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Accredited Standards Committee C63[®]

Electromagnetic Compatibility

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NEWSLETTER

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MESSAGE FROM THE CHAIR

Daniel D. Hoolihan, Chairman ANSI-ASC C63[®]

ANSI-ASC C63R on EMC – Series of Meetings at UL in Research Triangle Park, North Carolina.

The “C63 Committee” met the week of April 29 – May 3, 2019 at Underwriters Laboratories (UL) in Research Triangle Park, North Carolina. The first part of the week a number of working groups met; Wednesday and Thursday the eight subcommittees of the Main Committee met and the Main Committee Meeting was held on Friday, May 3rd.

The Working Group meetings were well attended with an average attendance of about 25 people. The WG meetings were heavily-oriented around wireless topics on Monday and more general topics on Tuesday.

Awards were given on Friday morning at the Main Committee meeting. The Awards were primarily for the publication of C63.25.1 and C63.5 – Corrigendum.

The C63.25.1 standard covered site validation techniques from 1 to 18 GHz including a new Time Domain Reflectometry technique. The C63.5 corrigendum was the first corrigendum in C63 history.

Our principal contact at UL was Bob DeLisi and he was an excellent host. The food and hospitality were both excellent.

See the pictures below for more details on the awards that were

given at the meeting.

The Main Committee meeting was well attended with approximately 90% of the members of the committee in attendance. Reporting by the Subcommittee chairs on their activities was a key part of the Main Committee meeting.

The Meeting concluded at approximately 1 pm in the afternoon.

The next meeting of the “C63 Committee” will be November 18-22, 2019 at Keysight Technologies in Santa Rosa, California. Nate Potts will be our host.

ANSI-ASC C63 AWARDS



Dan Sigouin (Chair), Greg Kiemel (Vice-Chair/Secretary), and Tim Harrington (Technical Editor), shown above, were awarded plaques for their work on developing C63.25.1 – 2018 in absentia by Dan Hoolihan, chair. Photo by Jerry Ramie



Don Heirman (above) and Zhong Chen (below) were awarded for their support in developing C63.25.1 at the main committee meeting by Dan Hoolihan, chair. Photos by Jerry Ramie.



Bob Delisi, above, was also recognized for his support in developing C63.25.1. Pictures of other contributors, Werner Schaefer, Khairul Zainal, and Dave Zimmerman are unavailable. Photo by Jerry Ramie.

ANSI-ASC C63R on EMC – Reply Comments on ET Docket No. 19-48

ET Docket No. 19-48 deals with the matter of: “Office of Engineering and Technology seeking comments on modifying the Equipment Authorization Rules to reflect the updated versions of the currently referenced ANSI C63.4 and ISO/IEC 17025 Standards.”

The “C63 Committee” filed Reply Comments on ET Docket No. 19-48 through its Pro Bono lawyers, Fish and Richardson. The comments were filed on 6/24/19.

The Reply Comments recommended the adoption of C63.4a-2017 by the FCC as well as the latest version of ISO/IEC 17025-2017. The Reply Comments also addressed comments filed by industry stake-holders during the 30-day filing period.

The FCC will review both the Comments and the Reply Comments that were filed and notify industry members, C63 Committee members, and other stakeholders of their decision.

Subcommittee 1

Techniques and Development

Zhong Chen (ETS-Lindgren), Chair.

Subcommittee 1 reapproved its scope membership and duties at the Main Committee meeting at Research Triangle Park in North Carolina in April 2019. The scope and duties will stay the same. The active working groups under SC1 include:

C63.2: Electromagnetic Interference and Field Strength Measuring Instrumentation in the Frequency Range 9 kHz to 40 GHz

C63.4: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

C63.5: American National Standard for Electromagnetic Compatibility--Radiated Emission Measurements in Electromagnetic Interference (EMI) Control--Calibration and Qualification of Antennas (9 kHz to 40 GHz)

C63.7: Guide for Construction of Test Sites for Performing Radiated Emission Measurements

C63.22: Guide for Automated Electromagnetic Interference Measurements

C63.23: American National Standard Guide for Electromagnetic Compatibility—Computations and Treatment of Measurement Uncertainty

C63.25.1: American National Standard: Draft Standard for Validation Methods for Radiated Emission Test Sites, 1 GHz to 18 GHz

Standards Activity

C63.2: The standard was published in 2016. The working group is currently not actively working on a new edition.

C63.4: The working group is working on the next release of the standard (with PINS approved in November 2017). At November 2016 working group meeting, three teams were formed for certain clauses:

- Team 1 (Clauses 1 to 5)—Don Heirman, leader
- Team 2 (Clauses 6 to 11)—Horia Popovici, leader
- Team 3 (Clauses 12 & annexes)—Tim Harrington

The working group also started by checking the use of the words “shall” and “should” for normative/informative clauses. At the working group meetings in April 2019 in Research Triangle Park, the working group held a meeting for three hours with 44 participants. The working group continues with an “aggressive” schedule and work.

- Teams held webinars approximately monthly for the past 2 years
- Early this year, a “master” document was combined which includes all clause work so that all teams saw the entire document in case changes also apply to other parts.
- Resolved the vast majority of major areas in standard
- Synching where we can with new edition of C63.5 and C63.25.1
- The document is estimated to be 98% completed

Key changes of C63.4 are summarized below:

- Clarified meaning of modal verbs (e.g., shall, should, can, may) and correction of their use
- Removed qualitative terms such as “small”, “large”, etc. to be sure that requirements are clear
- Addition of normative tolerances on dimensional specifications (1.4 and Annex C)
- Updates on LISN calibration requirements: addition of phase requirements and updated magnitude requirements for the LISN impedance and removal of the requirements to calibrate the LISN with extension cord, when used (4.3 and Annex B)
- Reformatted the antenna tables in 4.5.1 for better readability
- Updated normative references to their latest editions, including ANSI C63.5, C63.2, and all CISPR references (clause 2)
- Clarified use and placement of the vertical coupling plane for conducted emissions on tabletop, floor-

standing, and combination equipment (5.2.3, 6.4 and 7.3.1)

- Removed the site validation option consisting in placing absorbers on the ground plane. All test sites for radiated measurements above 1 GHz must now meet the site VSWR requirements up to 18 GHz (5.5), and **including C63.25.1 to allow Time domain approach.**
- Added clear requirements for EUT cable termination and cable type (6.2.4.2 and 6.2.4.3 [HP1])
- Addition of requirements for pole-mounted EUT (6.3.6)
- Updated requirements for EUT arrangement for radiated emissions to account for large systems, with multiple units. The EUT arrangement must be centered onto the turntable (6.3)
- Clarified how radiated emissions measurement distance is defined, including clear definition of the antenna reference point and boundary of the EUT. Addition of restrictions on possible measurement distances (minimum and maximum), for each frequency range (8.2)
- Updated test method for radiated emissions above 1 GHz to account for the antenna beam width relative to the EUT arrangement’s width and height (8.2.5). Addition of requirements for test EUT with HDMI input (12.2) and HDMI output (12.3).
- Replaced Annex D (NSA) by the new Annex D from ANSI C63.4a-2017, with small modifications, such as clarification of the antenna height-scan step size, and addition of website link to utility spreadsheet for calculating theoretical NSA values for an ideal site (Annex D).
- Updated guidelines on radiated emissions maximization procedures to support reduced test time (Annex E)

C63.5: Working group is actively working on the next edition of C63.5. The goal is to get a draft document ready for working group review by the end of November, 2019.

- Defining requirements for sites
- Time gating clarification, Annex K
- Loops
- General edits
- Document cleaning

C63.5 Working Group is also piloting a work space website from iMeet Central (provided by IEEE) to manage work product and files.

C63.25.1: The C63.25.1 was officially published in March

2019. C63.25.1 standard is the first document for an intended family of C63.25 standards. The family of C63.25 standards include:

- C63.25.1 (1 GHz to 18 GHz) Site VSWR (SVSWR)/Time Domain Site VSWR (TD SVSWR)
- C63.25.2 (30 MHz to 1 GHz) Standalone site validation document for 30 MHz to 1 GHz, namely Normalized site attenuation, which is currently part of C63.4 standards.
- Future plan for < 30 MHz and > 18 GHz

A study group (C63 Committee PINS-C) is proposed to study testing and calibration requirements to frequencies above 18 GHz. The goal of the study is to provide guidance for future standards development extending beyond 18 GHz (at least 40 GHz). Some of the topics may include

- Extending current TD VSWR methods in C63.25.1 to above 18 GHz
- Examination of antenna pattern influences on the site validation
- Examination of other possible alternatives (free space VSWR, dipole and loops)
- How to evaluate accessories in the test environment (towers, tables, other structures)
- Considerations for antenna calibration sites



Subcommittee 1 meeting – Zhong Chen-ETS-Lindgren on the left and Janet O’Neil in the foreground. Don Heirman and Dan Hoolihan are in the background. Photo by Jerry Ramie.

Subcommittee 2 Definitions

Marcus Shellman, Chair.

ANSI C63 SC2 held its committee meeting on 01 May 2019. Working Group 1 is currently preparing ASC C63.14 for balloting with publication anticipated by first quarter CY2020. SC2 Working Group 2 is conducting monthly

webinars and making good progress in developing ASC C63.28. Publication of the document is expected by the end of CY2020.

Subcommittee 3

International Harmonization

**Don Heirman (Don Heirman Consultants),
Chair**

The November 2018, Feb 14 2019 and May 2019 SC/3 meetings were very busy reviewing the status of the C63 standards and those being prepared. This is done at all its meetings to determine which of the topics are candidates for consideration internationally or may exist in part in international standards. The goal is to reduce duplication and yet foster the introduction of material from C63 standards into IEC EMC standards. In addition, the committee may see that text from the near equivalent international standard may improve the subject C63 standards. The major committees considered in these comparisons are those of the International Special Committee on Radio Interference (CISPR) and technical committee TC 77 on EMC, both part of the International Electrotechnical Commission (IEC).

Next, the committee delved into the comparisons and discussed possible contributions to the IEC work and in reverse where some of the material in the IEC committee can be referenced in the C63 work with proper copyright release and attribution.

There is much work to proceed to the point of truly complete comparisons. To summarize, the meeting corrected the international standards citing to be where the C63 standards material is near equivalent. It updated the responsible persons for the comparisons and set up a reminder scheme to give deadlines for submitting the comparison reports which are captured in a template. A copy of this template can be requested by the subcommittee chair.

To conclude, the subcommittee continued to agree on meeting four times each year. The face-to-face meetings are roughly 6 months apart. In between the face to face meetings there is a webinar meeting. All the meetings have webinar access. Those wishing to listen in should contact the secretary on jramie@arctechical.com

The next SC meeting is a webinar on **28 August (2:00 pm to 4:00 pm EDT).**



Photo by Jerry Ramie.

Subcommittee 4 Wireless and ISM Equipment Measurements

Bob DeLisi (UL), Chair



Subcommittee 4 meeting – Reapproving the SC4 scope, membership and duties. Photo by Jerry Ramie.

Subcommittee 4 (SC4) reapproved its scope, membership and duties at the Main Committee meeting. Membership and scope can be found on the C63.org website. SC4 duties include:

- C63.10: American National Standard for Testing Unlicensed Wireless Devices
- C63.26: American National Standard of procedures for compliance testing of transmitters used in licensed radio services
- C63.29: draft: American National Standard of procedures for compliance testing of lighting products
- C63.30: draft: American National Standard of procedures for compliance testing of Wireless Power Transfer products
- C63.31: draft: American National Standard for compliance testing of Industrial, Scientific and

Medical (ISM) Equipment

Standards Activity

C63.10: The working group, chaired by Jason Nixon, reviewed comments which were the result of the Subcommittee 4 (SC4) ballot of draft C63.10. There were 20 comments received of which 6 were technical in nature. All comments were resolved by the working group. As a result of resolution of one of the comments, a concern was raised with the current text in C63.10 that requires testing at 100% duty cycle, when the system duty cycle is less. The working group provided updated text to clarify when a reduced duty cycle would be accepted and the draft was updated in the appropriate places. The draft will be recirculated to SC4 to confirm changes are acceptable. Once approved, the document will be sent to the main committee for vote and formation of a balloting group.

The working group also discussed if the standard, as it is currently drafted, covers the necessary procedures for testing 802.11ax technology based on recent FCC measurement guidance. It was determined that the standard is sufficient for now as 802.11ax is not completely mature and that further guidance would be for the next revision or an amendment to C63.10.

C63.26: The working group, chaired by Steve Jones, continues to improve the current draft of the standard. In particular, the mmWave JTG (Joint Task Group) gave a presentation on the progress of mmWave (28 GHz) EIRP, TRP, and Conducted Power measurement procedures. The JTG is nearly complete with this work and the proposed procedures will be integrated into draft revised standard before next face-to-face meeting (F2F). It is important to note that the FCC has adopted the draft text to issue KDB guidance until the next edition of C63.26 is published.

The 76-81 GHz Vehicular Radar Task Group (TG) gave a presentation on Vehicular Radar (FMCW and Pulsed) Draft Measurement Procedures. The TG work nearing completion and the procedures will be integrated into revised C63.26 Standard before next F2F. Like the mmWave procedures, the FCC will likely turn this work into a KDB prior to the standard being published.

The Multi-beam (MIMO) mmWave EIRP Measurements TG gave a presentation on the draft procedures for summing EIRP over multiple antenna beams and empirical method for determining actual radiated far-field distance. The work is complete and the text is currently being integrated into the draft standard.

The Signal Booster TG gave a brief status report which identified some new work items which need to be discussed and addressed. The TG will be addressing these items over the next few months. Once the work is complete it will be incorporated into the draft standard.

The goal of the C63.26 Working Group is to submit a draft to SC4 shortly after next face-to-face in November 2019.

C63.29: The working group, chaired by Ernesto Mendosa, continues to make progress on the draft standard. The working group continues to discuss how dimmers are to be operating during testing. There are two proposed methods being discussed which are with the triac enabled and with the triac not enabled. In addition to the triac issue, the WG also is discussing tolerances on input power to the device under test. It has been suggested that in order to properly control the EUTs voltage a tolerance of 2% is needed rather than the originally suggested 5%. The WG decided that the draft standard will be referencing relevant C63.4 material to not duplicate information in the draft and keep the draft focused on methods of measurement for lighting devices. The WG expects to be completed by September 2019 (stretch goal) or by Q1 2020 (long term goal)

C63.30: The working group, chaired by Travis Thul, discussed radiated emissions EUT arrangement and methods. A short presentation on discussions related to the "SAE" method vs. "traditional" method and the proposed resolution to where differences exist. The "SAE" method uses a fixed radius boundary with the light duty vehicle coil centered on the turntable. The traditional method uses the smallest boundary circle around the system and the system is centered on the turntable. It was discussed that the "SAE" method application will be restricted only for passenger vehicles, not mopeds / lawn mowers, nor larger vehicles (bus). There was a proposal for modification or restriction in the requirement to apply a margin to each emission when the circle was used instead of the periphery.

The goal is to have a draft to SC4 in 2019 but this is contingent on the study of work that is currently ongoing for measurements below 30MHz. This work is comparing testing results taken with a Large Loop Antenna System and a traditional 60 cm loop. In addition, the comparison will include a study between tests with and without a ground reference plane. This work is ongoing by participating laboratories.

C63.31: The working group, chaired by Derek Walton, discussed the basic ISM test methodology and presented the first complete draft of the new standard. The working group

discussed and began the process of resolving outstanding issues. In addition, the working group will be studying and defining a test methodology for where In Situ testing may be necessary, i.e., at the end location, or at the manufacturer's site. The working group will also look to ensure, where appropriate, there is commonality with other ANSI Standards since the group has identified that there is an ongoing challenge to ensure commonality with other standards as they change (e.g. using portions of drafted C63 standards such as C63.4)

The goal is to have a draft to SC4 at the end 2019. The other will happen in SC4. The subcommittee will be forming a task group to explore the idea if it should make a proposal to remove use of the quasi-peak adapter for unlicensed wireless device measurements and move towards making measurements with an average detector with a limitation on peak emissions. The first task is to make some measurements utilizing a vector signal generator to simulate different modulations and/or waveforms to study the impact of the proposed change. Additional testing on some products will also be made by AARL for this study. The group will need to also consider how many products would become non-compliant and what is the impact within FCC and ISED Canada rules. The data will be reviewed at the next Face-to-Face to determine what next steps are to be (recommendations to FCC and ISED Canada, determine further study if needed, etc.).

Next Meeting: Week of Nov. 18 in Santa Rosa, CA. Nate Potts of Keysight is hosting our meeting. Mark Terrien is co-hosting.

Subcommittee 5 Immunity Testing **Ed Hare (ARRL), Chair**

5.1 Updates: Mr. Graff suggested "commercial environment" instead of "office" be used for the wording. Mr. Hare felt we should stay with laboratory testing driven by the field strengths encountered in commercial environments. In-situ measurements could be taken up in C63.24. Don noted that he has asked Jeff Evans to become the Chair, subject to the approval of SC5. Don moved, (no second required) to name Jeff Evans of Intel as the new C63.9 Chair. Discussion ensued. The motion carried unanimously. Mr. Hare appointed Mr. Evans as the Chair of the C63.9. Mr. Heirman indicated that he is willing to serve as the Vice Chair if appointed by the new Chair of the Working Group.

AI-68: Jerry is to modify the C63.9 entry in status matrix as shown for PINS modifications.

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Subcommittee 6 Laboratory

Accreditation/ Conformity Assessment

Randy Long (ANSI-ASQ National Accreditation Board, dba L-A-B), Chair



Working Group 4 of Subcommittee 6 is nearing completion of ANSI C63.8 to provide organizations with guidance to effectively communicate technical requirements to both purchasing staff and selected service providers to ensure the appropriate product or services are received. A number of examples are in development to effectively convey technical requirements to purchasing staff in order to ensure purchased services or equipment are fit for use or appropriately tested or calibrated meeting their Accreditation/Conformity Assessment obligations. The draft Guide for Guidance on specifying requirements for the calibration and verification of EMC test equipment is being reworked by the subcommittee at this time. Updating and revising of verbiage have been the foci of their work.

Measurement of the Electromagnetic and Operational Compatibility of Unlicensed Personal Communications Services (UPCS) Devices

C63.27 – American National Standard for Evaluation of Wireless Coexistence

C63.27 is currently under revision. Suggestions to improve Annex A by incorporating the following are under consideration:

--Emphasize the iterative test philosophy of C63.27 in the overview section.

--Harmonize the summary of each section with the specifications provided in the corresponding subsections.

--Clarify channel utilization of unintended signals.

--Expand scope to cover LTE-LAA EUTs and unintended signals.

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Subcommittee 8

Medical Equipment Testing

Stephen Berger (TEM Consulting, LP), Chair

Subcommittee 8 focused on ANSI C63.19 – 2019 – Revision 2-8.

After four circulations at the formal balloting level, the latest version of this standard was approved with a 79% approval of the entire ballot body and 93% approval of returned votes, excluding abstentions.

The balloted standard is the Fifth Revision of this important standard that has served as the effective agreement between the cellular and hearing aid industries addressing the needs of hearing aid users.

The balloted standard is moving forward in the formal ANSI approval and publication (by IEEE) process.

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Subcommittee 7 Spectrum Etiquette

Vladimir Bazhanov (Ericsson), Chair

Subcommittee 7 develops standards addressing spectrum etiquettes, wireless coexistence and related standards to provide new or amended measurement techniques, protocols or methods and associated instrumentation and operational constraints supporting more efficient spectrum utilization, including dynamic spectrum access. This was approved by the subcommittee on May 2nd, 2019. Subcommittee 7's duties are:

C63.17 – American National Standard for Methods of

Member Updates

The ANSI-C63 lost a committed member in Dheena Moongilan of Laird Technologies. He died of complications from a heart attack suddenly in June and his input will be missed.



Dheena Moongilan Photo provided by of Andy Griffin of Cisco.

Art Wall is enjoying his retirement from the C63 committee with his wife, Hannah.



Photo provided by Art Wall.

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Any questions about the Newsletter should be addressed to: Bridget Hoolihan, Editor (bhoolihan@gmail.com)

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