

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

July 2021

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 A subset of the Committee, that included Dr. Lapin, Dr. Siwiak, Mr. Tell and Mr. Butcher, has been meeting regularly with a group from the RSGB to discuss methods of conforming with RF exposure regulations. The RSGB approached the ARRL RFSC because their regulatory agency, Ofcom, will introduce RF exposure regulations for the first time to take effect between November 2021 and November 2022. We have shared our experiences in communicating the topic with our membership and are jointly developing tools for performing exposure analyses.
- 1.2 Dr. Kaune shared a collection of articles and letters to the editor of his local newspaper expressing concern about the profusion of RF in society. The Committee shared some ideas about how to respond to those concerns.
- 1.3 The Committee received a question from a ham about the safety of small HF loop antennas. Dr. Siwiak provided a detailed response, as he has researched and published about small loop antennas over the past several years. He pointed out that for such antennas the E-field does not require as large compliance distances as the B-field.
- 1.4 The Committee responded to Fred Hopengarten, K1VR, to help clarify what would be the legal ramifications of the changing FCC exposure rules. Over the past half year this became a moving target as the FCC issued new dates for the implementation of the rules and also various interpretations of what would have to change immediately, particularly with respect to handheld radios. Once the new rules went into effect on May 3, 2021, the Committee clarified what the responsibilities of radio amateurs would be in an article in the ARRL Letter.
- 1.5 A subset of the Committee, that included Dr. Lapin, Dr. Siwiak, Mr. Tell and Mr. Butcher, has met several times with engineers from the FCC Office of Engineering and Technology to discuss methods of conforming with RF exposure regulations. We have impressed on them some of the unique concerns of radio amateurs, including the inability of radio amateurs to perform SAR analyses and the importance of not requiring equipment used by amateur radio operators to go through the FCC certification process. The responses of the FCC have been favorable and we have worked together to meet those concerns.
- 1.6 The RFSC volunteered to help update the FCC publication OET 65 Supplement B, **Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, *Additional Information for Amateur Radio Stations***. The FCC approved an outline of a new document that represents a total revision of the previous version. A timeline of the end of the year was set to complete the document. The entire RF Safety Committee is taking part in rewriting

FCC publication OET 65 Supplement B. Various committee members have chosen sections from the outline to write and the entire committee will review the results. The next review with the FCC will take place in late July.

- 1.7 Dr. Lapin presented an explanation of the new FCC exposure regulations and what has changed from the previous regulations via Zoom to the ARRL Section Managers through RATPAC on April 21, the Martin County Amateur Radio Association on April 22, the Dayton Amateur Radio Association on May 7, and the Northern Illinois DX Association on June 11 . He has made his slides available to others who want to present the message to other ham clubs.
- 1.8 Mr. Tell presented a talk on the FCC exposure rules to the Huntsville Alabama Amateur Radio Club in preparation for Field Day.
- 1.9 Dr. Lapin was a guest on Ham Talk Live on May 13, along with Dan Brown, W1DAN, to discuss the changes to the FCC Exposure Regulations.
- 1.10 Mr. Hare generated a Frequently Asked Questions page for the ARRL website to help explain some of the changes that are taking place with the FCC exposure rules. The document is located at www.arrl.org/files/file/Technology/RFsafetyCommittee/RFXFAQ.pdf
- 1.11 Mr. Hare placed a far field RF exposure calculator on the ARRL website, at www.arrl.org/rf-exposure-calculator. The Committee reviewed the correctness of the results and the general operation of the calculator.
- 1.12 The Committee was invited to view a webinar put on by IEEE COMAR members Matt Butcher (also an RFSC member) and Jerry Bushberg. The title of the webinar was “RF Exposure in the Time of Conspiracies” and was intended to examine the reasons some people do not trust scientific evidence when it comes to the safety of electromagnetic energy.
- 1.13 Dr. Lapin presented an exposure analysis of the Field Day site of the University of Arizona Amateur Radio Club in Sonoita, Arizona on June 26.
- 1.14 The Committee has started to work on complete rewrites of the RF Safety sections of the 2022 editions of the ARRL Handbook and the ARRL Antenna Book.

2 Monitoring Current Events and Scientific Studies

- 2.1 In light of the potential FCC requirement that amateur handheld radios be tested for SAR, Mr. Tell researched the FCC equipment authorization database in an attempt to correlate commercial handheld radios with similar amateur handhelds. Mr. Tell’s hypothesis was that if the same manufacturers produce handheld radios for both the commercial and amateur radio markets, then the RF designs are likely to be identical between the two services’ devices. Since commercial handheld radios have been tested for SAR for many years, the database shows that the commercial version of a handheld radio tests below the FCC’s SAR thresholds and a similar amateur radio handheld just a few MHz away in frequency can be assumed to also produce exposure that is below the thresholds. Mr. Tell presented these data to the FCC Office of Engineering and Technology Laboratory personnel for their consideration and then published his findings in an article in the July-August 2021 issue of QEX under the title, “Amateur Portable Radios (Handheld Transceivers): Exposure Considerations Based on SAR.”
- 2.2 The Committee reviewed an article by the British Medical Journal relating the concerns stated by Professor John William Frank from the University of Edinburgh regarding the roll out of 5G cellular networks. The Committee agreed that Professor Frank demonstrated a lack of understanding of RF exposure, and particularly what research has been performed in the past and how the safety standards have been developed. His argument was that since 5G is new, it could be

dangerous due to the use of new frequency bands and a profusion of small cells. Those potential issues were addressed by safety standards committees long before 5G was designed.

3 Participation in the Scientific RF Safety Community

- 3.1 Mr. Tell continues to serve as the chairman of the ICES (IEEE) TC-95 Subcommittee SC-2: Terminology, Units of Measurement, and Hazard Communication.
- 3.2 Mr. Hare continues to serve on the ICES (IEEE) TC-95 RF Safety Standards Committee.
- 3.3 Dr. Lapin serves on the ICES (IEEE) TC-95 RF Safety Standards Committee.
- 3.4 Mr. Butcher continues to serve as the co-chair of ICES (IEEE) TC-95 Subcommittee SC-1: Techniques, Procedures, Instrumentation, and Computation.
- 3.5 Mr. Tell continues to serve as the chairman of the IEEE EMBS Committee on Man and Radiation, COMAR.
- 3.6 Dr. Lapin continues to serve as a member 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.

4 Administrative Issues

- 4.1 The Committee held its first Zoom meeting in January. The meeting served as an introduction to the changes proposed in the FCC rules and what would be required of the Committee in the coming year.
- 4.2 The Committee bade farewell to our Board Liaison of the previous two years, Art Zygielbaum, K0AIZ, with our thanks for his help. The Committee then welcomed our new Board Liaison, Dave Propper, K2DP, and is looking forward to working with him in this busy time.
- 4.3 Dr. Siwiak is a contributing editor for QST and Editor of QEX, and he shares any submitted RF Safety-related articles with the Committee.
- 4.4 The Committee welcomed a new member, Brian Daly, WB7OML. Mr. Daly is a long-time radio amateur with a long list of public safety activity. He works professionally as the Assistant Vice President for Standards and Industry Alliances at AT&T Labs in Atlanta, GA.
- 4.5 Dr. Griffen has asked, upon his retirement, that his involvement in the Committee be scaled back and that he be considered an Emeritus member of the RF Safety Committee. Dr. Griffen has provided valuable information and insight to the Committee for many years and the Committee is grateful for his expert assistance. Although we do not relish decreased contact with Dr. Griffen, we are pleased that he will continue to monitor the Committee activities and will occasionally join in our discussions. We wish him the best in his retirement.
- 4.6 The Committee is preparing a rework of the RF Safety Committee pages on the ARRL website. Committee member photos and biographical sketches are being updated and the pointers to tools related to exposure analysis are being made easier to find.

Gregory Lapin, Ph.D., P.E., N9GL
Chair, ARRL RF Safety Committee

The ARRL RF Safety Committee

Chair

Gregory D. Lapin, Ph.D., P.E., N9GL
1206 Somerset Ave
Deerfield, IL 60015-2819

Committee Members

Matt Butcher, P.E., KC3WD
213 N Evergreen St
Arlington, VA 22203-1225

Kai Siwiak, P.E., Ph.D., KE4PT
10988 NW 14th St
Coral Springs, FL 33071-8222

Brian K. Daly, M.S.E.E., WB7OML
3535 Peachtree Rd NE
Atlanta, GA 30326

Bruce Small, M.D., KM2L
10540 Stoneway
Clarence, NY 14031-2100

William T. Kaune, Ph.D., W7IEQ
160 Cedarview Dr
Port Townsend, WA 98368-9527

Richard A. Tell, M.S., K5UJU
10037 Long Meadow Rd
Madison, AL 35756-4247

James W. Ross, M.D., M.P.H., W4GHL
851 Kauska Way
The Villages, FL 32163-0082

Guy L. (Bud) Tribble, M.D., Ph.D., N6SN
63 Bovet Rd
San Mateo, CA 94402-3104

Emeritus Committee Members

Robert E. Gold, M.D., W0KIZ
9197 N. Clydesdale Rd
Castle Rock, CO 80104-9102

William Raskoff, M.D., K6SQL
1769 Escalante Way
Burlingame, CA 94010-5807

Gerald Griffin, M.D., K6MD
123 Forest Ave
Pacific Grove, CA 93950-2619

Liaison to the ARRL Board of Directors

David Propper, K2DP
747 Old Bonhomme Rd
University City, MO 63132-5031

ARRL HQ Staff Liaison

Ed Hare, W1RFI
ARRL Headquarters
225 Main St
Newington, CT 06111-1400

ARRL HQ Administrative Liaison

Kelly Wells
ARRL Headquarters
225 Main St
Newington, CT 06111-1400