has concluded that it is "unlikely" that the extremely low frequency (ELF) electric and magnetic fields associated with the Navy's Project ELF submarine communications system can lead to adverse health effects on the public, animals or plants.

Professor H.B. Graves of Pennsylvania State University in University Park, the chairman of the AIBS panel, told *Microwave News* that the committee was unanimous in reaching its conclusions and recommendations.

The U.S. Navy, which commissioned the study, plans to release it on April 1. In late March, Graves briefed legislators on Capitol Hill in Washington, DC, and state officials in Madison, WI, and Lansing, MI, on the study findings.

The Navy prepared a 38-page appendix to the 290-page AIBS report that details the characteristics of the electromagnetic fields associated with the ELF system.

News of the release of the AIBS study comes as we go to press. We will present a detailed summary of the report in our May issue.

HIGHLIGHTS

IBM Report Recommends Shielding Older VDTs

Dr. Bill Guy of the University of Washington in Seattle advised IBM in a report submitted last October that some older video display terminals (VDTs) emit levels of radiation that might cause biological effects. These terminals should be shielded to block emissions, he recommended.

At the same time, Guy concluded that newer models manufactured to meet federal standards for electromagnetic interference (EMI) reduce these fields to safe levels.

The 66-page report was kept confidential by IBM, but a copy was obtained by *Microwave News*. Last October, IBM released a six-page summary of the report, which did not recommend shielding older VDTs. In a telephone interview, Guy explained that he addressed only newer VDTs in the summary (see *MWN*, September and December 1984).

In the full report, Guy stated that: "The localized [electric] fields at the surface of an unshielded cover of a VDT nearest the flyback transformer can reach extremely high values. Since these fields have a capability of inducing much greater currents in an exposed user of the device than the relatively low magnetic field emissions, it certainly is desirable to shield the cover of the VDT. Since such shielding is relatively inexpensive the benefit to cost ratio is large. Such shielding is generally present in newer models of VDTs to satisfy [Federal Communications Commission] requirements for reducing [EMI]."

The FCC regulations took effect October 1, 1983 and apply to radiated emissions in the 30-1000 MHz frequency range. (They also set limits for conducted interference for 0.45-30 MHz.) The VDT fields studied by Guy were between 15-20 kHz with harmonics to about 1 MHz.

Guy recommended against shielding VDTs to block magnetic fields. Because these emissions are "significantly lower and induce much less current in an exposed subject" than the electric fields, "there is less need to provide magnetic shielding....unless it can be shown that there is a real hazard due to the magnetic field exposure," he explained.

Both documents were prepared for IBM's Office of the Director of Health and Safety. (The "Recommendations" from the full report, *Health Hazards Assessment of Radio Frequency Electromagnetic Fields Emitted by Video Display Terminals*, are reprinted on p.11.)

Tom Mattia, a spokesman for IBM, said that the report supported IBM's practice of shielding its terminals. He told *Microwave News* that all current IBM terminals are shielded to meet the FCC's EMI rules, and that in the past, the company has shielded its VDTs to meet the "most conservative" global EMI standards.

There are no statistics available on the number of VDTs still in use that were manufactured without shielding.

Emphasis Differs

The summary places a different emphasis than the original report on the importance of findings by the Delgado team in Spain that pulsed magnetic fields can cause teratological effects in chicken embryos. The summary discounts the possibility of a relationship between the Delgado fields and those from VDTs, but the full report states that a "relationship could exist," although it is "highly unlikely."

Guy said in a telephone interview that recently reported corrections in the Delgado team's experimental set up have not altered his assessment (see *MWN*, December 1984). He noted, however, that the revised information is more consistent with physical science than the original data.

Characterizing the Fields

The full report also assessed measurement problems faced by VDT researchers and recommended time domain methods using simple loops and Maxwell displacement current sensors for "predicting induced currents and energy absorption in exposed subjects." Frequency domain methods, such as those used in EMI measurements, are "not adequate for completely characterizing the fields."

Guy suggested that direct measurements of induced current to ground in a subject "may be the most convenient and accurate method for characterizing worst case exposure conditions." He concluded that the "maximum coupling of energy would occur...when the hands are in contact with the case of the VDT."

He measured maximum peak electric field levels of 30-100 kV/m for "direct hand contact with the surface" of an unshielded Hazeltine 1500 terminal, according to the report, with fields at the operator's position as high as 50 V/m. Guy told *Microwave News* that he was "shocked" by these levels. Overall, he said he found that shielded terminals reduced the fields by an order of magnitude such that the fields at the operator's position were less than 5 V/m.

Guy calculated that the total rms E-field from a VDT's flyback transformer is approximately double the field associated with the fundamental frequency. For the Hazeltine terminal, the E-field at 18.478 kHz (the fundamental frequency) at the casing surface was 14.2 kV/m, while the total E-field was 28 kV/m. This total is in line with the 38.2 kV/m field Guy measured from the same terminal.

IBM Radiation Research Continuing

IBM's Mattia told *Microwave News* that the company is measuring extremely low frequency (ELF) radiation from its terminals as part of its ongoing research program.

Guy said that he will present a paper based on the full report at the Bioelectromagnetics Society meeting in San Francisco in June. He also plans to submit the paper to the society's journal, *Bioelectromagnetics*.

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Confusion Over EPA ELF Research

There appears to be some confusion among senior officials at the Environmental Protection Agency (EPA) over the work going on in its own labs. Some believe that bioeffects research on extremely low frequency (ELF) or power line radiation has been completed and can be terminated, while others see the need to continue the work which has just begun.

Testifying before Congress on March 5, EPA Assistant Administrator for Research and Development (R&D) Dr. Bernard Goldstein explained why the non-ionizing radiation group at the Health Effects Research Lab in Research Triangle Park, NC, will be disbanded under the Reagan Administration's fiscal year 1986 (FY86) budget (see *MWN*, March 1985).

Goldstein told the subcommittee on natural resources, agriculture research and environment of the House Committee on Science and Technology that, "The reduction is due to the completion of health studies on the effects of extremely low frequencies [ELF] of non-ionizing radiation. The information produced by the program should provide a sufficient data base for EPA to establish exposure guidelines." Congressman James Scheuer (D-NY) is the chairman of the subcommittee.

Last August however, Sheldon Meyers, the acting director of EPA's Office of Radiation Programs, wrote to officials in the state of New Jersey that EPA would continue its work on ELF (or power line) radiation. He noted that EPA would provide assistance to those states which "do not have the resources to conduct the [R&D] necessary to promulgate exposure limits..." (see the complete text of Meyers's letter in "From the Field" on p.11).

Most of EPA's R&D work, with some notable exceptions, has been on radiofrequency and microwave (RF/MW) radiation. In 1983 Congress asked EPA to step up work on ELF and most of it is just getting underway (see *MWN*, June 1983).

At a hearing before the subcommittee on HUD and independent agencies of the House Appropriations Committee on March 20, Goldstein faced tough questioning from Congressman Edward Boland (D-MA), the subcommittee chairman. Boland quizzed Goldstein and EPA Administrator Lee Thomas on why EPA was closing the radiation program when the agency had asked for an increased budget last year, especially after EPA's Scientific Advisory Board had recommended continued funding.

The EPA officials replied that there were few effects of RF/MW radiation "at the levels of interest to EPA." They said that they would supply the subcommittee with additional information for the hearing record.

Meanwhile, a lobbying campaign has been started to pressure Congress to restore funding for the EPA non-ionizing radiation research group. Officials of the Bioelectromagnetics Society, the IEEE's Committee on Man and Radiation (COMAR) and the Electromagnetic Energy Policy Alliance (EEPA) are all working towards that goal.

A staffer with the Scheuer subcommittee said that while there was some sentiment among committee members that the research program should continue, it was still "too premature" to say whether the funds would be restored. He explained that there had been a large number of cuts and that the Congress would be facing some "tough decisions." The subcommittee will consider the budget request in mid-April.

An aide to Boland's subcommittee said that there is no clear sense among the members that the funds should be restored. No schedule for subcommittee action has been set, he added.

Ironically, at the same time that EPA is trying to disband the non-ionizing radiation group, it has awarded prizes to some of the group's members for excellence in research. The 16-member group collected the top award for *all* agency health-related papers, as well as three other prizes. Only five other awards were given out to the rest of the Health Effects Lab, where about 250 researchers work.

HS Student on PEMF Effects

Jarrett Shustrin, a student at South Shore High School in Brooklyn, NY, has found that pulsed electromagnetic fields (PEMFs) "doubled the rate of cell growth in [human] melanoma cells." Shustrin exposed the melanoma cells in tissue culture to 72 Hz PEMFs for five hours a day over five days and counted the cells each day.

His project was exhibited March 18-22 at the IBM Gallery of Science and Art in New York City as part of the 47th School Science Fair held by the American Institute of Science and Technology.

Shustrin, working in the Surgical Research Laboratory of biochemist Joseph Scherrer at the Brookdale Hospital Medical Center in Brooklyn, was inspired by the work of Dr. Andrew Bassett of the Department of Orthopedic Surgery at Columbia University Medical School, one of the pioneers in the use of PEMFs for hard-to-heal fractures.

For his work, Shustrin won a "Junior Academy of the New York Academy of Sciences Award," which consists of a one-year membership in the academy, a t-shirt, and a certificate from the U.S. Marine Corps. (The top five prize winners won $2,500 scholarships from ITT.)

Power Line Studies at IEEE PES Meeting

Outlined below are some of the papers on transmission line effects presented at the Institute of Electrical and Electronics Engineers' (IEEE) Power Engineering Society winter meeting, held in New York City on February 3-8. (The order numbers of the papers follow the titles.)

- "Probability and Consequence of Gasoline Ignition

under HVAC Transmission Lines," (85 WM 224-1). Using computer simulations, Dr. Don Deno of General Electric and Mike Silva of Enertech evaluated the likelihood of fuel ignition caused by sparks during refueling for various types of trucks and automobiles along the right-of-way (ROW) of a 500 kV line. They found that the risk for an automobile is less than one in a trillion. The greatest probability is for a trailer truck on a blacktop road: approximately one in seven million. If a spark were to cause ignition, an explosion would be very unlikely, the researcher found.

• "Testing of Railroad Signal Equipment for Power Line Interference Susceptibility Part I: The Test Jig" (85 WM 113-6) and "Part II: Test Results" (85 WM 114-4). Much of this work has already been reported (see *MWN*, September and December 1983). Allen Taflove, formerly with IITRI and now an associate professor at Northwestern University in Evanston, IL, John Dunlap of the Electric Power Research Institute and Raymond Zalewski of IITRI advise utilities "to work with the railroads to set up measurement procedures (or procurement standards) to test each item of vital railroad signal equipment that may be subjected to AC interference. Both safe failures and false clear failures should be tested."

• "Measurement and Statistical Analysis of Ozone from HVDC and HVAC Transmission Lines," (85 WM 226-6). A team from Hydro-Quebec and its research institute (IREQ) led by L. Varfalvy found that, in most cases, a 735 kV AC line had negligible effects on ambient levels of ozone. Even in worst case situations, the maximum contribution of the power line will not exceed 5-10 parts per billion along or near the ROW. For a ± 900 kV DC line during bad weather conditions, the maximum contribution to ozone levels could be quite significant.

• "Analysis of Effect of Shield Wires on Electrostatic Induction by AC Transmission Lines," (85 WM 223-3). A group of Japanese researchers has devised a model for the effectiveness of shield wires on the ground level electric field. Measured values were in good agreement with the group's calculations.

• "Exposure to Transmission Line Electric Fields During Farming Operations," (85 WM 225-5). Mike Silva and Dennis Huber of Enertech have estimated the exposures experienced by farmers whose property is crossed by various types of power lines. For instance, for a 765 kV line, a farmer would spend about 20 hours a year in fields above 3 kV/m and one hour in fields above 8 kV/m. They note that the cabs of most farm machinery shield workers to a level of five percent of the unperturbed electric field outside the cab.

Single copies of the above papers are available for $3.00 (IEEE members), $6.00 (others) from: Single Publication Sales Dept., IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854.

A tutorial on "Power System Harmonics," held at the PES meeting, was well attended, attracting about 75 participants. The course text (84 EH0221-2-PWR) is available for $8.00 (IEEE members), $16.00 (others).

FCC on Radiation Hazards

(continued from p.1)

ANSI standard. The time and effort needed to prepare an EIS is such that most applicants will design their facilities to comply with the ANSI limits, one FCC staffer said.

Indeed, an FCC attorney told *Microwave News* that since NEPA became law in 1969 the commission has written fewer than six EIS's. None of these addressed RF/MW radiation.

Technical Bulletin

The FCC is preparing a technical bulletin to help evaluate compliance with the new rules. According to Dr. Bob Cleveland of the commission's Office of Science and Technology, the bulletin will help broadcasters predict field strengths from antennas and will review measurement procedures. Cleveland said that the bulletin would be updated as needed. He also said that the commission will consult with staffers at the Environmental Protection Agency (EPA) in developing the bulletin. In addition, the National Association of Broadcasters has offered its assistance.

In adopting the radiation rules, the FCC acknowledged the absence of federal standards but argued that, "We believe the fact that there are currently no mandatory federal standards for exposure of the public to RF radiation does not excuse us from our obligations under NEPA to evaluate the FCC actions for significant environmental impact."

The new rules will apply to: (1) radio and television broadcast stations, (2) experimental broadcast stations including radio transmitters, (3) low-power television stations and (4) transmitting satellite earth stations.

In a separate action, the FCC proposed to exclude categorically land-mobile transmitters and microwave point-to-point relay links from the NEPA requirements. The commission also proposed to apply the rules to shipboard satellite earth terminals. In so doing, the commission asked interested parties to respond to a series of questions on worst case exposures, field strength prediction models, measurement methods and other related issues.

No Federal Preemption

In explaining its decision, the FCC noted that:

• Though standards more restrictive than ANSI's are being proposed and adopted by national and international organizations, the commission decided not to wait for the "ultimate standard," but to act on the basis of the available record. The commission advised that "we may revisit this issue and recommend use of a different standard in the future."

• Though a number of commenters called for the agency to quash the movement towards state and local safety standards in the absence of federal rules, the commission said that, after having given the matter "serious consideration," it had decided not to resolve the issue of federal

preemption at this time. But it warned that, "Should non-federal RF radiation standards be adopted, adversely affecting a licensee's ability to engage in commission-authorized activities, the commission will not hesitate to consider this matter at that time."

• Though the FCC had originally proposed to key its actions under NEPA to the Occupational Safety and Health Administration's (OSHA) 10 mW/cm^2 standard, because the OSHA standard was based on the old ANSI standard, which was revised in 1982, the commission decided to base its rules on the more recent guidelines.

Dr. Robert Powers, FCC's chief scientist, will outline the new rules at a panel discussion on non-ionizing radiation at the *Annual Convention of the National Association of Broadcasters* in Las Vegas, NV, the week of April 14. And Cleveland will address the rules at the May 14-17 *Annual Meeting of the Electromagnetic Energy Policy Alliance* in San Diego, CA. Excerpts of the FCC's "Report and Order" appear below.

The FCC began considering radiation hazards in 1979 when it issued a Notice of Inquiry (NOI). In February 1982, the commission proposed the rules which it has now adopted with some revisions (see *MWN*, March 1982). Nineteen organizations filed comments and reply comments on the FCC's proposal (see *MWN*, September 1982). Comments on the new proposal are due on June 19, with reply comments due on July 19.

The "Report and Order" appears in the March 20 *Federal Register*, (50 *FR* 11151), and the proposed revision appears in the March 18 *Register* (50 *FR* 10814). For more information, contact FCC's Cleveland at (202) 632-7040 or Stephen Klitzman at (202) 632-6405. ●

EXCERPTS

FCC's RF Human Exposure Rules Under NEPA

Reprinted below are excerpts from the Federal Communications Commission's (FCC) rules to consider radiofrequency (RF) hazards under the National Environmental Policy Act (NEPA). All footnotes have been deleted from the original FCC text, which appeared in the March 20 Federal Register *(50* FR *11151). These rules are part of FCC's General Docket No. 79-144. They were adopted on February 26 and released on March 14.*

Summary

1. The Commission is amending Part 1 of its rules implementing the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 *et seq.* (1976). The amendment provides for environmental analysis of major Commission actions that may result in non-compliance with applicable health and safety guidelines for radiofrequency (RF) radiation. Our processing guideline for determining the significance of human exposure to RF radiation will be the "Radio Frequency Protection Guides" adopted in 1982 by the American National Standards Institute (ANSI). At this time, the rule amendment will only apply to major actions taken by the Commission with respect to the following facilities authorized by the FCC Rules and Regulations: (1) broadcast facilities authorized under Part 73; (2) broadcast facilities authorized under Part 74 (Subparts A and G only); (3) satellite-earth stations authorized under Part 25; and (4) experimental facilities authorized under Part 5. An accompanying *Further Notice of Proposed Rule Making*, also being issued today, proposes to categorically exclude other FCC-regulated facilities and operations from the provisions of this rule, except for shipboard satellite-earth terminals.

II. Background

2. On June 7, 1979, the FCC issued a *Notice of Inquiry* (NOI) concerning the responsibility of the FCC to consider biological effects of radiofrequency (RF) radiation when licensing facilities and authorizing equipment that utilize RF energy....

3. As a result of the comments received in response to the FCC's NOI and our assessment of the Commission's statutory responsibilities under NEPA, the Commission issued a *Notice of Proposed Rule Making* (NPRM) on February 18, 1982, proposing...that applications for equipment authorizations would be treated as "major actions" triggering environmental assessment when the equipment in question did not comply with RF radiation emission standards. It was also proposed that applications for construction permits or licenses to transmit would be treated as "major actions" triggering environmental assessment when the proposed operation would result in the exposure of workers or the general public to levels of RF radiation in excess of safe levels established by federal agencies which have jurisdiction to set such standards.

III. Discussion

A. General

4. A total of twenty-three filings of comments and reply comments was received at the FCC in response to the Commission's NPRM in Docket 79-144....The respondents included individuals, broadcast groups, major corporations, trade associations, a labor union, local government officials, and the U.S. Environmental Protection Agency (EPA)....

5. With a few exceptions, respondents to the NPRM generally supported the thrust of the Commission's proposal. The general tone of the comments indicated a desire by many respondents that the Commission clearly establish a policy regarding RF radiation hazards and clarify Commission and licensee responsibilities in this area of growing public concern. Several of the respondents also suggested the Commission take actions that, we believe, go beyond the scope of this proceeding. Although various broadcast groups, such as the National Association of Broadcasters (NAB), the TV Broadcasters All Industry Committee (TVBAC), the Association for Broadcast Engineering Standards, Inc. (ABES), and the National Association of Public Television Stations basically supported the proposed rule, they and others urged the Commission to issue a policy statement dealing with federal preemption of local and state standards for RF radiation....

6. Two respondents felt that the Commission should not adopt the proposed rule amendment at this time. The Utilities Telecommunications Council (UTC) recommended "that the Commission postpone adoption of its proposal until the EPA or another responsible federal agency establishes a legally enforceable exposure standard." UTC felt that it would be premature for the

FCC to adopt its proposed rule in view of the fact that various federal agencies "are only in the preliminary stages of standard development and in light of the disparate views and positions of scientists the world over concerning what constitutes a radiation 'hazard'...."

7. Similarly, RCA Corporation, while endorsing the concept of national standards and while recognizing the proposed Commission regulation as "meritorious," nonetheless felt that the Commission should "defer adoption of the regulations implementing NEPA until such time as the Federal agencies issue suitable radiation standards." RCA feared that if the Commission adopted regulations before the issuance of federal standards, "such regulations may be ineffective, inappropriate, or detrimental to those persons regulated thereunder." The UTC and RCA comments, however, were outweighed by those comments supportive of our taking action at this time.

8. It is our judgment that the Commission is required to make a threshold determination as to whether the facilities it approves are "major Federal actions significantly affecting the quality of the human environment," thus triggering environmental review, regardless of whether federal guidelines or standards currently exist for general public exposure to RF radiation....

B. Guidelines for RF Radiation Exposure

9. A major topic of discussion among the respondents was the matter of which RF standard or guideline the Commission should use as its criterion for identifying a "major action" for processing under the NEPA rules. The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor has jurisdiction to establish RF exposure standards for workers. EPA has the authority to recommend safe levels for exposure of the general public to RF radiation. Our NPRM noted that OSHA had previously issued a radiation protection guide for workers, and that, until a federal standard for the general public was developed, we proposed to use the OSHA workers' exposure guidelines for determining what constituted a "major action" with respect to general public exposure to RF radiation. In May 1982, OSHA proposed to revoke its advisory standards, including the advisory standard for exposure of workers to non-ionizing radiation. However, subsequently, OSHA reconsidered and decided to retain its advisory standard for RF radiation.

10. In light of OSHA's proposed revocation, some respondents felt that the Commission should reconsider its proposal to use the OSHA guidelines....Other parties, including most of the broadcast groups, did not think that OSHA's action should affect the Commission's proposal....

11. GTE Service Corporation, Aeronautical Radio, Inc. (ARINC), [American Radio Relay League] ARRL, Thomas Agoston, Donald E. Clark, and Motorola, Inc. advanced an alternative approach. They proposed that, in place of the OSHA guidelines, the Commission should use, as an interim or provisional standard, the voluntary RF radiation protection guides issued in 1982 by the American National Standards Institute (ANSI)....

13. Although several of the broadcast groups would have preferred that the Commission use the OSHA radiation protection guide, they indicated that use of the ANSI standard would be acceptable. For example, to quote TVBAC, "while the ANSI standards are more stringent than the 10 mW/cm^2 standard at certain frequencies, they are not so stringent as to impair broadcasting services."...

17. Significant misgivings about Commission use of the OSHA guidelines were expressed from another perspective in comments of EPA. EPA noted that, "in general, we are in agreement with the subject document as written, but we have reservations about the use of the OSHA occupational standard as an interim standard for exposure of the general public until EPA issues guidelines for exposure of the public." EPA observed that factors related to environmental heat stress and the health of exposed individuals suggested that the OSHA standard may not provide adequate protection for certain segments of the public."...

19. Reservations about FCC adoption of the OSHA guidelines were also expressed in comments submitted by Oregon officials Donald E. Clark and Dr. Charles P. Schade. For example, Schade maintained that occupational exposure standards "do not protect persons in the population who might be especially sensitive to radiofrequency energy." He mentioned small children and persons with chronic illnesses as examples of individuals who might be adversely affected by the Commission's use of an occupational standard as a standard for exposure of the general public.

20. There were two reasons for our initial proposal to rely on the OSHA occupational standard as an interim guideline for exposure of the general public. First, no standard had been established by the Federal Government for exposure of the general public to RF radiation. Second, as indicated in the NPRM, we believed that some guideline is necessary to facilitate the Commission's environmental review process until such time as EPA or another responsible federal agency recommends or adopts guidelines or standards for exposure of the general public to non-ionizing RF radiation....

22. Absent a federal standard for exposure of the general population, and in the face of the Commission's acknowledged statutory obligation under NEPA, two questions, therefore, remain. Under these circumstances can the Commission rely on existing exposure guidelines in view of the lack of federal standards? If it can, upon which guidelines should it rely?

23. First, we believe that the Commission can rely on existing exposure guidelines as long as they are technically sound and scientifically supportable....

24. Second, regarding the exposure guidelines on which the Commission will rely, in light of recent developments, and as a result of comments received in this proceeding, we are modifying our original proposal for evaluating RF radiation exposure. We are incorporating by reference into our NEPA rules the guidelines recommended by ANSI...

25. We have selected the non-government ANSI guidelines to evaluate general population and worker exposure to RF radiation because they are scientifically based and widely accepted guidelines that are applicable to the general population as well as to workers....Although we have neither the expertise nor the jurisdiction to *develop* our own radiation exposure guidelines, we believe, as supported by comments received in this proceeding, that the Commission does have the expertise and authority to *recognize* technically sound standards promulgated by reputable and competent organizations such as ANSI. The OSHA radiation protection guide upon which we had originally proposed to rely was based directly on the prior ANSI standard of 10 mW/cm^2 originally issued in 1966. ANSI's revision of that standard, in 1982, reflected recently acquired knowledge of the biological effects of RF radiation. We, therefore, believe that the 1982 ANSI standard is more appropriate than the OSHA advisory guideline. Furthermore, the OSHA guidelines were written as an exposure guide for workers, whereas the 1982 ANSI recommendations "are intended to apply to non-occupational as well as to occupational exposures." The revised ANSI guidelines also apply to a broader frequency range than the OSHA guidelines and, unlike the OSHA guidelines, contain recommendations for exposure in the standard (AM) broadcast band.

26. We would prefer to defer in this area to the expert federal health and safety agencies. We believe, however, that NEPA requires us to consider the environmental impact of the operations and facilities we license or approve, regardless of whether federal standards currently exist or we have the requisite expertise to set such standards....

27. ...If a proposed operation or facility will result in human exposure in excess of the ANSI limits, environmental analysis will be required. However, the application can be amended to reduce or eliminate the possibility for excessive exposure....

28. We are aware of new or proposed recommendations for exposure to RF radiation promulgated by other organizations subsequent to the issuance of our NPRM. For example, new exposure guidelines, more restrictive than the ANSI standard for exposure of the general public, were released in April 1984 by the International Radiation Protection Association (IRPA). The National Council on Radiation Protection and Measurements (NCRP) is currently developing RF exposure guidelines for workers and the public. In addition, the American Conference of Governmental Industrial Hygienists (ACGIH) and the National Institute for Occupational Safety and Health (NIOSH) have recommended or are developing recommendations for occupational exposure to RF radiation, and...EPA has been in the process of developing federal guidelines for RF exposure. While IRPA has now issued guidelines and other groups may do so in the future, we believe that the Commission should act on the basis of the record before us at the present time rather than postpone action indefinitely as we seek the ultimate standard. It is possible that we may revisit this issue and recommend use of a different standard in the future. However, for the present, the record before us supports use of the 1982 ANSI standard.

C. License Renewals and Modifications

29. We have determined that we are legally obligated under NEPA to include license renewal and facility modification applications within the scope of our environmental processing guidelines. To clarify as well as qualify the applicability of our amended NEPA processing rules to such applications, we would note the following points. First, both the NEPA case law and regulations of the Council on Environmental Quality implementing the statute make clear that the statutory term "major Federal action" includes both new and continuing federal activities such as initial licensing as well as license renewals and modifications....

31. ...Based on industry comments received in this proceeding, it is our expectation that, in fact, the vast majority of license renewal and facility modification applications will comply with the ANSI standard we are incorporating today into our NEPA processing guidelines. Thus, our approval of such applications in most instances will not constitute a "major Federal action significantly affecting the quality of the human environment" so as to trigger environmental processing with respect to RF radiation....

D. Evaluation of Compliance

32. Many respondents raised questions that related to the evaluation of whether a facility or operation was in compliance with a given standard. For example, American Telephone and Telegraph (AT&T) expressed its concern that "the intent of the proposed rule is not sufficiently clear and...this slight ambiguity may result in an unnecessary burden to the Commission as well as applicants."...

33. Concern over measurement procedures, particularly in the near-field of a radiating source, was expressed by some respondents. Motorola felt that adoption of the proposed rules without establishing measurement procedures was "in effect, adoption of no rules at all...Enforcement of the rules could be next to impossible in near-field situations. We urge the Commission to promulgate rules *only* after appropriate measurement procedures have been established...."

35. In its comments, NAB also discussed the problem of locations where many different sources of RF energy are present. NAB contended that "in some instances, there is no practical alternative but to locate a variety of transmitting antennas on one tall building or mountain peak. At these locations, the cumulative radiation levels might exceed the new ANSI standard —but almost never in any area accessible to the public." NAB suggested that the Commission should consider various methods to prevent exposure to hazardous radiation at these sites but maintained that "no licensee or applicant should be subjected to special processing where transmitting equipment under that licensee's control by itself produces radiation levels not in excess of the standards."

36. In order to address these various concerns related to the determination of compliance with standards, and to give guidance to our licensees, we plan to issue a technical bulletin which will be developed by Commission staff before the effective date of our rule amendment. This bulletin will discuss prediction methodology, evaluation of exposure situations, measurement problems, multiple source siting, and other relevant issues....

39. Concerning the problem of multiple transmitters at the same location, if a proposed facility or modification would result in an incremental increase in RF radiation in an accessible area causing overall non-compliance with the specified guidelines, then we can see no practical way to address this situation other than to require an environmental assessment of the proposal. *Existing* facilities that are not proposing modifications in their operations or are not applying for renewal would not be subjected to NEPA processing under our rules. In the case of renewals at multiple-use sites, all licensees involved will be *jointly* responsible for resolving problems that may arise relative to exposure to RF radiation. Further guidance on evaluation of multiple-use situations will be provided in the bulletin....

F. Federal Preemption of Local and State Standards

42. We continue to be aware that, largely due to the lack of a federal standard, various state and local jurisdictions around the country either have adopted or have proposed standards for exposure of the general public to RF radiation. The issue of federal preemption of such local and state RF standards was a recurring theme in many of the comments....

43. We have reviewed these comments closely and given the matter serious consideration. However, we do not believe it is necessary at this time to resolve the issue of federal preemption of state and local RF radiation standards. Should non-federal RF radiation standards be adopted, adversely affecting a licensee's ability to engage in Commission-authorized activities, the Commission will not hesitate to consider this matter at that time.

G. Other Issues

44. Various respondents raised a few other issues, mostly dealing with particular operations or exposure situations. For example, the Radio Officers Union (ROU) of the National Marine Engineers' Beneficial Association, AFL-CIO, submitted comments pertinent to the maritime mobile service. Although ROU could foresee no RF hazards associated with conventional maritime radio transmitters and ship radar equipment, the union felt that shipboard satellite earth stations posed a potential hazard that should be promptly addressed by OSHA and the FCC....Accord-

ing to ROU, the primary hazard of such equipment results from their antennas frequently being mounted only a few feet above deck level. The union also expressed concern about port operation of satellite equipment with regard to tankers, LNG carriers, ammunition ships, and similar vessels, as well as the potential for exposure of persons standing dockside.

45. Some respondents urged the Commission to exclude certain types of transmitters from consideration under the NEPA processing rules because of the apparent incapacity of these devices to cause potentially hazardous exposure to RF radiation. For example, Motorola mentioned portable radios operating between 300 kHz and 1 GHz with output powers of seven watts or less. NAB suggested an exemption for mobile electronic news gathering ("ENG") equipment used by broadcasters. According to NAB, "these services also pose virtually no health hazard because of the transient nature of the exposure." NAB further urged the Commission to exclude all transmitters with power outputs below ten watts from the environmental assessment rules. Similarly, ARINC urged the Commission to exclude the aeronautical mobile service from consideration under Section 1.1305, and ARRL proposed an exemption for amateur radio....

IV. Conclusions

55. Maximum power limitations for broadcast facilities authorized under Part 73 range from 50 kilowatts (AM radio) to over 5 megawatts (UHF television). Also, for applicable Part 74 facilities there are no limitations on maximum power under Subpart A (experimental broadcast stations), and under Subpart G (low power television) no maximum for effective radiated power is stipulated. Therefore, these various broadcast facilities may operate with effective radiated powers (ERP) of thousands to millions of watts. Since broadcast transmitters are sometimes located in areas that are accessible to workers or the general public, and broadcast stations generally transmit over major portions of a 24-hour day, it is possible that such transmitters could cause exposures in excess of safety standards. Moreover, comments filed previously in this proceeding presented evidence that it is possible for some broadcast facilities to create conditions that might lead to significant human exposure to RF radiation.

56. Transmitting satellite-earth stations authorized under Part 25 of the FCC Rules and Regulations operate with very high ERPs. However, the high degree of directionality of the transmitted beam makes excessive exposure unlikely. Our experience over the past several years in this area and on-site measurements have demonstrated that normal design and operating practice make it highly unlikely that workers or the general public would be exposed to excessive levels of RF radiation from these facilities. Nevertheless, we believe it necessary to subject these facilities to the provisions of this rule because of the high amounts of RF energy involved. Similarly, experimental facilities authorized under Part 5 may operate with relatively high power levels, and, therefore, will be subject to this rule amendment.

57. It should be noted at this point that we have already been reviewing radiation hazards of land based satellite-earth stations as part of our domestic satellite-earth station licensing process since our 1972 *Memorandum Opinion and Order* in Docket No. 16495. Since the rule amendment we adopt today will be applicable to satellite-earth stations authorized under Part 25 of the FCC Rules, it will supersede the 1972 action.

58. With regard to other categories of FCC-regulated operations and facilities, because of relatively low operating power levels, intermittent use, or relative inaccessibility, it appears unlikely that they would cause exposure in excess of safety standards during routine use. Therefore, we are today also issuing a *Further Notice of Proposed Rule Making* in which we propose to exclude from the provisions of this rule other transmitting facilities and sources which are not included in the categories listed above. Through this *Further Notice* we are soliciting information, comments, opinions, and suggestions relevant to the legitimacy of this proposed categorical exclusion....even though we are proposing to exclude a large number of Commission actions from consideration under this rule, the Commission "on its own motion or on motion of any interested person, may determine that the environmental consequences of a particular action are such as to warrant preparation of an environmental impact statement."...

59. In our *Further Notice* we are also proposing the inclusion of shipboard-satellite earth stations...

60. ...We believe that the overwhelming majority of applications to the Commission will not be subject to environmental impact analysis as provided for in our NEPA rules and by this amendment....

UPDATES

COMPATIBILITY & INTERFERENCE

Aircraft RFI... In our November issue, we reported that the FAA announced plans to set rules clearly permitting the use of computers and other electronic devices in flight — except during takeoffs and landings. The release caught a number of people by surprise because the RTCA Special Committee 156 (SC156), which had been asked to evaluate the EMI risk to aircraft avionics and communications equipment, had not yet completed its work (see *MWN*, October 1983). Jack Flavin, manager of the avionics branch in the FAA's Office of Air Worthiness in Washington, DC, told *Microwave News* that the press release was issued because, after checking with RTCA, there seemed to be little chance of EMI, and because there was a lot of passenger confusion due to conflicting rules among the various airlines. "The phone was ringing off the hook," he said. Flavin added that the advisory circular, cited as forthcoming in the release, did not now have a high priority within the agency and there were no immediate plans for its release. In a telephone interview, Frank White, the chairman of SC156, said that he hoped to complete a working draft of the committee's report by its next meeting on April 23-24 and a final report by the end of the year. White pointed out that some data for certain frequency bands must still be collected and that the measurement program is ongoing — in part because some of the necessary test equipment is not yet available. FAA's Flavin said that if SC156 finds something, "we will change the rules."

NBS to Study Test Methods... The Electromagnetic Fields Division at NBS's Boulder labs in Colorado will try to resolve an ongoing debate on the preferred test method for evaluating the susceptibility of home electronic equipment

to conducted EMI from the power line and the VHF and UHF antenna ports (see *MWN*, January/February 1985). Under the leadership of NBS's Mark Ma, models will be developed to see "if a correlation can be achieved between injection testing methods and radiated field methods." That is, staffers will compare the results obtained from a bench setup with those from an open area test site. The study is being carried out under a $100,000 contract from the Electronic Industries Association. An NBS spokesman said that the final report should be completed by the end of September.

GOVERNMENT

First Cuban Interference Claim... The FCC has approved its first compensation payment — to Plough Broadcasting Co., Inc. — under the Radio Broadcasting to Cuba Act of 1983 (see *MWN*, November 1983). AM station WSUN is now eligible to receive $12,265.24 for "expenses incurred in modifying its transmitter facilities to offset the effects of Cuban interference to its daytime service area." The actual monetary award will be made by the U.S. Information Agency. WSUN was allowed to increase daytime power in June 1983 because of Cuban interference. At that time, the station was owned by Plough; it was later sold to Taft Radio and Television Co., Inc.

The Bulletins Are Back... The *Radiological Health Bulletin* and the *Medical Devices Bulletin*, both published by FDA's Center for Devices and Radiological Health, will be back in print in April after a five-month hiatus. FDA was forced to suspend publication of the two newsletters when the Office of Management and Budget (OMB) failed to renew their approval — the previous authorization expired at the end of the last fiscal year, on September 30. The go-ahead finally came in early March and the bulletins will once again be available without charge. For more information, contact the Division of Information Services, Office of Management and Systems, Center for Devices and Radiological Health, FDA, Rockville, MD 20857.

MEASUREMENT

Magnetic Measurements... According to an NBS survey, nearly all of the 481 companies and research organizations involved with magnetic technology favor the creation of a federal facility for magnetic measurements and calibration. It should have the capability to measure all common magnetic parameters and to handle unusual shapes and sizes of samples, according to the survey respondents. NBS also found that "extreme measurement accuracy is not generally necessary": one percent is adequate in most cases — though even this is often hard to achieve. When asked how such a program should be supported, respondents expressed a willingness to pay "reasonable" fees but not the entire cost of setting up and maintaining the lab. *Magnetic Measurements, Calibrations, and Standards: Report on a Survey* (NBSIR No. 84-3018) by F.R. Fickett of NBS's Electromagnetic Technology Division, is available from the National Technical Information Service (NTIS), Springfield, VA 22161, $7.00, prepaid. Order No. PB 85-127827.

MEETINGS

Japanese Symposium... The Japan Health Physics Society (JHPS) will hold its 20th annual meeting in Kyoto on May 13-14. On the agenda is a symposium on "Some Problems on Health Physics of Non-Ionizing Radiation," which will be chaired by Dr. Y. Honda of Kinki University. For more information, contact: JHPS, c/o Kyoto University Research Reactor Institute, 590-04 Osaka-fu, Sennan-gun, Kumatori-cho, Noda, Japan, 81-7245-2-0901.

MILITARY APPLICATIONS

Opposition to EMPRESS II... Samuel Q. Johnson, III, a Democrat representing the 37th District in the Maryland House of Delegates, introduced *House Joint Resolution 67*, which seeks to stop the Navy from siting the Electromagnetic Pulse Radiation Environment Simulator for Ships (EMPRESS II) in the Chesapeake Bay. On March 20, the House Environmental Matters Committee approved *HJR 67* by a vote of 22 to 1. It will now go to the full house.

POWER LINES

Freak Accidents... Seven people were electrocuted March 23 attempting to escape a fire caused by a downed power line in Jupiter, FL, according to UPI. As the people climbed into a car, 7,620 volts of electricity surged through one of the car doors as it touched an adjacent car that was in contact with the downed line....Then on March 26, woodpeckers caused a utility pole to fall, taking with it a 230 kV transmission line. An estimated 170,000 Florida Power Corp. customers in the Tampa area were blacked out, UPI reported.

RADAR

Radar Detectors... Radar detectors are illegal in some states and are tempting to thieves everywhere. One device which overcomes both of these problems are the new "remote-mount detectors" which can be placed under the hood and linked to a display next to the driver. Twelve companies now make them, and *Car and Driver* magazine presents the results of rigorous comparison tests in its March issue. The units, which range in price from $220 to $445 (though some are available at a discount), are sensitive to both K- and X-band microwaves. They were rated on the basis of the warning distance provided in three types of police traps, a torture test to simulate under-the-hood wear-and-tear and their propensity to false alarms. The detectors ranged in performance, but the editors at *Car and Driver* found that Cincinnati Microwave's new, small Passport and its older Escort models scored better than any remote detectors.

IEEE Special Issue... The February 1985 issue of the *Proceedings of the IEEE* is devoted to radar, with 14 papers on various topics. The issue is introduced by Dr. Merrill Skolnik of the Naval Research Lab in an overview, "Fifty Years of Radar." What's left out of the issue is also of

interest. According to the April issue of *The Institute*, the IEEE newsletter, two Lincoln Lab engineers from Lexington, MA, did not receive clearance from the U.S. Army and so had to withdraw their paper on "High Power 35 and 95.5 GHz Instrumentation Radar," which describes an advanced radar system designed to gather high-resolution diagnostic signature data on R&D missile flights. The IEEE, the Army and the Lincoln Lab are discussing who will pay the expenses for the mix-up.

STANDARDS

IEC & Industrial EMC... The International Electrotechnical Commission (IEC) has issued the third part of its new standard, *Electromagnetic Compatibility for Industrial-Process Measurement and Control Equipment*. Publication No. 801-3, *Part 3: Radiated Electromagnetic Field Requirements*, details test procedures for determining the susceptibility of industrial equipment to spurious signals and recommends severity levels. The IEC points out that walkie-talkies are the most common sources of EMI but also lists radio and TV transmitters, welders and fluorescent lights as other sources of interfering electromagnetic energy. The IEC specifies the use of shielded enclosures as the "most efficient" means of performing radiated susceptibility tests and favors the anechoic chamber as "the most preferred type of enclosure." With respect to the stripline circuit, the IEC notes that, as specified in MIL-STD-461 and 462, the stripline is of "limited application" due to restrictions on the size of the equipment under test and its maximum frequency of operation (35 MHz). TEM cells are relegated to the appendix because they "can only accommodate very small items." In the frequency band 27-500 MHz, the IEC sets out three severity levels for measuring degree of susceptibility. Class 1: 1 V/m, a low-level radiation environment with radio and TV stations more than 1 km away; Class 2: 3 V/m, a moderate electromagnetic environment with walkie-talkies more than 1 meter from industrial equipment; and Class 3: 10 V/m, a severe electromagnetic area, typical of high-power walkie-talkies next to control equipment. (A fourth level is left open for "situations involving very severe electromagnetic radiation environments.") Publication 801-3, which includes detailed drawings of various test set-ups, costs $36.00 plus postage. It will be available soon from the International Sales Office, American National Standards Institute, 1430 Broadway, New York, NY 10018, (212) 354-3300. For details on Parts 1 and 2, see *MWN*, January/February 1985.

SAE AE-4 & ANS C63...SAE Committee AE-4 on EMC met on March 26-27 in Albuquerque, NM, and the next meeting of American National Standards Committee C63 on EMC has been scheduled for 9 a.m. on May 24 at the EEI in Washington, DC. C63's Subcommittee 1, on Techniques and Developments, will meet on May 23 at 10:30 a.m., also at the EEI. For more information on AE-4, contact SAE's David Bentley at (412) 776-5760; and on C63, contact IEEE's Fred Huber at (212) 705-7960.

TECHNOLOGY

Microwave Drying... The Electric Power Research Institute (EPRI) has contracted with Professor Philip Schmidt of the University of Texas's Mechanical Engineering Department in Austin to devise ways of optimizing the use of microwave energy in order to make it cost-effective in drying applications. At present there are no analytical models to test which combinations of microwave and conventional heating systems work best. Under the $57,194 contract, Schmidt will develop such a model — specifically for heating and drying porous solids internally by microwaves and from the surface by infrared radiation and convection. He will then test the results with a bench-scale setup. The work should be completed by the end of 1985.

ULTRASOUND

Chromosomal Effects... An attempt to replicate the reported finding that diagnostic ultrasound can increase the frequency of sister chromatid exchanges (SCE's) has failed. (SCE's are a sensitive indicator of potential genetic or carcinogenic hazards.) In 1979, a group at Albert Einstein College of Medicine in the Bronx, NY, reported that ultrasound, as used to monitor the developing fetus, increased the incidence of SCE's in human lymphocytes (*Science, 205*, 1273, 1979). Now, a team led by Dr. V. Ciaravino of the University of Rochester, using the same clinical device, found "no significant effect" on SCE's among human lymphocytes exposed in vitro. In a paper published in the March 15 *Science*, they conclude that "the reasons for [the original] results may be coincident with some subtle yet unidentified procedural factor." Dr. Robert Bases of the Department of Radiology at Albert Einstein, one of the authors of the 1979 study, told *Microwave News* that he was preparing a reply for publication in *Science*. He said that he would prefer not to comment further on the new results at this time.

VDTs

Australian Radiation Measurements... Researchers at the Australian Radiation Laboratory (ARL) have concluded that electromagnetic emissions from VDTs "do not pose a health hazard to operators" after testing fifty color and monochrome units. Electric and magnetic fields were measured from 14 kHz to 100 MHz, and broadband readings were taken from 10 MHz to 26 GHz. Maximum fields measured at 30 cm were: 3.1 V/m for E-fields from color VDTs, 15 V/m for one monochrome unit; 78 mA/m for H-fields from color terminals, 76 mA/m for monochrome. Median field levels in all categories were considerably less. ELF fields were not measured, and no ionizing radiation was detected — the minimum detection level of the meter was 0.05 mR/hr. For a copy of the report, *Electromagnetic Emissions from VDTs* (ARL/TR067), write to the ARL, Lower Plenty Road, Yallambie, Victoria 3085, Australia.

Legislation...New Mexico Governor Toney Anaya has signed *Executive Order 85-11* regulating the purchase and use of VDTs by state agencies. Other states are considering

the following bills: **California** Assembly Bill No. 1006 (Assemblyman Tom Hayden's second VDT bill this year), **Iowa** Senate File 322 (Senator Charles Bruner) and companion House File 329 (Rep. Gary Scherzan), **Massachusetts** House Bill 1501 (Rep. Nicholas Buglione) and House Bills 3082, 3084, 3085 and 3089 (Rep. Timothy Bassett), **Rhode Island** Bill Nos. H5387 and H6079 (Rep. Edward Dambruch) and Bill No. H6128 (Rep. Robert Tucker), and **Washington** substitute House Bill 468 (Rep. Janice Niemi) replacing legislation proposed earlier.

ETC...

Moscow Bugs... Electronic bugs placed inside typewriters used at the U.S. embassy in Moscow may have helped Soviet intelligence agents learn highly classified secrets, CBS News revealed on March 25. The listening devices transmitted signals to antennas hidden in the embassy's walls, which then broadcast the information to Soviet listening stations. The bugged typewriters were in use from 1982 until 1984, when the bugs were discovered. (In 1960, U.S. officials announced that they had found a bug in 1952 in a "Great Seal" that had been hanging over the Ambassador's desk — the seal had been a gift from the Soviets.) This latest episode follows upon years of controversy about the Soviets' beaming microwaves at the U.S. embassy for reasons that have never been explained fully, though some experts have argued that the microwaves recharged the batteries that powered the bugs.

FROM THE FIELD

VDT Radiation: Guy's Report for IBM

Reprinted below are the recommendations of Dr. Bill Guy to IBM in his October 29 report, Health Hazards Assessment of Radiofrequency Electromagnetic Fields Emitted by Video Display Terminals. *See story on p.2.*

Though it is highly unlikely that there is any relationship between the birth defect clusters and VDT emissions, the clinical work on magnetic bone growth stimulators and the magnetic field work of Ubeda et al. (1983) replicated by Mild (1984) does indicate that there could be a relationship. This perceived relationship prevails even though the wave form of VDT emissions differs markedly from those of bone growth stimulators and the Delgado apparatus. A major question, however, is the validity of the bone growth stimulation work and the reported effects by Ubeda et al. Until this validity issue is resolved, critics will use the results of the above works to argue that the level of emissions from VDTs are not safe. The localized E-fields at the surface of an unshielded cover of a VDT nearest the flyback transformer can reach extremely high values as a result of the associated high voltage and close proximity of the transformer to the cover. Since these fields have a capability of inducing much greater currents in an exposed user of the device than the relatively low magnetic field emissions it certainly is desirable to shield the cover of the VDT. Since such shielding is relatively inexpensive the benefit to cost ratio is large. Such shielding is generally present in newer models of VDTs to satisfy FCC requirements for reducing electromagnetic interference. Since the magnetic fields emitted by the VDTs are significantly lower and induce much less current in an exposed subject, there is less need to provide magnetic shielding. Therefore unless it can be shown that there is a real hazard due to the magnetic field exposure such cost may not be warranted. Since the Ubeda, et al. (1982) work implies that there may be a hazard, however, the work should be replicated and the data carefully analyzed to determine whether further research is needed to answer the questions concerning the applicability of the results to the VDT magnetic field waveform. Such work should be carried out by a team of highly reputable teratologists and engineers to minimize or eliminate possible artifacts in the exposure systems and the biological assay protocols. Also a careful and thorough characterization of the induced fields and currents in subjects exposed to VDTs should be carried out and the levels compared to levels known to be safe, based on the most reputable scientific literature.

EPA on ELF Research

Reprinted below is the text of a letter from Sheldon Meyers, acting director of the Environmental Protection Agency's (EPA) Office of Radiation Programs, to Eugene Fisher, assistant director of the Division of Environmental Quality in New Jersey's Department of Environmental Protection in Trenton. See story on p.3.

August 24, 1984

Dear Mr. Fisher:

I am writing in response to your July 31, 1984, letter in which you and Mr. Weiss, Chairman, New Jersey Commission on Radiation Protection, petition the Environmental Protection Agency to initiate development of guidance to limit exposure of the public to electromagnetic fields from high voltage power lines.

Over the next several years, the Agency will be collecting information that will be useful in determining if there is a need to develop guidance for controlling exposure to the fields produced by high voltage power lines. Our activities will include (1) continuing to closely monitor the results of the biological effects research supported by the Department of Energy, the Electric Power Research Institute, and the State of New York, (2) continuing to support the efforts of the National Council on Radiation Protection and Measurements to collect and analyze the biological effects literature, (3) extend the capability of the Agency's biological effects research in this frequency range, and (4) continue to collect and analyze data on ambient electric and magnetic fields.

Your letter raises two very valid points. First, that some States do not have the resources to conduct the research and development necessary to promulgate exposure limits and, second, that there is a potential for individual States to adopt different limits. I hope that as work in this area proceeds we will be able to provide you the assistance you need. However, it will take at least 2 to 3 years to collect the information and perform the analyses that will be required to determine if guidance or some other method of control is required.

Sincerely yours,
Sheldon Meyers, Acting Director
Office of Radiation Programs (ANR-458)

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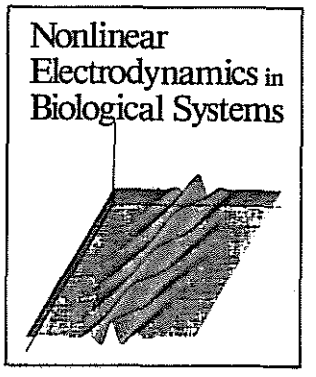

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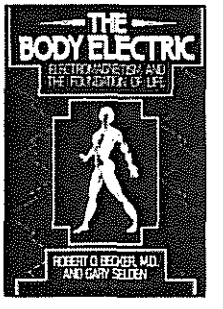

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