

**REPORT OF THE RF SAFETY COMMITTEE
TO THE
ARRL BOARD OF DIRECTORS**
January 2001

The RF Safety Committee has participated in the following areas over the past six months:

1. RF Safety Committee Activities.
2. Monitoring recent scientific studies regarding RF Safety.
3. Participation in the scientific RF Safety community.
4. Administrative issues (Committee membership, Email reflector, Web Pages).
5. Future Plans (Rewriting RF Safety text).

1 RF Safety Committee Activities

- 1.1 In preparation of the RFSC Web Page, the committee searched the QST archives for RF Safety-related articles and reviewed each one. A link to all approved articles was included on the RFSC Web Page. The committee evaluated each paper for accuracy in terms of current knowledge about RF effects. Some of the publications were excluded on that basis.
- 1.2 On September 1 the FCC RF Safety guidelines went into effect for all amateurs. A statement about this was reviewed by the committee and published in the ARRL Letter.
- 1.3 Dr. Lapin, on behalf of the committee, replied to an ARRL member's letter, that appeared in the November issue of QST, that took issue with the RFSC's aid to the NCI epidemiological study of radio amateurs. The RFSC reply also appeared in that issue.
- 1.4 Mr. Hare identified a poorly written RF Safety question that had made it into the new Technician question pool. The committee discussed the wording and possible remedies, and recommended that the question be removed from the pool.
- 1.5 A question was raised about the safety of operating amateur radio by pacemaker users. The committee reviewed the section of the ARRL Web that deals with this issue. Dr. Lapin contacted a colleague at the FDA to get a more definitive answer and the question was forwarded to the responsible party at FDA. No reply has been received as yet.

2 Monitoring Scientific Studies

- 2.1 In July it was announced that the SAR values of commercially available cellular telephones in the United States would be published. SAR values, whether measured or calculated, are the defining factor upon which RF Safety regulations are based.
- 2.2 In July, a Spanish judge in Barcelona ruled that a power company was liable for the maladies claimed by people living near their transformers, even though there was no

- scientific basis for the claims. The judge also stated that the same principle would hold for RF energy.
- 2.3 In August, the former director of the WTR (Wireless Technology Research study group of the Cellular Telephone Industry Association), George Carlo, published a "web-based peer reviewed article" that purported to summarize the risks due to cellular telephones found in WTR supported research. As usual, Carlo had a large presence in the popular press and warned company CIOs that they would be held legally responsible under OSHA regulations if employees were harmed by wireless devices in the performance of their duties. The committee discussed Carlo's paper and statements and did not find his arguments to be compelling, identifying several errors in the scientific report.
 - 2.4 In August a Maryland neurologist filed an \$800 million lawsuit against Verizon Wireless, claiming that their cellular telephone service caused his brain tumor. While not the first suit of its kind, it was given more credence in the press because a supposedly learned scientist was involved. The committee discussed this and found no more bases to this case than any of the others.
 - 2.5 In October, the eminent scientist Prof. Ronald King of Harvard University published a modeling paper in IEEE Transactions on Microwave Theory and Techniques (T-MTT). The paper calculated absorption of RF at 6-meter frequencies in humans and specifically singled out hams as being at risk. A second, similar paper was published in the November issue of IEEE T-MTT. Dr. Guy identified a number of errors in the modeling technique, which was antiquated and has been improved upon. Dr. Lapin identified many errors in Prof. King's statements that treated the amount of RF absorption in the body as a causal factor in disease. Drs. Lapin and Guy wrote a reply to both of Prof. King's papers on behalf of the ARRL RF Safety Committee. The reply was accepted for publication by the editor of IEEE T-MTT and will be published, along with another reply by Dr. William Bridges of Stanford University and rebuttal comments by Prof. King, in the April 2001 issue of IEEE T-MTT.
 - 2.6 In October, cellular telephones in Great Britain were to be labeled with a warning against usage by children. This was a direct result of report of the Stewart Commission earlier in the year (The Stewart Commission Report was discussed in greater detail in the July 2000 RFSC Report to the ARRL Board of Directors).
 - 2.7 In November, the FCC released Report and Order 00-408, which addressed the rights of local governments to regulate antenna structures. The committee's review of this document indicated that it was directed toward cellular and PCS antenna and did not mention the Amateur Radio Service. This document was a follow-up to the one written by the FCC Local and State Government Advisory Committee (LSGAC) to help local governments understand the RF Safety implications of these antennas. That earlier document (which was described more fully in the July 2000 RFSC Report to the ARRL Board of Directors) mentioned Amateur Radio but clearly was not directed toward regulation of our antennas.
 - 2.8 In November the press publicized an article in Lancet by a British physicist, Dr. Gerard Hyland. In short, Dr. Hyland proposed the theory that the human brain is like a radio receiver that could be interfered with by radio transmitters. He also made some incorrect statements about why children would be more susceptible to damage from RF than adults.

The committee's review of the abstract of this article indicated that it contained more opinion than fact, and had little scientific backing. We later learned that Lancet had not subjected Dr. Hyland's paper to peer review, and considered it to be an opinion piece. However, these latter facts were not publicized.

- 2.9 In December the Good Housekeeping Institute published an analysis of the efficacy of cell phone shields. They determined that none of them reduced absorption of RF in the head.
- 2.10 In December two epidemiological studies of cellular telephone users were published, one by the National Cancer Institute and the other that was funded by Wireless Technology Research. Both studies found no statistical link between cell phone use and brain cancer. Both studies cautioned that they had not yet examined if any effects existed from long-term use.
- 2.11 In December a British professor developed a directional antenna for cellular telephones that, he claimed, decreased RF absorption in the head. He is currently trying to sell his invention to someone.
- 2.12 In December, the law firm of Peter Angelos announced ten lawsuits against the British cellular telephone company, Vodafone, totaling several billion dollars. Angelos has been linked with George Carlo and there have been rumors that the lawyer is financing Carlo's current work.

3 Participation in the Scientific RF Safety Community.

- 3.1 Dr. Lapin continues writing a monthly column about RF Safety for the ARRL Members Only Web Page. The article titles for the last half of the year are: "Taking RF Safety Regulations on the Road," "Understanding SAR," "The Multiple Transmitter Question," "RF Safety and the Neighbor," and "What's Different about RF Safety in Great Britain?" The publication of each article on the ARRL Web continues to elicit a fair number of mostly favorable responses from hams.
- 3.2 Dr. Lapin continues to review scientific papers for IEEE Standard C95.1, which is being revised during the coming year.
- 3.3 Dr. Lapin serves on the IEEE Committee on Man and Radiation, which develops informational text about various issues regarding the effects of nonionizing radiation on humans and medical devices. COMAR also publishes position papers about the dangers, or lack thereof, of various technologies with respect to nonionizing radiation.
- 3.4 Mr. Hare and Dr. Guy continue to serve on the IEEE Standards Coordinating Committee 28 on Non-Ionizing Radiation, which develops the standards for human exposure to RF energy.
- 3.5 Dr. Guy participated in responding to questions on maximum RF current and current density limits in IEEE SCC28 Safety Standards Interpretation Committee.
- 3.6 Dr. Guy participated in writing new guidelines for computation and measurement of 1gram average SAR values in human models exposed to RF fields in IEEE SCC 34 SC2 Subcommittee on Cellular Phone Certification.

- 3.7 Dr. Gold has worked with local amateurs to help them understand and comply with the FCC RF Safety guidelines.
- 3.8 Mr. Myers continues to serve on the American Conference of Governmental Industrial Hygienists Physical Agents TLV Committee.
- 3.9 Following the announcement that SAR values of commercially available cellular telephones in the United States would be published, Dr. Lapin wrote an article as part of his RF Safety Column describing SAR. The same text was modified for an audience of cellular telephone users and will be published by IEEE Committee on Man and Radiation as a Technical Information statement.
- 3.10 Mr. Hare, as the ARRL Representative to IEEE SCC28, brought a question to the committee regarding a discussion and vote about the status of the pinna (the tissue of the outer ear) in the RF Safety standard. A radical member of SCC28 contended that the pinna could cause damage if it is stimulated by high levels of RF, referencing some obscure literature about the vagus nerve. The committee discussed the issue and concurred that the pinna should be classified as an extremity, which affords it a higher permissible exposure, and that is how Mr. Hare voted.

4 Administrative Issues

- 4.1 In July, Mr. Haynie appointed James Ross, M.D., M.P.H., W4GHL, to be a new member of the RF Safety Committee. Dr. Ross is an ARRL member with a background in epidemiology, a field in which the committee is taking an increasing role, and will also serve to maintain the balance of scientists and medical doctors on the committee. He has taken an active role in committee activities.
- 4.2 Mr. Hare continues to administer the RF Safety committee email reflector, which handles correspondence between committee members. Other ARRL staff members and some former committee members monitor traffic over the reflector and we occasionally receive helpful comments from them. We now have the capability to review things that were discussed in the past.
- 4.3 The committee developed an RF Safety Committee Web Page that sits as a subset of the ARRL website (www.arrl.org/rfsafety). Access to RF Safety information on the ARRL site was thus simplified. The RFSC Web Page contains a mission statement and committee description. There is professional information about each committee member, a pointer to frequently asked RF Safety questions, a list of ARRL RF Safety publications, copies of past RFSC Reports to the ARRL Board, and links to other RF Safety-related sites.
- 4.4 Dr. Lapin's RF Safety column articles were moved from the ARRL Members' Only site and were made publicly accessible, as linked to by the RFSC Web Page. The reasoning behind this was to try to draw other members of the scientific RF Safety community to the ARRL RFSC pages so that they would gain acceptance and stature among that group.
- 4.5 Mr. Hare created a working web page for RFSC use. The page was developed to contain lists of RFSC members, pointers to works in progress, such as the RF Safety text rewrite

project, and Powerpoint slides that can be shared among committee members who are giving RF Safety presentations.

- 4.6 Mr. Sumner nominated Dr. Lapin to fill an opening on the FCC Technical Advisory Council, representing ARRL RFSC on that body. The result of that nomination have not yet been announced by the FCC.

5 Future Plans

- 5.1 The committee continues to consider restructuring of the RF Safety text that appears in all ARRL publications.
- 5.2 The committee will continue to monitor the NCI epidemiological study of radio amateurs, and help the investigators maintain the highest level of accuracy. There have been no progress reports from NCI since last Spring.

Gregory Lapin, Ph.D., P.E., N9GL
Chair, ARRL RF Safety Committee

The ARRL RF Safety Committee

Chair

Gregory D. Lapin, Ph.D., P.E., N9GL
1206 Somerset Ave
Deerfield, IL 60015-2819

Committee Members

Robert E. Gold, M.D., WB0KIZ
9197 N. Clydesdale Road
Castle Rock, CO 80104-9102

William Raskoff, M.D., K6SQL
1769 Escalante Way
Burlingame, CA 94010-5807

Arthur W. (Bill) Guy, Ph.D., W7PO
18122 60th Place NE
Seattle, WA 98155-4608

James W. Ross, M.D., M.P.H., W4GHL
9472 Ruffin Ridge Rd.
Mechanicsville, VA 23116-6670

Gary E. Myers, M.S., C.I.H., K9CZB
28W 135 Hillview Drive
Naperville, IL 60564

Kai Siwiak, P.E., Ph.D., KE4PT
10988 NW 14th St
Coral Springs, FL 33071-8222

Liaison to the ARRL Board of Directors

Howard Huntington, K9KM
25350 N. Marilyn Lane
Hawthorn Woods, IL 60047

ARRL HQ Staff Liaison

Ed Hare, W1RFI
ARRL Headquarters
225 Main Street
Newington, CT 06111

ARRL HQ Administrative Liaison

Lisa Kustosik, KA1UFZ
ARRL Headquarters
225 Main Street
Newington, CT 06111