

APPROVED MINUTES

ANSC C63® SC1: Techniques and Development Webex Meeting and In-Person Meeting Thursday, May 11, 2023 A2LA Frederick, MD

Members Present:

Nicholas Abbondante
Mike Antola
Mark Arthurs
David Chamberlain
Zhong Chen (Chair)
Bob DeLisi
Mac Elliott
Andy Griffin
Tim Harrington
Mike Heckrotte
Dan Hoolihan
Steve Jones
Greg Kiemel
Jeff Klinger
Doug Kramer
Victor Kuczynski
Randy Long
Jason Nixon (Vice Chair)
Janet O'Neil (Secretary)
Nate Potts
David Schaefer
Jeff Silberberg (via Webex)
David Zimmerman (via Webex)

Members Absent:

Nima Molaei
Tim Royer
Dan Sigouin

Guests:

Alain Abou-Zeid
Wally Arceneaux
Henry Benitez
Richard Bowman
Aurelian Bria
Bill Graff
Megan McConnell
Jack McFadden

Employer:

Intertek
UL LLC
Sony
ISED Canada
ETS-Lindgren
UL LLC
TUV Sud America
Cisco
FCC
UL LLC
Hoolihan EMC Consulting
FCC
Apple
Cetecom
Apple
Vican Electronics
ANAB
ISED Canada
ETS-Lindgren
Keysight Technologies
Element Materials Technology
FDA Center for Devices & Radiological Health
Spectrum EMC, LLC

Employer:

Element Materials Technology
Timco
Timco

Employer:

ISED Canada
Rohde & Schwarz
IEEE EMC Society
Intel
Ericsson
TUV Rheinland
A2LA
ETS-Lindgren

1.0 Call to Order: Chair

Chair Zhong Chen called the meeting to order at 3:00 pm EDT.

2.0 Approval of the Consent Agenda: Secretary

Secretary O'Neil presented the consent agenda. This includes the draft meeting agenda for May 11, 2023, the acceptance of the terms contained in the [patent slides](#) by all attendees, and approval of the minutes from the last meeting held on November 9, 2022. The consent agenda was approved as presented. (See Attachment A for the approved agenda. See Attachment B for the Approved Minutes of the November 9, 2022 meeting.)

3.0 Review of [Subcommittee Membership](#) and Scope: Secretary

3.1 Review of Membership – Members at Risk. Secretary Janet O'Neil reviewed the Member Attendance Log included in the agenda. (See Attachment A). There are no members at risk of losing their membership by having missed three consecutive meetings.

3.2 Consideration of New Members – Working Group Rosters

A new membership application was received from Alain Abou-Zied with ISED Canada. He is interested in joining the Working Group for C63.25.3. His Working Group application will be voted on under New Business. Gia-Piao (GP) Chin with UL (Fremont, CA) is interested in joining the C63.25.3 Working Group. His membership was endorsed by Working Group chair Nick Abbondante. His membership application and CV were distributed to the SC1 committee. A vote to approve this WG membership application will be taken under New Business. Richard Bowman (Intel) and David Schaefer (Element Materials Technology) are interested in joining the C63.4 Working Group. Their respective applications were endorsed by Andy Griffin. A vote to approve these WG membership applications will be taken under New Business.

Mike Heckrotte with UL (Fremont, CA) is interested in joining SC1. His membership application, endorsement emails, and CV were distributed to the SC1 committee. A vote to approve this SC1 membership application will be taken under New Business.

The current Working Group Roster is shown [here](#).

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

3.3 The SC1 Scope was confirmed as follows:

Subcommittee 1 provides the technical expertise and resources necessary for maintaining existing and newly proposed C63® and other standards documents. Subcommittee 1 addresses new and existing measurement methods, site qualification methods, calibration methods, associated instrumentation, and limits development as assigned by the Main Committee ANSI-ANSC C63®.

Randy Long moved to approve the change in the scope to revise from ANSI to ANSC. The motion was moved, seconded and approved.

3.4 Approval of Duty – The list of standards as currently appears on the C63 website, for which SC1 is responsible, were reviewed. **SC1 approved the list of standards, but agreed the list is out of duty.**

ACTION ITEM: Zhong Chen (SC1 Chair) to update the list of standards currently on the C63 website so it aligns with the committee’s duty.

4.0 Working Group Reports

C63.2: Field Strength Measuring Instrumentation

Chair Zhong Chen reported for Jens Medler, Working Group Chair. As of April 7, 2023, the submission of BSR-9 was held up until the negative balloter either replied to the secretariat or the 30-day waiting period expired. Once either is met, the BSR-9 will be submitted. *Note: Subsequent to the SC1 meeting, Jennifer Santulli with IEEE advised that C63.2 is now at BSR-9. The submission of BSR-9 was held up until the negative balloter either replied to the secretariat or the 30-day waiting period expired. Jennifer indicated at the C63 steering committee meeting that C63.2 has just entered BSR-9 process.*

C63.4: Emissions Measurements

Working Group Chair: Andy Griffin

Status: C63.4: Current-2014. New PINS approved by WG, SC1 and C63 in Nov. 2017. The draft was considerably revised in late 2020; latest draft circulated to SC1 in mid-2021. Publication timing will be dependent upon publication of C63.25.2 to make sure these documents are harmonized.

Andy Griffin remotely presented his report. (See Attachment C.) A vote on the latest draft closed on Feb. 21, 2020 and passed (14 yes, 10 no, and 3 abstain). Eight members submitted a total of 122 comments. Since the start of 2023, the Working Group has met every two weeks to try and sort out the remaining issues. More members are wanting to contribute which is very positive.

Andy summarized the technical issues and recent Working Group activity related to C63.4:

- a. The WG went through the comment matrix from the SC and reviewed all of those that were not accepted.
- b. LISN Calibration. The WG (particularly Mike Heckrotte) has studied the performance of LISNs (AMNs) and in the end we have still basically adopted the CISPR 16 requirements, but without the statement that the LISNs have to meet the requirements at any impedance. The main issue is at the very low frequency (around 9 kHz) where it would be better to do a calibration with the mains open and short, but we only require calibration for open. We added a note that upon first use, it is recommended to measure the insertion loss with the output open and short. The WG added the insulation / phase requirements from CISPR 16.

- c. We need to define the requirements for the calibration / verification / characterization of passive components and pre-amps. The group is debating the meaning of terms but we need to define what the standard expects.
- d. We still intend to reference C63.25.2 for NSA, understanding that some additional work on this document is required.
- e. Agreed the responses of input on the definitions from SC2.
- f. We need a process for validating the rate of change of speed of the tower during analyzer / receiver sweeping. The problem is similar to one defined in the NSA process. Tower height has to change less than 5 cm for a sweep of the relevant frequency range.
- g. We have solved most of the problems with the above 1 GHz test procedure again aligning mostly with CISPR 16, however when the 3 dB does not encompass the EUT, then need to scan to the height of the EUT. (Using the same 5 cm in height change from the NSA requirement.) We have improved the minimum azimuth setting, for example above 1GHz, measure every 15 cm, then do a further scan +/- 15cm (at least at every degree) around the worst case response. There are no additional requirements if the 3 dB beamwidth is less than the width of the EUT. However, we have added information that the user could invest the issue move the antenna back for example. Improved the definition of the antenna 3 dB beamwidth, and remove the concept of active EUT area.
- h. Removed the monopole antenna from the document, no longer used by MIL STD/GR 1089.
- i. We are still updating the document based upon the input from SC1 and the Task Force.

C63.5: Antenna Calibration

Working Group Chair: Doug Kramer

Status: Current-2017

Doug advised that he is no longer available to chair the Working Group. Nate Potts agreed to become the Working Group chair. Nate said the activity is on hold pending resolution of C63.25.2 and C63.4. Zhong encouraged the WG to move forward with incorporating C63.25.2 into the C63.5 draft since C63.25.2 has been balloted. Nate acknowledged that the WG has already incorporated the necessary updating to reflect the changes in C63.25.2. David Knight with NPL was suggested as a possible vice-chair to Nate Potts.

C63.7: Construction of Test Sites

Status: Published update on March 9, 2015; Working Group disbanded. Nothing new to report.

Working Group Chair: None – Candidate Requested

This document and needs basic revisions beyond adding chambers. For example, it states a ground plane is not necessary on an OATS. A three-page amendment was suggested to be added to the standard, but a Working Group chair is needed to initiate this work.

The committee supported the idea of keeping C63.7 as a separate standalone document.

ACTION ITEM: Anyone interested in Chairing the WG and drafting a new PINS for revision of C63.7 should contact Zhong Chen.

C63.23: Jack McFadden Presentation on Measurement Uncertainty

Jack McFadden with ETS-Lindgren presented remotely on current activity in his lab on the topic of measurement uncertainty (MU). (See Attachment D.) He presented ideas of using statistical process in applying MU, and possible inclusion in C63.23. David Zimmerman and Nick Abbondante offered comments. Consensus was that Jack's suggested method may not be viable to implement in the real-world. Jack is proposing to add his method to the next edition to C63.23 as an option to help guide people to collect and validate data. It was noted that P2665 is being published in the IEEE EMC Society.

Action Item: Jack McFadden to formulate a new PINS with Zhong's assistance to provide a SOW on plans to revise C63.23. Jason Nixon to send Jack his expired/withdrawn PINS so his topics can possibly be incorporated into the new PINS.

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

This work addresses the family of C63.25 standards:

- o C63.25.1 (1 GHz to 18 GHz) TDR – Published March 2019 – WG Chair: Dan Sigouin
- o C63.25.2 (30 MHz to 1000 MHz) NSA – Work began in January 2019 – WG Chair: Dan Sigouin
- o C63.25.3 (18 GHz – 40 GHz) – Future plan to address NSA above 18 GHz – WG Chair: Nick Abbondante

On C63.25.2, Bob DeLisi reported that the C63.25.2 ballot closed with a 55% response rate and a 86% approval rating. Over 275 comments were received that have to be addressed. Bob will reconvene the Working Group and invite those with the most comments (ISED and Nick Abbondante) to join the WG so their comments can be resolved in real time. Bob DeLisi volunteered to chair the WG; and he asked Allen Crumm to be his secretary. Andy said he would help out in doing the editing of this document before it is sent to the SC1 committee to review. Bob said the WG will meet weekly to start addressing the comments and expand its editing group.

On C63.25.3, Working Group chair Nick Abbondante presented his report. (See Attachment E.)

This standard will specify the types of test sites and validation methods for use from 18 to 40 GHz for reference in product specific test method standards. The test environments include:

- SAC/OATS/FAR/FSOATS
- Compact Antenna Test Range (CATR)
- Reverberation Chamber

Following is an update on task group activity:

SAC/OATS/FAR/FSOATS: Martin Wiles is the task group chair. They are exploring use of sVSWR, Time Domain sVSWR, and Mode Filtered sVSWR techniques. CMF Pre-RRT is largely complete and demonstrates the need for validation as not all chambers 'pass'. Also documented some challenges related to turntables and antenna nulls specifically for horizontal measurements. sVSWR and TD-sVSWR work is on hold. The task group continues to explore antenna options – past pre-RRT testing used the prototype ETS 3185 antenna; NIST has obtained an antenna from A-Info, Phil Miller has acquired an antenna, Zhong Chen is designing an Alford Dipole (biconical magnetic loop similar to the ones used in CTIA). The next meeting will be held on June 19.

CATR: Robert Paxman is the task group chair. They have held several meetings since the last SC1 meeting. The task group has many new members that were recruited at the IEEE EMC Symposium and at EMC Europe. Active discussions are occurring, including presentations on CTIA and IEEE 149. Text is being originated by one of the new task group members for future review. The next meeting will be held on May 16.

Reverberation Chamber: Phil Miller is the task group chair. Multiple new members have joined the group via NIST as well as recruiting at the IEEE EMC Symposium and at EMC Europe. Ongoing meetings are occurring with active discussions. Garth D'Abreu provided text which was reviewed and commented on by Jason Coder and John Ladbury, this text is now the focus of discussions within the task group. The next meeting will be held on June 8.

In summary, the draft text is currently on hold while the Cylindrical Mode Filter demos/round robin tests are ongoing. The demos of CMF sVSWR continue, which in some cases has contributed to the round robins. Completion of the document is likely at least a year or two away; at this time reverb and CATR test environments may have to wait for the next edition.

Zhong reminded SC1 of the continued coordination needed among the three standards C63.25.2, C63.5, and C63.4 regarding site validation requirements. The C63.25 standards will have the sole responsibility for site validation. New versions of C63.4 and C63.5 are supporting documents on this topic and will defer to C63.25.2 for site related requirements.

5.0 Old Business – Chair

There was no old business to discuss.

6.0 New Business – Chair

6.1 Review of Definitions from SC2: The Chair noted there are 20 new terms that require review. Marcus Shellman will send the list to Zhong to review with Andy and Bob in order to determine if terms need updating.

6.2 Coordination with SC3 for Harmonization: As a result of discussion within the parent committee, this effort to harmonize C63 standards with other industry standards such as CISPR will be revisited to maximize efficiency. SC1 was advised to remove this activity from future meeting agendas.

6.3 C63.25.3 Working Group New Member Application: A vote was taken to approve the application of GP Chin to join the C63.25.3 Working Group. Nick Abbondante moved to approve CP Chin's application to join the C63.25.3 Working Group.

6.4 C63.4 Working Group New Member Application: A vote was taken to approve the application of Richard Bowman and David Schaefer to join the C63.4 Working Group. Andy Griffin moved to approve the applications from Richard Bowman and David Schaefer to join the C63.4 Working Group.

6.5 SC1 New Member Application: A vote was taken to approve the application of Mike Heckrotte to join SC1. Andy Griffin moved to approve the application of Mike Heckrotte to join SC1.

One vote was taken to approve the respective applications of GP Chin, Richard Bowman, David Schaefer, and Mike Heckrotte. The motion/vote was presented, seconded, and passed for all four applications.

6.6 FCC CIRC 2303-05 (ET Docket No 21-363) - Incorporating by Reference C63.25.1, C63.10:2020, C63.4a: 2017: Zhong provided an update on the latest news related to C63 SC1 activity and the FCC.

6.7 SC1 Leadership Transition: Zhong noted that his term as SC1 Chair ended on December 31, 2022. Bob DeLisi suggested Andy Griffin to chair SC1. Andy Griffin was nominated by SC1 to be the next Chair. It was moved and seconded to approve Andy Griffin's appointment as the SC1 chair for the current term 2023-2025.

7.0 Interpretation Requests: Zhong Chen reviewed the following interpretation request:

C63.4 (2014) Conducted Emissions LISN Choke received from Henrik Nielsen, request dated November 18, 2022. A task group chair and members are needed. David Zimmerman volunteered to be the task group chair. Nate Potts, Nick Abbondante, and Andy Griffin volunteered to be task group members.

[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.

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

On behalf of Jerry Ramie, Zhong requested that SC1 members be specific with any requests for postings to the website. Zhong asked SC1 members to be sure to update or confirm with Jerry directly that they are correctly listed on the website.

9.0 Review of 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 May 11, 2023 meeting to the committee.

10.0 Time and Place of Next Meeting: Chair

Zhong Chen advised that SC1 would meet on October 4, 2023 from 3:00 – 5:00 pm at Google in Mountain View, CA.

11.0 Closing Remarks and Adjournment: Chair

With no further business, Zhong Chen adjourned the meeting at 5:00 pm CDT. He thanked everyone for attending the meeting.

Minutes submitted by:



Janet O'Neil, Secretary, SC1

ATTACHMENTS

- Attachment A: Approved Agenda for May 11, 2023 SC1 Meeting
- Attachment B: Approved Minutes from November 9, 2022 SC1 Meeting
- Attachment C: Griffin Report on C63.4
- Attachment D: McFadden Presentation on Measurement Uncertainty
- Attachment E: Abbondante Report on C63.25.3