REPORT OF THE RF SAFETY COMMITTEE
TO THE
ARRL BOARD OF DIRECTORS

July 2008

The RF Safety Committee 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.

1 RF Safety Committee Activities

1.1 The committee responded to the concerns of a ham who was interested in buying a cell phone and wanted advice on selecting a phone based on reported SAR values. The response was that regardless of a given telephone's exposure value, all phones on the market are below the IEEE standard's threshold, which is based on the best scientific data developed over the past 40 years and has an additional safety factor of 50 times below the actual safety threshold.

1.2 The committee responded to a ham who saw an article about cell phones damaging sperm (see 2.2 below) and was concerned about using his ham radio equipment. We told him that we had reviewed that study and felt that it was very poor science and that it had not been subjected to peer review, thus we felt that its results could not be trusted at this time.

1.3 The committee was made aware of recent decisions for radio amateurs in France regarding their form of environmental assessment. For 6 years the French national amateur radio society (REF-Union) has been negotiating with their radio administration about the responsibilities of amateurs to conform to exposure levels. The REF-Union convinced the administration that the type of operating and the power levels used by amateurs made nonconformance with exposure levels very unlikely. As such, French radio amateurs do not need to do anything further to demonstrate their conformance.

1.4 The committee responded to the concerns of a ham who was building a new house and wanted to install a Windom antenna around the eaves. He was concerned that the living quarters in the middle of the house would be unsafe if surrounded by this antenna. He was advised that he should perform an environmental assessment and that most wire antennas have compliance distances of only a few feet with a 100 watt transmitter.

1.5 The committee responded to an amateur who had a dilemma with his club's repeater antenna. It had been installed on a tower along with several commercial antennas. The repeater antenna needed repair but the exposure regulations for someone climbing this tower with active antennas prevented them from doing so. They could not afford professional climbers and the commercial stations would not shut down their operations during the repair operation. They may have been looking for the RF Safety committee to bless their over-exposing a club member in order to make this repair, which is something we could not do. The best we could suggest was to have someone climb the tower with a

survey meter and to see if the repair could be made before the 6 minute average exceeded the MPE at that frequency.

1.6 The committee was informed about a video making its way around Internet showing cell phones pointed at raw popcorn and causing it to pop when the phones were switched on (see, for example, http://www.youtube.com/watch?v=ud2x1BXogZ8). This video naturally concerned a lot of people about the safety of their brain cells when near a cell phone, and we even heard from hams who extended this concern to their transmitters. This hoax was developed by a marketing company that was selling Bluetooth hands-free devices, apparently with the goal of scaring people about putting cell phones next to their heads. The hoax is revealed in the following video: http://www.metacafe.com/watch/1399627/cell_phone_popcorn_hoax_revealed/

1.7 The committee discussed at length the RF safety implications of a paper that appeared in QST describing an antenna that was fed with ladder-line connected directly between the transmitter and the antenna. As the ladder line could be close to people in the room the question was raised as to whether it would produce fields in excess of MPEs. Numerical analysis methods showed that there might be some concern within 1 foot of the feed line with transmissions in the 10 meter band at 100 watts output. However, the intermittent nature of amateur radio transmission brings the 30 minute average exposure well below the MPE. Another concern that was raised was that this type of feedline can generate high surface voltages that could be hazardous if touched, even if the wire is insulated.

1.8 The committee responded to a ham who questioned the safety of magnetic fields from AC power lines. The ARRL Handbook text was recently revised to update our knowledge about biological effects of this energy and this text was sent to the ham in reply, along with some comments from committee members.

2 Monitoring Scientific Studies

2.1 The committee discussed a study claiming that use of cellular telephones before bed causes people to take longer to fall asleep, causing headaches and confusion. The article about this study was premature since this research was not published in a peer-reviewed article but rather at a symposium. They used 71 subjects to answer two questions: one if sleep is affected by prior RF exposure and the other if self-assessed electrosensitive individuals can tell if they are being exposed. Regarding the sleep study, the statistics were not overwhelmingly conclusive and the measured differences in time to deep sleep and duration differed by only a few minutes. Before this study can be taken seriously it must be better designed and subjected to significant peer review.

2.2 The committee discussed another study in which patients at an infertility clinic were questioned about their cell phone use. The results showed an association between cell phone use and sperm damage. Once again this is a poorly designed study since the subjects were all patients at an infertility clinic. There was no inclusion of cell phone users who do not have infertility problems as a control group. If this research ever survives peer-review the committee will take another look at it.

2.3 The committee discussed an article about an epidemiological study of heavy cell phone users that claimed to show an increase of salivary glands tumors. The problem with the data was that it was based on a relatively small group of subjects and was looking for a very rare type of cancer. This study also contradicts the several epidemiological studies with very large study groups that found no increase in any cancer incidence.

2.4 The committee was made aware of an article touting the dangers of electromagnetic fields and offering a solution that plugs into any outlet in the home and both reduces stray EMFs and also reduces electric bills by 25%. This was clearly an ad by one of the many charlatans who tries to profit from people's fears. Another clue was that the "article" confused power line EMF with cell phone radiation. It quoted, "USA Today calls EMF the #1 environmental health concern of today." Further research into this found that many anti-EMF websites make similar claims about a USA Today study (such as, "USA Today conducted a survey of 4567 readers and reported that EMF pollution is the #1 environmental concern in America today."). However, a search of the USA Today website archives found nothing that was even close to these statements.

2.5 The committee was contacted by a confrontational brain tumor researcher, who claimed that his colleagues in Sweden and Japan had told him how microwave energy caused increased brain tumor development. We responded that as a scientist he should be aware of the difference between anecdotal evidence and scientific study. His colleagues' studies were not published, as we had never heard of them. When that is weighed against thousands of studies over 40 years that do not show any increase in brain tumors from exposure to RF energy, the only reasonable conclusion is to trust the peer-reviewed and replicated science.

3 Participation in the Scientific RF Safety Community.

3.1 Dr. Lapin continues to serve on the IEEE Committee on Man and Radiation (COMAR).

3.2 Mr. Hare continues to serve on the IEEE Standards Coordinating Committee 28 on Non-Ionizing Radiation, which develops the standards for human exposure to RF energy. Mr. Hare maintains a list server for communications among members of this committee, and occasionally cross-pollinates pertinent issues between the RFSC and SCC-28 list servers.

3.3 Dr. Lapin continues to serve as a reviewer for RF Safety-related papers submitted to IEEE Transactions on Microwave Theory and Techniques.

3.4 Dr. Siwiak presented "Low Profile RadioSport" based on the QST article to the South Florida DX Association, Motorola ARC, Lighthouse ARA, Browards ARC, and Gold Coast ARA, focusing on RF Safety in DXing with an indoor antenna.

3.5 Dr. Siwiak helped Juan Peiro, EA5BLP, with RF Safety question on his 1m HF loop mounted on a balcony.

3.6 Dr. Guy tutored and provided resources to AM broadcast station KRKO, Everett, Washington concerning RF safety issues. The information was necessary to obtain approval from hearing examiner for adding additional antennas and an increase in power from 5 kW to 50 kW without violation of safety standards or subjecting public to any health hazards. The examiner favorably approved to the station's application.

3.7 Dr. Lapin has testified about the health implications of RF energy at several local cell tower siting hearings.

4 Administrative Issues

4.1 To facilitate the identification of RF safety issues in ARRL publications many members of the RFSC have been included in the list of ARRL Technical Advisors. This gives us access to the manuscripts that are being considered for publication in QST and QEX. The committee intends to periodically review these and to identify those that either have clear RF safety implications or those that need further clarification by the author.

4.2 The RFSC is considering recruiting one or more additional members with expertise in areas that are not currently well covered, such as pacemakers and behavioral responses to RF exposure.

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