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

January 2012

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 received a query from a ham who was concerned about the WHO reclassification of electromagnetic radiation as a "possible carcinogen" (see the June 2011 RFSC report) and wondered why there are not specific absorption rate results for handheld radios like are required for cellular telephones. The Committees answers to this were in three parts: 1) the WHO classification is virtually meaningless, 2) the use of the word "radiation" to describe electromagnetic waves should not be confused with ionizing radiation, and 3) unlike full duplex cellular telephones, which transmit continuously, handheld radios are half duplex and only transmit when the push-to-talk button is pressed, which is not expected to be significantly long with respect to the averaging times specified in the exposure standards.

1.2 The Committee continues to discuss potential exposure hazards of loop antennas. The issue came to light recently because of the publication of a loop antenna article in the November 2011 issue of QST. Dr. Siwiak had reviewed this article prior to publication and suggested that a safety warning be added to the article. However, in retrospect, the safety warning that was added was not considered to be strong enough. The article mentioned the possibility of driving a small loop antenna with 1500W and reasonable safety is generally realized with this type of antenna when power is less than 200W. Dr. Siwiak submitted a safety discussion of loop antennas for publication in the Technical Correspondence section of QST, to be published early in 2012.

2 Monitoring Scientific Studies

2.1 An international workshop was convened to examine the occurrence of tissue damage due to hyperthermia caused by radio frequency energy with results published in the International Journal of Hyperthermia. One of the key findings of the workshop and research papers was that while radiofrequency exposure standards can be further refined, present exposure limits set for the general public are more protective against thermal hazards than recommended limits for the temperature of hot water in the home. Experts at the workshop took issue with the concept that radiofrequency exposure standards are based on power absorbed in tissue rather than what they consider to be biologically important: the rise in temperature and its duration in tissue. However, most conclusions from the workshop were that the common RF exposure standards are adequately protective to maintain appropriate temperatures in tissues.

2.2 A study was published about former Israeli soldiers who presented with various forms of cancer and had been exposed to high levels of electromagnetic energy as part of their army service within the past ten years. The exposure levels were far in excess of safety standards and the study claimed to have found relatively short latency periods between the exposure and the onset of

cancer, many less than five years. However, the paper failed to demonstrate a clear statistical connection between exposure and the onset of cancer in the patients who were included in the study.

2.3 The committee discussed an article about people who claim to have "Electromagnetic Hypersensitivity" and have moved to the radio quiet zone in Green Bank, West Virginia, where several radio telescopes are located. EHS has been discussed by the Committee several times in past years. It is a condition that has neither been proven to exist or fully disproved. In some studies people who claimed to be afflicted with EHS were shown to be incapable of distinguishing between true and sham exposure of electromagnetic energy, suggesting that visible symptoms could be psychosomatic. However, other studies have supported the existence of reproducible symptoms in the presence of EM energy. In the current article people who moved to the radio quiet zone claimed to have found relief from their symptoms.

2.4 A paper was published that analyzed brain tumor results from several countries that participated in the Interphone study. This study is unique because it obtained the cellular telephone usage records for all of the subjects and allowed the investigators to make exposure estimates. The paper claimed to have found an increased risk of glioma brain tumors for long term (greater than 10 year) users of cell phones. There was no statistically significant increase in the incidence of any tumors when compare to the amount of cell phone use. However, the authors located a number of the subjects with brain tumors and asked them about their cell phone use, including their use of hands-free devices and which side of the head they used their cell phones. With this information combined with the usage data the authors estimated a Total Cumulative Specific Energy (TCSE) at the tumor center and then compared tumors with the most exposure (44) to those with the least exposure (509) and determined an increased Odds Ratio of 2.8 for the tumors in the most exposed area (OR of 1 means no chance of increase of getting the disease. In studies of this kind convincing values of OR are usually greater than 5. The average cigarette smoker has an OR of 9 for lung cancer). However, the small number of cases in the exposed area (44) compared with the large number of cases with less exposure (509) makes this result questionable. As well, the method of interviewing subjects about their cell phone usage up to 10 years earlier is likely to result in biased information.

2.5 Despite the vast majority of scientific evidence to the contrary, the City of San Francisco has decided that cell phones pose a cancer risk and have ordained that all cell phones sold in that city be labeled with a warning label.

2.6 Consumer Reports published an article suggesting that the published SAR limits for cell phones underestimate true energy absorption. The main source for this article was listed as the Environment Health Trust, a group that has consistently misrepresented science to further their agenda of decrying the danger of cell phones.

2.7 In the latest very large epidemiological study of cell phone users (358,000 subjects, 10,000 brain tumors), Danish researchers reported no difference in cancer rates between people who had used cell phones for ten years and those who did not use the technology. They also examined specific tumor types and the side of the head that the phone was used on and still found no association between cell phone use and any type of tumor.

2.8 An article was published suggesting that the Wi-Fi transmitters in laptops cause infertility in men by irradiating their sperm. The Committee discussed this study and found so much wrong with it that it is amazing that it was published in a scientific journal.

2.9 A report of another study on tumors suggested that electromagnetic energy can be used to slow their growth. This study used similar techniques to a study 20 years ago that suggested the opposite, implying that the techniques may be the source of the results rather than actual biological processes.

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. He generally shares the voting ballots for changes to the standards with the Committee prior to voting on them.

3.2 Dr. Lapin continues to testify about RF safety at zoning board hearings when cellular tower placement is being considered.

3.3 Dr. Lapin continues to serve as a member of the IEEE Committee on Man and Radiation, COMAR.

4 Administrative Issues

4.1 Members of the Committee continue to review articles submitted to QST, looking for potential RF safety issues that should be dealt with prior to publication.

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