

REPORT OF THE RF SAFETY COMMITTEE

TO THE

ARRL BOARD OF DIRECTORS

July, 1998

The past 6 months have been active for the RF Safety Committee. An enormous effort by Ed Hare, W1RFI, with assistance from the committee, resulted in the publication of an RF Safety book for use by the amateur community. The committee has a new chairman, Gregory Lapin, Ph.D., P.E., N9GL, and the former chairman, William Raskoff, M.D., K6SQL, remains as a member of the committee to assist with its operations.

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

1. Assisting in the preparation of ARRL *publications (RF Safety and You, General Class License Manual)*.
2. Monitoring recent scientific studies regarding RF Safety (NIH Panel).
3. Participation in the scientific RF Safety community (Meeting with FCC personnel, Speaking to amateur radio clubs, Participation in other RF Safety related committees).
4. Administrative issues (Email reflector, literature search tools).
5. Future Plans (Rewriting RF Safety text, Articles in *QST* and *QEX*).

1 ARRL Publications

1.1 The new ARRL book, *RF Safety and You*, was the result of a concerted effort by Ed Hare, W1RFI. The book was introduced in February 1998, within one month of the initiation of new FCC RF Safety regulations for the amateur service. This book was prepared in record time with changes to the proposed FCC regulations instituted as late as November 1997, in part due to the influence of Mr. Hare (see section 3). The entire RF Safety Committee participated in the preparation of this book, with a couple members writing sections and everyone reviewing text and submitting comments. *RF Safety and You* quickly sold out its first printing. Comments from Jerry Ulcek, of the FCC Office of Engineering and Technology, were extremely favorable: "...you and the ARRL have put together an RF exposure book that has a wealth of information in it and far surpasses the humble, yet useful, supplement that the FCC put out...If we get interested parties looking for more information in this area, I will forward them to the ARRL to get a copy of this book. Once again, congratulations on a well put together and thought out book that is simple to use and helps to cover a void in an area that really needed it."

1.2 The new FCC regulations require the addition of RF Safety related questions to the Amateur license question pools. The RF Safety committee participated in the editing of the RF Safety related sections of the new *ARRL General Class License Manual*, written by Larry Wolfgang, WR1B. The wording of these sections was corrected and clarified in many cases by consensus of the committee members.

2 Recent Scientific Studies

2.1 The major reports of scientific studies in the past 6 months have been mostly based on ELF energy. This is of concern to radio amateurs, since there is increased exposure to 60 Hz EM fields due to the close proximity of the amateur to power supply transformers that carry relatively large currents. However, it is not an area that is covered by Part 97 of the FCC regulations.

2.2 The most far-reaching report is the recent determination of a panel organized by the National Institutes of Health (NIH), that ELF fields contribute to the initiation of cancer. This report is in direct opposition to the determination of the National Council on Radiation Protection (NCRP), that has repeatedly determined that this is not so. The NIH panel, in making this statement, has qualified it by saying that the chances of contracting cancer from ELF fields are extremely small. Responses to this are pending.

2.3 Perhaps the most disturbing study of RF Bioeffects has been the 1996 study of Lai and Singh, from the University of Washington, which claimed to detect DNA breakage due to exposure to energy similar to that of cellular telephones (850 MHz, XX mW/cm²). If true, this could redefine our definition of ionizing radiation and would greatly increase the cancer risk due to RF fields. Since then, other laboratories have failed to reproduce these results. Dr. Lai was given funding to reproduce his own work under controlled conditions, in the laboratory of Dr. CK Chou in California. These studies were performed this past Spring and the results are pending.

3 Participation in the Scientific RF Safety Community

3.1 In October-November 1997, Dr. Robert Cleveland spoke at an IEEE Engineering in Medicine and Biology Society conference in Chicago, IL, organized by Dr. Gregory Lapin. Mr. Ed Hare attended that meeting and met Dr. Cleveland. These three sat together and reviewed the soon-to-be introduced FCC RF Safety regulations. Mr. Hare was instrumental in effecting changes to the rules at that time.

3.2 Following the IEEE meeting, Drs. Cleveland and Lapin and Mr. Hare spoke about RF Safety at a meeting of the North Shore Radio Club in Highland Park, IL. Over 100 amateur radio operators attended this seminar and the talk was very well received.

3.3 Dr. Lapin met with Dr. Cleveland at the FCC offices in Washington, DC on April 3.

3.4 Dr. Lapin gave an RF Safety talk at the annual meeting of the Medical Amateur Radio Council (MARCO), held in conjunction with the Dayton Hamvention on May 16, 1998.

3.5 Dr. Lapin is currently planning EM Effects sessions and a course on EM Bioeffects for the 1998 IEEE Engineering in Medicine and Biology Society conference in Hong Kong. The conference will be held from October 29 through November 1, 1998. Once again, he has invited Dr. Cleveland to participate.

3.6 Mr. Hare and Dr. Guy, W7PO continue to serve on the IEEE Standards Coordinating Committee C95.1, which develops the standards for human exposure to RF energy.

3.7 Dr. Guy continues to serve on the National Council for Radiation Protection (NCRP), which analyzes current scientific knowledge in RF Bioeffects and develops exposure standards.

4 Administrative Issues

4.1 Mr. Hare has set up an RF Safety committee email reflector, which handles all correspondence between committee members. Sending email to the reflector address (rfsc@arrl.org) distributes the message to all people on the list. Replies can also be sent to the entire list. This has greatly simplified communication amongst the committee members and has proved invaluable in the timely review of text that is being prepared for publication.

4.2 Jim Maxwell, W6CF, has started to create a complete committee list that includes personal and business telephone numbers, email addresses, and abbreviated *Curricula Vitae* for all members of the RF Safety Committee.

4.3 Mr. Hare and Dr. Lapin are working on a system to help the committee become aware of recent developments in the scientific RF bioeffects arena. Committee members who have subscriptions to related journals have been asked to relay any pertinent titles and abstracts to the committee via email. We are also considering subscribing to a literature search service that will provide titles and abstracts of all related papers as they are published.

5 Future Plans

5.1 The RF Safety text that is now being reprinted in the *ARRL Handbook*, the *ARRL Antenna Book*, *RF Safety and You*, and the *ARRL General Class License Manual* is virtually identical. A revision of this text, which brings it up to date with current scientific reports, will also divide the text into subject areas. This

way, future ARRL publications will be able to select different sections that are pertinent to the subject matter of the publication. For instance, it is not necessary to include a discussion of epidemiological research in the RF Safety text of a license manual. When subdivided in this way, it should also be easier to update sections rather than reviewing the entire document every time a change is made.

5.2 While at the Dayton Hamvention this year, Dr. Lapin noted that there were no seminars related to RF Safety. He has contacted the organizers of the Hamvention to suggest that the 1999 Hamvention include such a seminar and has volunteered to staff it.

5.3 We would like to consider submitting a monthly RF Safety column to *QST*.

5.4 We have noted that, as an oversight, we missed the opportunity to discuss RF Safety at Field Day sites in *QST*. Dr. Lapin is preparing an article for *QST* about how this was done at the 1998 North Shore Radio Club Field Day site for publication this fall and another article on the subject is planned for the June 1999 issue of *QST*.

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Chair, ARRL RF Safety Committee

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