

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

January 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 was asked by the VEC Question Pool Committee to develop the RF Safety questions for the new Extra Class exam. Several members of the committee submitted what they felt would be good questions that required an understanding of some of the finer details of RF exposure. Dr. Lapin worked with Perry Green, WY1O, to develop a set of 9 questions and then defend them to the rest of the QPC.
- 1.2 The committee commented on an exchange between Joel Halas, W1ZR, and a ham who was concerned about exposure during public service events in which a J-Pole antenna is used indoors with a 50-watt 2-meter transmitter and the nearest people at least 10-feet away from the antenna. Joel described the conditions that come into play when considering exposure and Dr. Siwiak performed a computer model of the situation to conclude that the uncontrolled MPE distance from that antenna would be about 6.5 feet.
- 1.3 The committee reviewed a paper submitted to QST regarding capacitive coupling of an antenna on board a ship through the glass of a port hole to an automatic tuner and radio in a stateroom. Dr. Gold related his experience with a similar antenna feed arrangement and cautioned that hazardous voltages can appear at the feed point. Dr. Siwiak performed a computer analysis of this arrangement and found corresponding high E-field strength around the port hole. The committee recommended that the article in QST be accompanied by a sidebar that includes these cautionary comments.
- 1.4 The committee discussed an antenna article that was printed on the ARRL Web Site. The antenna was an indoor dipole that was strung along the ceiling of the hallway outside the bedrooms of the house. A reader had questioned the RF safety of this setup and the RF Safety Committee was consulted. The committee concluded that this situation could be either safe or unsafe depending on the particulars of operation and the author should be consulted to specify under what conditions the antenna could be used safely. In addition, the committee crafted a few general paragraphs that were used as a sidebar to remind readers that such antennas have the potential to cause dangerous exposure and should be analyzed for the applicable operating conditions before use.
- 1.5 The committee was presented with another antenna article to review for RF safety. In light of the increasing number of nonstandard antenna articles being submitted to QST, the committee discussed some general procedures that should be followed by the QST

editorial staff when confronted with such a manuscript. The general consensus of the committee was that the author should include an RF Safety statement in the article, describing the conditions under which the antenna could be used safely. Mr. Hare dissented that this may be too complicated for many authors and may lead to a decrease in the number of articles submitted. He suggested that standard text to be appended to every antenna article be developed by the committee. The issue has not yet been resolved.

2 Monitoring Scientific Studies

- 2.1 Over the past year a worldwide problem with honey bee colonies, dubbed “Colony Collapse Disorder,” has been hotly debated in both the scientific and popular press. The problem that has been noticed in honey bee colonies is that bees leave the colony to perform their daily pollen gathering and never return. Radio frequency energy appeared to be implicated in this problem because of a shockingly unscientific “scientific study” performed by a university professor in Germany who placed a cell phone in a beehive and noted that the bees failed to return home. It was hypothesized that the RF energy disturbs the bees’ navigational abilities and they get lost when trying to return home. Fortunately cooler and more scientific heads have prevailed and a scientific group in Spain that has been analyzing this problem since 2000 initially ruled out pesticides and later RF as causes and recently implicated an influx of an Asian parasite, *nosema ceranae*.
- 2.2 A group of engineers at MIT was quoted in the popular press as having developed a new method to transfer energy wirelessly for the purpose of powering various mobile computing devices. The committee discussed the RF Safety implications of beaming relatively high powered electromagnetic waves across a room. Despite the authors’ claims of meeting the MPE requirements of the IEEE C95.1 standard, Dr. Guy noted that there was likely to be overexposure to a person in the room from the H-field components, which are often ignored in safety analyses. It was also noted that there are likely to be interference problems at 10 MHz with this technique. Dr. Siwiak performed a detailed analysis of the technique that confirmed these concerns.
- 2.3 The committee discussed a study showing changes in chemical pathways inside cells that are exposed to RF energy. When the popular press got hold of this study they made a big deal out of the presence of the observed athermal biological changes. This is not the first time that athermal biological effects to EM have been seen but none of these effects have been associated with changes in health. It was also noted that effects on cells in a dish are usually not reproducible when the same cells are located within the body. Despite the speculation of things that could happen, the committee noted that the epidemiological evidence during the exponential growth of cell phone usage worldwide does not show any increase in cancer.
- 2.4 An epidemiological study from England showed no increased association between disease and cell phone use for people who have used their phones for less than 10 years. The authors did not hesitate to remind the press that there still might be a risk for people who used their phones for more than 10 years, even though they had no evidence suggesting this.

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

4 Administrative Issues

- 4.1 Dr. Lapin met with Ed Mantiply in the FCC OET's RF Safety Office following the retirement of Dr. Robert Cleveland of that office. They discussed potential changes to the FCC's RF Safety rules that might come about due to differences in the IEEE C95.1-2006 revision of the standard.
- 4.2 The committee discussed the FCC's announcement that Bob Weller, N6NE, has been hired to work in the OET's RF Safety Office. Dr. Lapin related the results of his recent meeting with Ed Mantiply and the current and expected changes in the operation of that office.
- 4.3 The committee has identified a potential new member who has expertise with pacemakers to fill our need of responding to hams with pacemakers regarding the safety of their operating.

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