

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

July 2023

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

1. RF Safety Committee Activities.
2. Monitoring current events and scientific studies regarding RF Safety.
3. Participation in the scientific RF Safety community.
4. Administrative issues.

1 RF Safety Committee Activities

- 1.1 Dr. Lapin has written an entirely new RF Safety chapter for the 2023 edition of the ARRL Antenna Book. While the new Handbook material provides a basic explanation of the reasoning for and background of RF safety standards and regulations, the new Antenna Book material is directed toward the more technically oriented radio amateur. It concentrates on more exacting methods of analyzing exposure and antenna modifications that can be used to ameliorate high exposure scenarios. Antenna modeling examples of antennas that are commonly used and present potential exposure problems have been included.
- 1.2 The Committee submitted its final contributions to the FCC publication OET Bulletin 65 Supplement B, **Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, Additional Information for Amateur Radio Stations**. The new document is still undergoing the review process by various government entities as is the publication of the rewritten OET Bulletin 65.
- 1.3 Dr. Lapin published an article in the May 2023 edition of QST to remind amateurs that the FCC's 2-year transition period would end on May 3, 2023 and that all radio amateurs are now expected to perform exposure evaluations, or alternately perform the FCC's exemption analysis, for their stations. Following publication of this article, comments and questions were received from 23 radio amateurs, all of which were answered by Dr. Lapin. The majority of the questions were about using the ARRL Online Exposure Calculator with different antenna types. Even though many antenna that radio amateurs use do not have their specifications, such as antenna gain, reported by their manufacturers, it is possible to obtain an estimate for use in an exposure calculator. This may be a reasonable topic for a future QEX article.
- 1.4 The question of how the FCC is going to treat the exposure evaluation of handheld radios by radio amateurs got some clarification. Handheld radios are treated differently than fixed transmitters with respect to exposure since their antennas are typically less than 20 cm from the body. Under that condition the FCC requires SAR analysis, which is both complicated and expensive to either measure or model. The Committee was hoping that manufacturers would perform SAR testing on amateur HTs prior to their release, just as they do for commercial HTs and cellular telephones, and supply those results to radio amateurs. However, since the FCC does not require most equipment developed for amateur radio to be certified, so they could not compel this testing and the manufacturers chose not to do so. In an attempt to understand if an issue exists, Mr. Tell reviewed the FCC equipment authorization database for commercial radios similar to amateur HTs and found that they all had passed SAR testing without approaching the FCC mandated limits. He postulated that this could be used as evidence that exposure from amateur HTs similar to the commercial radios in the FCC database could also be assumed to be in compliance with FCC limits. Mr. Tell published this study (*Amateur Portable Radios (Handheld Transceivers): Exposure Considerations*

Based on SAR, QEX, July/August 2021, pp. 11-15). Communications with the engineers at the FCC have indicated that they are willing to accept this logic as evidence of compliance with the exposure regulations. However, they cautioned that this is not a blanket exemption from performing SAR analysis on handheld radios and there must be a strong similarity between the radio in the FCC equipment database and the amateur handheld radio in question. Wording to this effect has been included in section II.D of OET 65 Supplement B, which has yet to be released.

- 1.5 The Committee offered suggested corrections to the safety chapter of the ARRL General Class License Manual. In addition to RF Safety, comments were made about the explanations of electric shock safety, which appeared to be based on some old science that has since been revised.

2 Monitoring Current Events and Scientific Studies

- 2.1 An article in *Propublica* purported the dangers of cellular telephones. The article tried to appear well balanced but blindly relied on erroneous scientific reports, making RF technology seem to have a myriad of dangers. The dangers they reported were all based on scientific studies that have been determined to be too full of errors to be trusted. They also implied that the FCC was not keeping up with the science since their exposure limits were over 25 years old. The Committee determined that this article was so full of errors that responding to it would only prolong its influence.

3 Participation in the Scientific RF Safety Community

- 3.1 Dr. Lapin continues to serve as co-chair of IEEE ICES TC-95 Subcommittee SC-4: Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 3 kHz to 300 GHz. He attended the ICES conference in Chandler, AZ in January and virtually attended the ICES conference in Newbury, England in June.
- 3.2 Mr. Butcher continues to serve as the co-chair of IEEE ICES TC-95 Subcommittee SC-1: Techniques, Procedures, Instrumentation, and Computation. He attended the ICES conference in Chandler, AZ in January and attended the ICES conference in Newbury, England in June.
- 3.3 Mr. Tell continues to serve as the chairman of the IEEE ICES TC-95 Subcommittee SC-2: Terminology, Units of Measurement, and Hazard Communication. He virtually attended the ICES conference in Chandler, AZ in January and virtually attended the ICES conference in Newbury, England in June.
- 3.4 Dr. Bushberg continues to serve on the IEEE ICES TC-95 RF Safety Standards Committee.
- 3.5 Mr. Tell continues to serve as the chairman of the IEEE EMBS Committee on Man and Radiation, COMAR.
- 3.6 Dr. Bushberg continues to serve as the vice chairman of the IEEE EMBS Committee on Man and Radiation, COMAR.
- 3.7 Mr. Butcher continues to serve as a member of the IEEE EMBS Committee on Man and Radiation, COMAR.
- 3.8 Dr. Lapin continues to serve as a member of the IEEE EMBS Committee on Man and Radiation, COMAR.
- 3.9 Dr. Lapin and Mr. Tell continue to serve on the IEEE P.2725.1 Standard Committee, which sets the exposure limits for Microwave Medical Imaging Devices.
- 3.10 Mr. Butcher continues to serve as a member of the United States National Committee of the International Electrotechnical Commission (USNC/IEC) for TC106: Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure. He attended the TC106-Mt3 subcommittee meeting in Wroclaw, Poland, where the work centered on updating IEC

62669: Case studies supporting IEC 62232: Determination of RF Field strength power density and SAR in the vicinity of radiocommunication base stations for the purpose of evaluating human exposure.

- 3.11 Dr. Bushberg continues to serve as the chairman of the congressionally-chartered National Council on Radiation Protection, NCRP.
- 3.12 Dr. Small responded to a letter in his local newspaper that predicted imminent doom to us all from 5G exposure, blaming the FCC for being asleep at the switch on this issue.

4 Administrative Issues

- 4.1 The Committee bade farewell to Mr. Hare, who retired from ARRL and decided to limit his time working with the Committee. Mr. Hare has been an integral part of the RF Safety Committee from its creation in the mid-1990s and his help with Committee operations will be sorely missed. Mr. Hare will not continue as a member of the RF Safety Committee but has agreed to monitor the RFSC reflector and to offer his opinions on topics when he feels they are needed.
- 4.2 The Committee welcomes George Spatta, W1GKS, as its new staff liaison.
- 4.3 Dr. Siwiak is a contributing editor for QST and Editor of QEX. He shares submitted RF Safety-related articles with the Committee.
- 4.4 Dr. Lapin has participated in the ARRL Electromagnetic Compatibility Committee meetings. Complaints of interference to medical devices that are reported to the RF Safety Committee, are shared with the EMC Committee, whose expertise includes electromagnetic interactions with all types of instrumentation.

Respectfully submitted,

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Chair, ARRL RF Safety Committee

The ARRL RF Safety Committee

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