

Before the Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
)
Amendment of Parts 0, 1, 2, and 15 of the)
Commission's Rules regarding)
Authorization)
of Radiofrequency Equipment)
) ET Docket No. 13-44
Amendment of Part 68 regarding) RM-11652
Approval of Terminal Equipment by)
Telecommunications)
Certification Bodies)

To: The Commission

**COMMENTS OF
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ACCREDITED STANDARDS COMMITTEE C63®**

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EXECUTIVE SUMMARY

The American National Standards Institute Accredited Standards Committee C63[®] (“ASC C63”) supports the Commission proposals to update the Commission’s rules to cross reference the standards known as ANSI C63.4-2009: “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz” (“C63.4-2009”) and ANSI C63.10-2009: “American National Standard for testing unlicensed wireless devices” (“C63.10-2009”). The incorporation of these standards in the Commission’s rules will provide manufacturers with more clarity and remove certain inconsistencies from the prior standard.

The Commission raises a number of issues in its Notice of Proposed Rulemaking (“NPRM”) in this proceeding related to the implementation of these measurement procedures and, in response, ASC C63 offers the following comments and recommendations:

* With respect to site validation for measurements between 1 GHz – 40 GHz, ASC C63 recommends that the Commission accept both testing options in C63.4-2009 (*i.e.*, CISPR 16 compliance or a minimum coverage area with minimum-rated attenuation) after a transitional period (such as one year) which commences at the time of publication of final rules in the Federal Register, and provide a longer implementation period (*e.g.*, two additional years) for requiring only the CISPR 16 compliance requirements to reduce the immediate burden on the testing industry.

* ASC C63 recommends that the Commission include the use of hybrid antennas in this rulemaking provided that the laboratory can show that their hybrids can provide results which give similar results using Biconical or Log Periodic antennas, with an acceptable degree of accuracy.

* ASC C63 supports the Commission's proposal to only incorporate the C63.4-2009 standard (rather than CISPR 22) into the Commission's rules for measuring equipment subject to Part 15.

* ASC C63 responds to various issues raised by the Information Technology Industry Council related to C63.4-2009 in its comments filed in response to the ASC C63 Petition for rulemaking filed in 2011.

* ASC C63 fully supports the Commission's efforts to allow a simplified process for the acceptance of new versions of reference standards and agrees that the Chief Engineer in the Office of Engineering and Technology should be delegated authority to update reference standards that do not raise major compliance issues as proposed in the NPRM.

Moreover, ASC C63 expects to publish updated versions of C63.4 and C63.10 in 2013, and recommends that the Commission take appropriate steps to update the appropriate references within the rules as soon as the standards are published, with a suitable transition period.

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COMMENTS

In response to the Federal Communications Commission’s (“Commission’s”) Notice of Proposed Rulemaking in the above-captioned proceeding¹ the American National Standards Institute Accredited Standards Committee C63[®] (“ASC C63”) submits these comments. ASC C63 commends the Commission for issuing this NPRM which, among other things, proposes to update the Commission’s rules to cross reference the standards known as ANSI C63.4-2009: “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz” (“C63.4-2009”) and ANSI C63.10-2009: “American National Standard for testing unlicensed wireless devices” (“C63.10-2009”). The Commission’s proposed actions are generally consistent with the suggestions recommended by ASC C63 in its 2011 petition for rulemaking.²

¹ In the Matter of Amendment of Parts 0,1, 2, and 15 of the Commission’s Rules regarding Authorization of Radiofrequency Equipment and Amendment of Part 68 regarding Approval of Terminal Equipment by Telecommunications Certification Bodies, ET Docket No. 13-44, RM-11652, *Notice of Proposed Rulemaking* (rel. February 15, 2013) (“NPRM”).

² See Petition for Rulemaking filed by ANSI ASC C63 on September 27, 2011, RM-11652 (“ASC C63 Petition”).

Introduction and Background

ASC C63 has been involved in the development of standards for the measurement of emissions from unintentional radiators since its first publication in 1963. In 1991, the ANSI C63.4 standard was updated to take into account measurement of complex systems such as information technology equipment, and in 1992 the standard was updated to include the measurement of emissions from intentional radiators. The task group responsible for the 1992 version included representatives from the Commission to ensure that the needs of the agency were taken into account. In the intervening years, the Commission has referenced this standard in its rules. Currently, the Commission permits parties to demonstrate EMC compliance by satisfying the C63.4-2003 standard or the C63.4-2009 standard for intentional and unintentional radiators; and the C63.10-2009 standard for unlicensed wireless devices.

For the reasons discussed herein and, as set forth in the ASC C63 Petition, we believe the Commission should update its rules to require compliance with the C63.4-2009 version of the standard rather than the outdated C63.4-2003 version. In addition, we support adoption of a rule to allow compliance with C63.10-2009. Nonetheless, the NPRM raises a number of issues related to the implementation of these measurement procedures and ASC C63 offers comments on these issues as follows.

Test Site Validation (¶¶ 57-59)

Pursuant to C63.4-2009, facilities suitable for measurements between 30 MHz – 1 GHz are considered suitable for measurement between 1 GHz – 40 GHz when used with RF

absorbing materials covering the ground plane provided: (i) the CISPR 16-1-4:2007 (“CISPR 16”) validation criterion is satisfied; or (ii) a minimum area of the ground plane (in either an Open Area Test Site or a semi-anechoic chamber) is covered between the antenna and equipment under test (EUT”) using RF absorbing materials with a minimum-rated attenuation of 20 dB up to 18 GHz. ASC C63 submits that this is preferable to C63.4-2003, which alternatively allows test sites used above 1 GHz simply to meet the normalized site attenuation requirements applicable to facilities used for making radiated emissions below 1 GHz.³

However, the NPRM proposes to only allow site acceptance to be based upon the S_{VSWR} requirements of CISPR 16 (which is consistent with the first of the two options set forth in C63.4-2009), apparently in an effort to be consistent with CISPR 22⁴ (which references CISPR 16). ASC C63 is concerned that, by adopting this approach (and not giving test facilities the second option permitted under the C63.4-2009 standard), some facilities will face hardships in complying with this requirement. Specifically, ASC C63 believes that to enforce these rigorous requirements in a short time frame will put an undue burden on many laboratories. Indeed, ASC C63 is aware of many laboratories and facilities which have not yet been upgraded to meet the S_{VSWR} requirement and we

³ See KDB 704992: (704992 Site Validation Requirements above 1 GHz) <https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?id=44117&switch=P>, and KDB 974614: (974614 Accredited Test Firm Roles) <https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?switch=P&id=44684>. See Section 8.

⁴ CISPR 22, Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement.

understand that the upgrading process can be in excess of \$100,000 per facility.⁵ This cost is particularly significant for small laboratories with limited budgets. The alternate method of using absorbers as set forth in C63.4-2009 is still a viable and accurate method to conduct the measurements for those facilities that cannot satisfy the CISPR 16 validation criterion and should be allowed, at least for some interim period. Accordingly, ASC C63 recommends that the Commission accept the options in C63.4-2009 during a transitional period (*e.g.*, within 1 year) and provide a longer implementation period (*e.g.*, 3 years) for requiring only the CISPR 16 compliance requirements to reduce the immediate burden on the testing industry. During this transition period (*e.g.*, 2 years) the test laboratory will have a choice of either compliance with CISPR 16 or the second option set forth in C63.4-2009.

Measurement Procedures: Part 15 Devices (¶ 67)

ASC C63 fully supports the Commission's proposal to incorporate C63.4-2009 as the test procedure the Commission will use for determining the compliance of intentional and unintentional radiators and C63.10-2009 as the procedure the Commission will use for determining the compliance of unlicensed wireless devices. In addition, we raise several additional issues associated with the ongoing development and improvement of these standards.

⁵ The costs to add and/or replace absorbers in older chambers are more likely to be at this level. However, costs will vary from site-to-site.

1. New Version of C63.10

The second edition of C63.10 has recently been approved by ASC C63, and likely will be published sometime in 2013. The approved document includes updated procedures that are consistent with recently issued Commission Knowledge Database (“KDB”) test procedures such as KDB 558074,⁶ D01 DTS Measurement Guidance v03; KDB 789033,⁷ D01 General UNII Test Procedures v01r03; and KDB 662911,⁸ D01 Multiple Transmitter Output v01r02. We, therefore, recommend that the Commission take appropriate steps to update the reference within the rules to the ANSI C63.10-2013 version as soon as it is published, with a suitable transitional period, using the procedure defined in ¶69 of the NPRM.

2. New Version of C63.4

ASC C63 is further modifying the C63.4 standard and expects to publish an updated version in late 2013. The 2013 draft version has been through the ASC C63 internal balloting process on multiple occasions, and we anticipate closing the balloting period in the near term to effectuate the finalization of the latest version. Those items not entered into this last recirculation will be kept on file for consideration in the next edition, including updates to the 2 dB rule and the above-referenced 1GHz test methodology. We understand that this draft cannot be referenced directly within the Commission’s rules at this time. However, some of the updates to this standard will be useful and should be considered by the Commission when it provides guidance related to this standard.

⁶ <https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?id=21124&switch=P>

⁷ <https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?id=52935&switch=P>

⁸ <https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?id=49466&switch=P>

3. Hybrid Antennas

Based on recent ASC C63's experience and what is defined in CISPR 16 (specifically, CISPR 16-1-4 clause 4⁹), hybrid antennas (which are linear polarized antennas that include both biconical and log periodic elements) are effective in performing final radiated emission measurements. In addition, they have been used in industry for around twenty (20) years without major difficulty. Since C63.4-2009 does not expressly indicate that hybrid antennas may be used for performing final radiated emission measurements (though it does not exclude them either), we recommend that the Commission include the use of hybrid antennas in this rulemaking provided that the laboratory can show that their hybrids can provide results which give similar results using Biconical or Log Periodic antennas, with an acceptable degree of accuracy. The method of correlation with common antennas that are used in the same frequency bands covered by typical hybrids is presented in Annex N of the current draft of C63.4-2013. The antenna calibration maintenance team in ASC C63 has agreed with the recommendations in Annex N as that text was forwarded to the maintenance team for their consideration in producing the next edition of ANSI C63.5.¹⁰

⁹ Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radiated disturbances.

¹⁰ ANSI C63.5-2006: "American National Standard for Electromagnetic Compatibility–Radiated Emission Measurements in Electromagnetic Interference (EMI) Control–Calibration of Antennas (9 kHz to 40 GHz)" ("C63.5-2006") is the ANSI standard for antenna calibration. Given the nexus between hybrid antennas and antenna calibration, the maintenance team for C63.5-2006 is assessing these issues.

In addition, there was a tutorial at the IEEE symposium in Pittsburgh 2012 giving further details on how this correlation can be shown.¹¹ Finally, there is an informative interpretation sheet issued by ASC C63 as a guide on how to deal with hybrid antennas.¹² These are very useful references to be used when considering changes in this rulemaking proceeding.

Adding a solution for hybrid antennas to this rulemaking proceeding would also solve similar issues with C63.10-2009. Ultimately, we anticipate that the updated (but not yet published) C63.4 and C63.10 standards will address use of hybrid antennas. In the meantime, we recommend that the Commission take the steps described herein.

4. Character size

The C63.4-2009 standard requires the displayed pattern for graphics capable monitors to be plain Sans Serif font type with a font size to get as close as possible to three characters per linear cm, and use single line spacing.¹³ Because this requirement is based upon a specific number of characters in relationship to spacing, as the monitor size increases, the font size needs to decrease. So for larger monitors, this requirement cannot be achieved because they do not support small enough fonts. However, the draft 2013 version of this

¹¹ The tutorial will be repeated at the IEEE symposium in Denver in 2013. *See* discussion herein regarding ¶68 for further information.

¹² See http://www.c63.org/documents/misc/interpretations/C63.4-2009_explanation_Hybrid_antennas_30_to_1000_MHz_rev3_Mar_2012.pdf

¹³ C63.4-2009, 11.10 figure for Clause 11.

standard would address this concern. Specifically, the current draft of the 2013 standard includes the following requirement:

For monitor with horizontal screen size 13 inches or less, set plain San Serif to get as close as possible to three characters per linear cm, and use single spacing. For monitor with horizontal screen size greater than 13 inches set plain San Serif to get as close as possible to three characters per linear cm or use a font size so that the number of characters displayed is as close as possible to 100 characters per line. In each case, use single spacing.¹⁴

Again, we urge the Commission to incorporate this requirement into its rules by initiating a rulemaking proceeding once the next version of ANSI C63.4 is published which incorporates the modified text. By doing so, the Commission will provide the industry with clarity and guidance on this issue.

Decision Not to Incorporate CISPR into Commission Rules (¶68)

ASC C63 supports the Commission's proposal to only incorporate the C63.4-2009 standard (rather than CISPR 22) into the Commission's rules for measuring equipment subject to Part 15. During the development of CISPR 22, the methodologies in C63.4-2009 were discussed and significant differences were identified in several places, as noted in the NPRM.¹⁵

Aside from those listed in the NPRM, another difference between C63.4-2009 and CISPR

¹⁴ Draft C63.4-2013, 11.10 figure for Clause 11.

¹⁵ For example, (i) CISPR 22 does not cover the necessary frequency range between 6 GHz and 40 GHz which ANSI C63.4 addresses; (ii) CISPR 22 applies to information technology equipment where ANSI C63.4 is applicable to all types of unintentional radiators; and (iii) the measurement procedure above 1 GHz in CISPR 22 does not require the receiving antenna to do a full height search for maximum emissions where ANSI C63.4 requires full height search. See NPRM at ¶68.

22 involves the option of measuring conducted emissions with tables at two heights. CISPR 22 allows this option, but C63.4-2009 does not. Because C63.4-2009 does not have a table height option it promotes greater consistency in results.

Nonetheless, ASC C63 remains open to further discussions on this topic when (and if) there is closer harmonization of the two standards. In addition, ASC C63 understands that CISPR 22 will likely be replaced by a new standard, CISPR 32, which adopts a different approach than its predecessor standard. As this occurs, ASC C63 is open to discussion on the potential harmonization of this standard with the C63.4-2009 standard (and/or the updated version of this standard).

Responses to Concerns About C63.4-2009 Raised by ITI (§168)

The Information Technology Industry Council (“ITI”) raised a number of issues related to C63.4-2009 in its comments filed in response to the ASC C63 Petition. In the NPRM, the Commission seeks input on some of these issues. Below are ASC C63’s responses to some of these specific issues.

- 1. Specifically, is ANSI C63.4:2009 more burdensome than previous editions as ITI alleges, and if so, do the benefits of these increased burdens (e.g., increased accuracy and/or consistency of test results) outweigh their costs?**
C63.4-2009 provides manufacturers and test labs with more clarity than C63.4-2003 and removes certain inconsistencies from the prior standard. For example,

there is more information on the use of spectrum analyzers and it clarifies antenna calibration requirements by referencing ANSI C63.5 -2006. ASC C63 recognizes some of ITI's concerns (e.g, the modification of the 2 dB rule and the need for further clarification of the use of hybrid antennas for both compliance and site validation measurements) regarding ANSI C63.4-2009 and intends to address many of these in the standard making process for the next version of C63.4 which it hopes to publish this year. In addition, as discussed above, the issue of site calibration above 1 GHz imposes an additional burden on test labs. ASC C63 is confident that the increased benefits of the new standard outweigh any increased burdens.

2. **Do certain changes in C63.4-2009 cause problems for manufacturers and/or test laboratories, such as a restriction on the use of hybrid antennas or the 2 dB rule?**

As discussed above, there is a concern about how C63.4-2009 impacts the use of hybrid antennas. Hybrid antennas have been recognized as valuable measurement instruments and the next version of ANSI C63.4 (which is anticipated to be published in 2013) will expressly allow use of hybrid antennas during all measurements including those for site qualification and preliminary testing, through final compliance testing if certain requirements are met. In the meantime, ASC C63 recommends that the Commission specifically allow the use of hybrid antennas. Also, as discussed above, the 2 dB rule changes also are under discussion for a future edition of the C63.4 standard.

3. **Would the references to undated standards in C63.4-2009 force parties to comply with future changes to those standards with no opportunity for comment and no transition period?**

ASC C63 has reviewed the merits of dating referenced standards. It was decided for C63.4-2009 that any standards referenced therein and not produced by ANSI ASC C63 will need to be dated. The reason for this is because referenced standards not developed by ANSI ASC C63, if changed, would have to be followed despite ASC C63 having had no input into their development. On the other hand, for referenced standards under ASC C63's control, the committee will closely study the impact of the revisions and ensure that their impacts are carefully reviewed and effectively communicated and include transitional arrangements within the C63.4 and C63.10 standards (if required). ANSI C63 agrees that having undated references will make it slightly more complicated to track, but the user of the standard will know which standards are undated and hence can comment on these documents using the standard ANSI processes. ASC C63, will monitor the effectiveness of having undated reference and if it becomes problematic, will consider reverting to dated references.

4. **Should the Commission accept interpretations of C63.4-2009 and C63.10-2009 on ANSI's web site?**

Recently, ASC C63 requested clarification by ANSI of whether interpretations are normative or not. ANSI's response was that they are not normative until included in the normative part of a standard which has gone through the full approval

process by ANSI ASC C63. Future ASC C63 standards will make clear that any interpretations on the ASC C63 website are only informative and not to be considered as part of their standards. A note to this effect will also be on the ASC C63 website. Because of this recent information, ASC C63 is no longer requesting that the FCC accepts interpretations on the ASC C63 web site, and are developing an amendment process to enable changes to relevant standards more quickly.

5. **Could the Commission address ITI's concerns about ANSI C63.4 -2009 and ANSI C63.10 -2009 by not incorporating certain sections of these standards into the rules? If so, which particular sections should not be incorporated and why?**

C63.4 was developed for general emission measurement use, beyond that needed by the FCC. Hence it is not surprising that parts of the standard may not be needed or wanted by the FCC for their purposes. The FCC then has taken the action of not using a few sections in C63.4. This does not diminish the main usefulness of the standard.

There was no specific exception to the use of hybrid antennas in C63.4-2003. A different approach was taken in ANSI C63.4-2009 which is cited in Table 1 of the standard, only classical individual antennas to cover the frequency range 30 to 1000 MHz. However, in text, "a linearly polarized broadband antenna" requirement is cited which leads to interpretations that were made that hybrids are

allowed for final compliance testing. Hence, an FCC statement allowing the use of hybrid antennas could satisfy one of ITI's concerns.

Referring to the 2 dB rule from C63.4-2003, there was an additional consideration in C63.4 -2009. The rule was expanded as there is the possibility that measurements could trend towards the limit or to exceed the limit even with less than 2 dB changes occur when adding cables and plug-in modules. However, arguments have indicated that current text is too cumbersome. The rule is being reviewed for a future revision of C63.4.

To summarize its views about the benefits of the C63.4-2009 standard, ASC C63 believes that the technical improvements of the new standard promote better accuracy (measuring closer to the actual maximum signal from the equipment under test), and more repeatability and reproducibility. A significant majority of the ANSI balloters approved this version and there were no objections that surfaced from the ANSI public review process. ASC C63 understands that with any change there are costs involved. These changes (and the need for these changes) are documented in the ASC C63 Petition.

Delegated Authority to update measurement procedures (§§69-70)

ASC C63 fully supports the Commission's efforts to allow a simplified process for the acceptance of new versions of reference standards and agrees that the Chief Engineer in the Office of Engineering and Technology should be delegated authority to update reference standards that do not raise major compliance issues as proposed in the NPRM. In these situations, we note that even a simple updating of the year of a standard (or adding an amendment to the standard) will take time to implement. For example, test report templates, test procedures, lab accreditation schedules and other related information will need to be updated in these situations which could take months (or longer) to implement.¹⁶

Transition period (§73)

Paragraph 73 of the NPRM addresses various transition period issues related to lab accreditations and the new site validation requirements. ASC C63 fully supports the one-year transition period (*i.e.*, one year after publication of final rules in the Federal Register) for site validation. ASC C63 also supports a similar one-year transition period for the full implementation of all requirements set forth in the C63.4-2009 and C63.10-2009 standards. In this regard, we urge the Commission to provide a clear statement about implementing the C63.4-2009 version, such as the following:

¹⁶ We understand from anecdotal evidence that lab accreditation schedules are typically updated every 24 months, but for this type of change (where no lab visit would be required) it is expected to be just an administrative paperwork effort.

“During a transition period which ends one year after publication of final rules in the Federal Register (“Transition End Date”), parties may continue to comply with either (i) C63.4-2003 or (ii) C63.4-2009; and after the Transition End Date, only compliance with the C63.4-2009 standard will be accepted. The testing requirements set forth in C63.4-2009 (and C63.10-2009) only apply to models tested after the Transition End Date. Existing models tested on or before the Transition End Date and that were in compliance with C63.4-2003 at the time of testing shall remain compliant under the requirements of that previous issue.”

* * * * *

We thank the Commission for this opportunity to share our comments in this proceeding.

Respectfully submitted,

**American National Standards Institute
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