

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

January 2018

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 has begun a discussion of the need for additional educational materials for radio amateurs related to RF safety. The original definitive book on the subject, RF Safety and You, is no longer in print but a scanned PDF version is available. However, it is not easily editable, which would make any update difficult to perform. There are RF safety sections in the ARRL Handbook and the ARRL Antenna Book, as well as limited discussions of the topic in various license manuals, though it was noted that the RF Safety Committee is no longer asked to review the question pools. FCC OET Bulletin 65 and its supplements are still available but they have not been updated in almost 20 years. The Committee is still considering what the appropriate educational material for radio amateurs will consist of and will also consider other means of disseminating the information in addition to the written materials that have been used in the past.
- 1.2 The Committee was contacted by a radio amateur who questioned the safety of signals operating at the maximum 1-watt limit in the 2200-meter band. The Committee considered that with such long wavelengths most exposure is in the near field, while most calculations are based on the far field. Also, there are few antennas in that band that resonate without the use of capacitors and inductors. The potential exists for high energy fields being built up around these devices. The Committee concluded that further study was needed for signals in this new band.

2 Monitoring Scientific Studies

- 2.1 The Committee reviewed an editorial about recent pronouncements by the World Health Organization's International Agency for Research on Cancer (WHO's IARC). The opinion piece called out some of the extreme conclusions that the IARC has recently made and their disproportionate effect on public opinion.
- 2.2 A recent study of the brain development of children whose mothers used cellular telephones while pregnant was reviewed by the Committee. A large group (45,389) of mothers with children born several years prior was surveyed about their cellular telephone use during pregnancy and their child's language, communication and motor skills at ages 3 and 5. The control group was made up of the 10% of that group that did not use, or rarely

used, cell phones during their pregnancies, with the remainder of the study group divided by the amount of use: low (a few times a week, 39%), medium (daily use, 47%) and high (at least an hour a day, 4%). The study result showed no adverse effect of cell phone use on the development of the children. Interestingly, this study resulted in a lower risk of developmental problems for children whose mothers used cell phones during pregnancy. The Committee commented that this study could have been afflicted with recall bias about cell phone use several years earlier and it also depended on the mothers relaying accurate information about their children's language development. Also, there was no control of other effects of parenting on a child's development. However, this was an interesting initial study of humans on this topic, which had previously only been studied on small numbers of laboratory animals and had mixed reports that exposure during pregnancy may, or may not, have harmed the fetuses' brains.

- 2.3 The Committee discussed a recent trend in meta-analysis papers that looked at many other studies on a single topic and then performed statistics on the combined results. In one case, the meta-analysis showed a preponderance of intracranial and salivary tumors (tumors that were in the head) that were associated with RF exposure. Comments about this technique of summarizing data from many studies included the observation that it was a single outlier laboratory, from Lennart Hardell in Sweden (who the Committee has discussed several times in the past) that made all of the other results seem significant. A major problem with the meta-analysis is that if a single biased laboratory that publishes prolifically is combined with studies from all of the other laboratories that study the same thing, it is possible that even if there is agreement among all of the other laboratories, the biased studies can still overwhelm them statistically. The authors gave additional weight to the outlier studies by not considering studies that had cell phone usage of less than 5 years, none of which were from Hardell's laboratory. Even after this type of meta-analysis was performed and statistical significance was on the side of RF being harmful, the odds ratio was very low.
- 2.4 In a confusing development, the California Department of Public Health issued guidelines on "How to Reduce Exposure to Radio Frequency Energy from Cell Phones." It seems that an early draft of the document was released prematurely and it caused a furor in the popular press. The department put the document through the appropriate reviews and then released a final version that was toned down. It changed wording, such as "What do we know about cell phones and health" to "Why are people concerned about exposure to RF energy from cell phones." They also qualified that rather than the health department recommending reducing exposure from cell phones, they were merely give guidance to those who wanted to reduce their exposure. Evidently, an anti-exposure advocate from Berkeley discovered that CDPH was drafting an exposure document and got a court order to compel them to release it. What they were forced to release was not complete and had not been reviewed.

3 Participation in the Scientific RF Safety Community

- 3.1 Mr. Hare continues to serve on the ICES (IEEE) SCC-28 RF Safety Standards Committee.
- 3.2 Dr. Lapin continues to serve as a member of the IEEE Committee on Man and Radiation, COMAR.

- 3.3 Dr. Siwiak serves as a consultant to the Q-Track Corporation on matters of RF exposure related to body mounted small MF and HF transmitting loops.
- 3.4 Dr. Siwiak developed the accredited continuing education course, “Cell Phone and RF Exposure Awareness,” which is offered online by SunCam Corporation.
- 4 Administrative Issues
- 4.1 Dr. Siwiak is a contributing editor for QST and Editor of QEX, and he shares any submitted RF Safety-related articles with the Committee.

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