

**APPROVED MINUTES - ANSI ASC C63® SC1: Techniques and Development
Keysight Technologies – Santa Rosa, California - Wednesday, November 20, 2019**

Members Present:

Mike Antola (via WebEx)
Mark Arthurs
David Chamberlain
Zhong Chen (Chair)
Bob DeLisi
Mac Elliott (via WebEx)
Andy Griffin
Tim Harrington (via WebEx)
Don Heirman (via WebEx)
Harry Hodes (Vice-Chair)
Dan Hoolihan
Steve Jones
Greg Kiemel
Jeff Klinger (via WebEx)
Doug Kramer
Victor Kuczynski
Randy Long
Jason Nixon
Michael O'Dwyer
Janet O'Neil (Secretary)
Nate Potts
Mits Samoto (via WebEx)
David Schaefer
Jeff Silberberg
Dennis Ward
Khairul A. Zainal
David Zimmerman (via WebEx)

Members Absent:

Rick Lombardi
Dan Sigouin

Guests:

Wally Arcenaux
Henry Benitez
Ross Carlton
J. C. Chen
Jeremy Cline
Jason Coder
Jeff Evans
Bruce Fagley
Ken Gjerde
Bill Graff
Ed Hare
Ross Luan
Nima Molaei
John Norgard
Jerry Ramie
John Repella
Mark Terrien
Pao Thao
Deanna Zakharia

Employer:

Residio
Sony
ISED Canada
ETS-Lindgren
Underwriters Laboratories Inc. (UL)
TUV Sud America
Cisco
FCC
Don HEIRMAN Consultants
Bay Area Compliance Labs
Hoolihan EMC Consulting
FCC
Element Materials Technology
Compatible Electronics
ETS-Lindgren
Vican Electronics
ANAB
ISED Canada
Apple
ETS-Lindgren
Keysight
Liberty Labs Asia
Element Materials Technology
FDA Center for Devices & Radiological Health
PCTEST
Laird Connectivity
Spectrum EMC Consulting, LLC

Employer:

Visteon
DHS

Employer:

Rohde & Schwarz
ElectroMagnetic Investigations
ETS-Lindgren
Apple
Rohde & Schwarz
NIST
Intel
TUV Rheinland
Starkey
TUV Rheinland
ARRL
ANAB
PCTEST
NASA/JSC
ARC Technical Resources
Washington Labs
Keysight
Starkey
Motorola Solutions

1.0 Call to Order: Chair

Chair Zhong Chen called the meeting to order at 10:15 am. A round of introductions was made.

2.0 Approval of the Meeting Agenda and SC1 Scope: Chair

Zhong Chen presented the draft agenda for the November 20, 2019 meeting for review. The agenda item 4 on "Election of Officers" was moved to later in the meeting. **Bob DeLisi moved to approve the agenda as amended. The motion was seconded and approved.** (See Attachment A for the approved agenda.)

3.0 Presentation of [patent slides](#): Chair

Zhong Chen gave a presentation to review the status of the meeting fees, the ANSI policy related to Intellectual Property (IP), inappropriate topics for IEEE Working Group meetings and the Working Group meeting slide template. (See Attachment B.) **Mr. Chen moved to confirm everyone present agreed to abide by the procedures outlined in the patent slides. The motion was seconded. All confirmed compliance.**

4.0 Approval of Minutes of Previous Meeting: Secretary

Secretary Janet O'Neil presented the minutes of the May 2, 2019 meeting held at UL in Research Triangle Park, NC. **Jeff Silberberg moved to approve the May 2, 2019 minutes as presented. The motion was seconded and approved.** (See Attachment C.)

5.0 Review of [Subcommittee Membership](#): Secretary

5.1 Review of membership – Members at risk. Secretary Janet O'Neil advised that Werner Schaefer's membership is at risk since he has missed four consecutive meetings. He was contacted and advised he would attend the meeting in November in Santa Rosa; however, he is not present and will be removed from membership.

See the Member Attendance Log included in Attachment A for the updated membership tracking record. See Attachment D for the updated SC1 membership roster.

5.2 Consideration of New Members – Working Group Rosters

A new membership application for SC 1 was received from David Chamberlain in mid-May 2019. His application was approved by SC 1. Secretary O'Neil circulated the SC 1 membership application and resume of Nicholas Abbondante to SC 1 members on November 19, 2019. **It was moved and seconded to approve the membership application of Nicholas Abbondante.** She then reviewed the roster of Working Group members as shown on the C63 website. An application was received from Yufei Xiong to join the C63.5 Working Group. As a result of the recent vote within SC 1, his request to join the C63.5 Working Group passed. (See Attachment E for the updated roster of SC1 Working Groups.)

ACTION ITEM: All Working Group Chairs need to complete their rosters and indicate their officers (Vice-Chair and Secretary) and submit to SC1 Chair prior to the next meeting.

6.0 Working Group Reports

C63.2: Field Strength Measuring Instrumentation – C63 Chair Dan Hoolihan requested SC1 Chair Zhong Chen to add a cover page to this standard and plan for a new document in 2021. Mark Terrien of Keysight will assist with this effort. He will create a PINS and work with Zhong Chen.

ACTION ITEM: Mark Terrien to create a PINS for C63.2.

C63.4: Emissions Measurements

Working Group Chair: Don Heirman

Status: C63.4: Current-2014. New PINS approved by WG, SC1 and C63 in Nov. 2017

Don Heirman presented his report. (See Attachment F.) The Working Group met on Monday, November 18, 2020. They reviewed recent activity to prepare the report for SC 1. They scheduled their next webinar to go over SC1 ballot comments (if any) and MEC comments (if received) on December 12, 2020. The Working Group is expecting C63 to start ballot formation after December 12 and go to ballot early in 2020. Publication is anticipated in the first quarter 2020.

As a bit of background, at the November 2016 WG meeting, three teams were formed for amending certain clauses in C63.4-2014:

- Team 1 (Clauses 1 to 5) - Heirman leader
- Team 2 (Clauses 6 to 11) - Popovici leader
- Team 3 (Clauses 12 and annexes) - Harrington leader

The Working Group reviewed the standard to make sure that “shall” applied to requirements and that “should” is only used for informative statements. This clarified the normative and informative aspects of the standard in all clauses in the standard now and being amended.

Key changes to the document include:

- 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
- Added normative tolerances on dimensional specifications (1.4 and Annex C)
- Updated 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 the extension cord, when used (4.3 and Annex B)
- Reformatted the antenna tables (4.5.1)
- 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 of placing absorbers on the ground plane. All test sites for radiated measurements above 1 GHz must now meet the SVSWR requirements up to 18 GHz (5.5) - including C63.25.1 to allow the Time Domain approach
- Added clear requirements for EUT cable termination and cable type (6.2.4.2 and 6.2.4.3)
- Added 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 the radiated emissions measurement distance is defined, including clear definition of the antenna reference point and boundary of the EUT. Added 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]
- Added requirements for testing 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)

Regarding the approval process, the document was sent to SC1 for initial review of the mature draft in October. Some 100 comments were received. The Working Group held webinars held on October 2, 17, and 31 to resolve the comments. Don Heirman presented SC1 with a motion to move the draft document to C63 for balloting. This was sent to SC1 members on November 14. Discussion is slated to end on November 29 with a vote to immediately follow. Concurrently, the document was sent to IEEE MEC for review on November 14.

The Working Group will resolve any comments with SC1 vote during the first week in December. A revised draft will be generated if there are comments agreed to by the Working Group during its webinar on December 12. The plan is to send the mature draft to C63 for balloting by third week in December with a vote to be taken by C63 in early January 2020. Publication would then take place in the first quarter of 2020.

ACTION ITEM: Don Heirman to review and resolve any comments generated by the November 14 distribution to SC 1 of the current draft of C63.4.

C63.5: Antenna Calibration

Working Group Chair: Doug Kramer

Status: Current-2017.

Doug Kramer presented his report. (See Attachment G.) The Working Group provided input on the use of dated references: C63.5 supports the use of dated references within C63 standards, except when not appropriate. (It is appropriate when referencing any standards outside the direct control of the C63 committee.) Transition periods are the responsibility of persons or documents using C63.5.

Doug noted the title of this standard should be modified to remove the frequency range of 9 KHz – 40 GHz. **Doug Kramer moved to revise the standard's title to "ANSI C63.5 Radiated Emission Measurements in Electromagnetic Interference (EMI) Control - Calibration and Qualification of Antennas." The motion was seconded and approved.**

Moving forward, the Working Group will work on the next edition and review the major edits. The goal is voting in the Working Group before the next face-to-face C63 meeting series.

Andy Griffin noted he would like to see a clarification on the ANSI C63 antenna calibration standard versus the CISPR antenna calibration standard in the next edition.

ACTION ITEM: Bob Delisi/Nate Potts/Doug Kramer to create an informative annex for C63.5 to address/summarize Andy Griffin's comments. Nate to compile the information from the SC3 content he has provided to Don Heirman for C63.4.

Doug closed his report in noting that the Working Group uses iMeet Central Workspace (at <https://ieeesc.imeetcentral.com/c635/>) to manage work product and files. Meetings are held via WebEx with a focus on contributions and debate of submitted data. Files are stored on iMeet; the Working Group no longer shares information via email.

C63.22-2004: Guide for Automated EMI Measurements

This standard is active, but it has not been revised or reaffirmed since 2004. The listing is shown here from the IEEE SA website: https://standards.ieee.org/standard/C63_22-2004.html The standard should be reviewed or withdrawn as it is now 15 years since original publication.

ACTION ITEM: Don Heirman to check with Jennifer Santulli of IEEE to confirm the status of this document.

C63.23-2012: Guide for Computations and Treatment of Measurement Uncertainty

Working Group Chair: Jason Nixon

Zhong Chen advised that he has not been able to find a person to chair this Working Group. He has approached several people. Harry volunteered to address the latest PINS on this (written by Jason Nixon). Don Heirman volunteered to collect comments on changes need to this document and to work with Zhong to see if they can find someone to chair this Working Group.

ACTION ITEM: Harry Hodes to report on the latest PINS on C63.22.

ACTION ITEM: Don Heirman to collect comments on changes needed to this document and to help Zhong find a chair for this Working Group.

C63.25: Time Domain Applications for Test Site Validation

Working Group Chair: Dan Sigouin

Status: New Standard. Draft being written. PINS approved by SC1 on October 27, 2014

Greg Kiemel reported on C63.25 in the absence of Dan Sigouin. (See Attachment H.) The Working Group held a meeting on Tuesday, Nov 20, 2019 at Keysight Technologies in Santa Rosa, CA. Twenty-three people attended.

This work addresses the family of C63.25 standards:

- C63.25.1 (1 GHz to 18 GHz) TDR - Published December 2018
- C63.25.2 (30 MHz to 1000 MHz) "NSA" - Work on C63.25.2 began January 2019; PINS is current
- C63.25.3 (>18 GHz)
- C63.25.4 (<30 MHz)
- C63.25.2 (30 MHz to 1000 MHz) PINS is current
- C63.25.1 published in March 2019 (C63.25.1-2018)

During the Working Group meeting, Zhong Chen discussed his proposal for a simplified site validation method for 30 MHz – 1 GHz. There were conflicting opinions on whether the antenna calibration method and the site validation method should reside in C63.25.2 - or just the site validation method. Currently the antenna calibration method for this method has been submitted to the C63.5 Working

Group for possible inclusion in their draft standard. Relevant information regarding normalized site attenuation will be ported over from ANSI C63.4a – 2017.

Moving forward, the Working Group agreed to the following:

- Decision to not work (at this time) on NSA for free space test sites, e.g. FAR.
- Need to define test methodology when two antenna masts are used simultaneously. In some cases there is an interaction between the antennas that impacts site validation results.
- Goal set to submit a draft to SC1 by December 2020.
- Next teleconference targeted for January 2020.

Zhong noted that on C63.25.3, not many people are concerned about measurements above 18 GHz so the focus of the Working Group will be on C63.25.2 moving forward. Zhong expects C63.23.3 to get active in the future.

Bob DeLisi noted that neither the FCC nor Canada have issued support of C63.25.1 which means the standard has no value to industry. Dan Hoolihan volunteered to address this at the steering committee level.

ACTION ITEM: Dan Hoolihan to address FCC and Canada (ISED) lack of support for C63.25.1 at the parent committee level.

7.0 Old Business – Chair – Election of Officers

Zhong Chen advised his term as Chair of SC1 would end on December 31, 2019. **Dan Hoolihan moved to waive the term limits for the Chair of SC 1. The motion was seconded and approved.** The following members abstained from voting: A. Griffin, D. Heirman, H. Hodes, D. Kramer, R. Long, D. Ward, and D. Zimmerman.

Dan Hoolihan moved to appoint Zhong Chen as Chair of SC 1 for the term 2020-2022. The motion was approved by acclamation.

Dan Hoolihan moved to reinstate term limits for ANSI Subcommittee officers. The motion was seconded and approved. D. Zimmerman abstained from voting.

8.0 New Business – Chair

8.1 Coordination with SC3 for Harmonization – Don Heirman

Don Heirman noted RA-2 and RA-3 were taken over by Horia Popovici. Harry Hodes noted he would be the formal SC 1 representative to SC3 to address this. SC 1 was advised that before any Working Group draft may be submitted to the SC1 for approval, the document must be provided to the SC3 Chair for evaluation and coordination of any harmonization effort. See the table below for the activity status updated during the meeting:

Reviewer Actions

RA #	Task	Responsible party	Due Date	Status
RA-1	Compare C63.2 to CISPR 16-1-1	Harry Hodes	2/1/20	Closed per Harry Hodes
RA-2	Compare C63.4 to CISPR 16-2-X	Horia Popovici	2/1/20	Open
RA-3	Compare C63.4 to CISPR 16-1-4	Horia Popovici	2/1/20	Open
RA-5	Compare C63.5 to CISPR 16-1-6	Nate Potts	2/1/20	Open
RA-6	Compare C63.5 to SAE ARP 958 Rev D	Doug Kramer	5/1/19	Closed
RA-7	Compare C63.5 to CISPR 16-1-4	Doug Kramer	5/1/19	Closed
RA-14	Compare C63.23 to CISPR 16-4-2	Bob DeLisi	5/1/19	Closed
RA-17	Compare C63.25 to CISPR 16-1-4 (two freq. ranges under C63.25.1 and C63.25.2)	Doug Kramer	5/1/19	Open

ACTION ITEM: Don Heirman to contact Horia for data to close RA-2 and RA-3.

ACTION ITEM: SC1 Members to contact Doug Kramer if they have comments on the CISPR document comparisons to the ANSI C63 equivalent standards.

9.0 Review of Interpretation Requests: Zhong Chen reviewed the following open interpretation request since the last meeting on May 2, 2019. Note Interpretation Requests have been suspended by the parent committee; however, it was requested this request below remain on the agenda for now.

- **C63.4 (2014) “D3 NSA Vertical 3 Meters”** from Charles Wang, request dated 8-29-17. Subgroup members confirmed at the meeting included Don Heirman (chair) and Khairul Zainal. No update was provided. **ACTION ITEM: Don Heirman to follow up on this with Khairul Zainal.**

[Click here for more information about interpretation request procedures](#) (see pages 12-14).

Dan Hoolihan reminded the committee that responses to interpretation requests are informative, NOT normative, in nature.

10.0 [C63.org](#) Website Use and Updates

Jerry Ramie requested members be specific with any requests for postings to the website. He asked members to be sure to update or confirm they are correctly listed on the website.

11.0 Review of the Action Items from Previous Meetings: Secretary

Secretary O’Neil advised that an updated action item list would be distributed to the SC1 members along with the draft minutes from this meeting.

ACTION ITEM: O’Neil to distribute the updated consolidated action items and draft minutes from the November 20, 2019 meeting to the committee.

12.0 Time and Place of Next Meeting: Chair

Zhong Chen noted the next series of C63[®] meetings would be held over May 4-8, 2020 at ETS-Lindgren in Cedar Park, Texas. The SC1 meeting will be held on Wednesday, May 6, 2020.

13.0 Closing Remarks and Adjournment: Chair

With no further business, Zhong Chen adjourned the meeting at 12:30 pm. He thanked everyone for attending the meeting.

Minutes submitted by:



Janet O'Neil
Secretary, SC1

ATTACHMENTS

- Attachment A: Approved Agenda for November 20, 2019 SC1 Meeting
- Attachment B: Patent Slides Required Meeting Template Slides for ASC C63[®], IP Info
- Attachment C: Approved Minutes from May 2, 2019 SC1 Meeting
- Attachment D: SC1 Membership Roster
- Attachment E: SC1 Working Group Roster
- Attachment F: Heirman Report on C63.4
- Attachment G: Kramer Report on C63.5
- Attachment H: Sigouin Report on C63.25 standards series