



2 August 2022

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Minutes

Committee: TC-2; Electromagnetic Compatibility (EMC) Measurements
Place: Room 303A, Spokane Convention Center, 334 W Spokane Falls Blvd,
Spokane, WA 99201.
Date: 2 August 2022 (Tuesday)
Time: 7:00 to 8:30 AM Pacific Time

1.0 Call to Order/Introductions

1.1 Quorum Check: TC-2 Meeting Quorum shall be 20% of the membership. Ballots for new officers shall have minimum voting participation of 50% and may include email ballots in the participation count.

8/15 or 53% of membership attended. 2 guests.

1.2 Charter

The committee reviews the adequacy of measurement procedures and measurement instrumentation specifications for radiated and conducted emission and immunity tests. Also discussed is the rationale for product emission limits and immunity test levels including performance requirements. The committee also supports EMC standards and procedures that deal with measurements and their uncertainty and how they are interpreted and applied.

2.0 Approval of Minutes from IEEE EMC TC-2 meeting (27 Jul 2021) at the IEEE EMC+SIPI 2021 Virtual Symposium.

3.0 TC-2 Election Announcement

Our last TC-2 election was held by email from 3rd-29th September 2020, and the members have elected the following officers: Tom Fagan as new chair, Monrad Monsen as new vice-chair, and Ghery Pettit and Ahalya Srikanth as secretaries. Our next election will be held in summer of 2023 with the next officer transition occurring on 1 January 2024.

4.0 Privacy

Personal data will be handled in accordance with the IEEE Privacy Policy which can be found at: <https://www.ieee.org/security-privacy.html> . The TC-2 minutes will have list attendee names unless you contact the TC-2 secretary to ask for your name to not be

mentioned. The information you provide in the sign-in roster (including email and company) will be used by the chapter officers for TC-2 related notifications/communications.

Note: For any attendees that are participating remotely, please ensure that your full name appears on the Webex call. Also, please send the secretary an email (srikanth.ahalya@ieee.org) with your name, company and email address. (This will ensure that you are included in the attendance and will be on the distribution list for future TC-2 email news and meeting announcements).

5.0 Committee Membership Status

5.1 Removal of non-active participants from membership roster.

Membership indicates that you have attended the TC-2 committee meeting at least two (2) or more times in the last four (4) years; candidates are shown as attending a single meeting on or after 2019 and no other. By committee rules, these candidates are not members of TC-2 unless they attend a second TC-2 meeting within a four year period.

All attendees will initial the sign-in roster. After the August 2022 TC-2 meeting, those that have not attended a TC-2 meeting since 2019 will no longer be a TC-2 member but will remain on the list for one additional year (2023) to receive meeting announcements. Those that have not attended a TC-2 meeting since 2018 are removed from the list. Any of those that are dropped from the membership list can rejoin TC-2 by attending the requisite number of meetings in the time frame noted above.

6.0 Current Symposium Activity (IEEE EMC+SIPI 2022), August 2022

6.1 Symposium paper review status (top paper, top TC-2 paper, Round 2 reviewing, etc).

6.1.1 FULL PAPERS

- 1st round number submitted: 5
- Accepted: 5
- Rejected: 0

6.1.2 ABSTRACT REVIEW PAPERS

- 1st round number submitted: 6
- Accepted: 5
- Rejected: 1

6.2 Symposium Sessions sponsored by TC-2 as shown in the final program. TC-2 is to be congratulated for sponsoring or participating in the **Three** sessions/tutorials listed below.

- 02:00 PM-03:15 PM, Thursday (8/4/2022), “EMC Measurements 1” technical session, 3 presentations, Thomas J. Fagan (Chair), Monrad Monsen (Co-chair), Location: Room 401C.
- 03:40 PM-05:20 PM, Thursday (8/4/2022), “EMC Measurements 2” technical session, 4 presentations, Thomas J. Fagan (Chair), Monrad Monsen (Co-chair), Location: Room 401C.
- 8:30AM-12:00PM, Friday (8/5/2022): “Basic EMC Measurements” tutorial session, 5 presentations, Monrad Monsen (Chair).

7.0 Standards Sponsorship Support Review

Below is an excerpt of information from the full matrix from the EMC Society site.

Here is the part that standards play in Technical Committee activity. It is from the EMC Society Bylaws and in particular clause 10.3 which states:

10.3 Functions:

Each Technical Committee shall promote activities in its field of interest and shall provide expert knowledge and assistance to:

- a. Receive, generate, and review technical papers within its scope in cooperation with the Transactions Editor and/or the Technical Papers Committee.
- b. Organize and host sessions at meetings of the IEEE at all levels and at meetings of other organizations with which the Society is desirous of cooperating, in accordance with the rules in effect at such meetings.
- c. Arrange for publishing pertinent papers in IEEE publications.
- d. Generate and develop appropriate standards in its field for processing by the IEEE Standards Committee, through the Society's Standards Committee and in accordance with IEEE policies.
- e. Evaluate "state of the art" in the area of committee interest.

Clause 10.3 d above is directly applicable to TC-2 (EMC Measurements).

This table shows via the short title and highlighted in yellow those EMCS standards which directly involve measurements and hence TC-2 interest. Note that by far the number of standards devoted to measurements is the vast majority.

IEEE Standard	Title	Standard Expiration Date	Status	Chair and Sponsor Contact	PAR	Tech Comm	Notes
Std.139-1988	Recommended Practice for the Measurement of RF Emission from ISM Equipment on User's Premises (More information)	Expires: 12/31/2022	Current Standard	Past Chair: Daniel Weinberg Sponsor contact: Ed Hare	No active PAR	TC-2	No maintenance underway.
Std. 187-2003 Project 187	Standard Measurement Methods of Emissions from FM and Television Broadcast Receivers in the Frequency Range of 9 kHz to 40 GHz (More information)	Expires: 12/31/2028	Current Standard	Past Chair: David Traver Sponsor contact: Ed Hare	No active PAR	TC-2	No maintenance underway.
Std. 299-2006	Standard Method for Measuring the Effectiveness of Shielding Enclosures (ANSI Recognized) (More information)	Expires: 12/31/2022	Current standard	Past Co-Chair: Dale Svetanoff Past Co-Chair: Maria Sarto Sponsor contact: Ed Hare	No active PAR	Shielding CG	No maintenance underway. Shielding Continuity Group is evaluating next steps.

Std. 299.1-2013	Standard Method for Measuring the Shielding Effectiveness of Enclosures and Boxes Having Dimensions Between 0.1 and 2m (More information)	Expires: 12/31/2023	Current Standard	Past Chair: Maria Sarto Sponsor contact: Ed Hare	No active PAR	Shielding CG	No maintenance underway. Shielding Continuity Group is evaluating next steps.
Project 370	Electrical Characterization of Printed Circuit Board and Related Interconnects at Frequencies up to 50 GHz (More information)	Expires: 12/31/2030	Current Standard	Chair: Xiaoning Ye	No active PAR	TC4	No maintenance underway.
Std. 377-1980	Recommended Practice on the Measurement of Spurious Emissions from Land-Mobile Comm. Transmitters (ANSI Recognized) (More information)	Expired: 12/31/2018	Admin withdrawn	Sponsor contact: Ed Hare	No active PAR	TC2	Will not be updated.
Project 473	Recommended Practice for an Electromagnetic Site Survey (10 kHz to 40 GHz) (More information)	Expired: 12/31/2006 New project	Revision in progress	Chair: Chad Kiger Vice Chair: Secretary:	IEEE PAR Expires: 12/31/2022	TC3	Parallel development w C63.24. Project has been reassigned to TC3.
Std. 475-2000	Measurement Procedure for Field Disturbance Sensors , 300 MHz to 40 GHz (ANSI Recognized) (More information)	Expires: 12/31/2022	Current standard	Past Chair: Hugh Denny Sponsor contact: Ed Hare	No active PAR		Will administratively expire at the end of 2022.
Std. 1128-1998	Recommended Practice for RF Absorber Evaluation in the Range of 30 MHz to 5 GHz (More information)	Expires: 12/31/2022	Current standard Revision in progress	Chair: Zhong Chen Sponsor contact: Ed Hare	IEEE PAR Expires: 12/31/2023		Range being extended to 40 GHz. Cosponsored by Antennas and Propagation Society
Std. 1302-2008 Project 1302	Guide for the Electromagnetic Characterization of Conductive Gaskets in the Frequency Range of DC to 40 GHz (More information)	Expire: 12/31/2029	Current standard	Past Chair: Johan Catrysse Vice Chair: Gary Fennical Davy Pissoort Secretary: Yoeri Arien	No active PAR		Published November 7, 2019 No maintenance underway.
Std. 1309-2013	Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding	Expires: 12/31/2023	Current Standard	Past Chair: Zhong Chen Sponsor contact: Ed Hare	No active PAR		No maintenance underway.

	Antennas, from 9 kHz to 40 GHz (More information)						
Std. 1560-2013	Methods of Measurement of Radio Frequency Interference Filter Suppression Capability in the Range of 100 Hz to 10 GHz (More information)	Expires: 12/31/2023	Current standard	Past Chair: Kermit Phipps Sponsor contact: Ed Hare	No active PAR		No maintenance underway.
Std. 1597.1-2008 Project 1597.1	Standard for validation of CEM Computer Modeling (CEM) and Simulation (More information)	Expires: 12/31/2018 Admin withdrawn	Ballot group formed	Chair: Alistair Duffy Vice Chair: Secretary:	IEEE PAR Expires: 12/31/2022	Computational CG	In final stages of editing
Std. 1597.2-2010	Recommended Practice for Computational Electromagnetics (CEM) Computer Modeling and Simulation Applications (More information)	Expires: 12/31/2020 Admin withdrawn	Admin withdrawn	Past Chair: Andy Drozd Sponsor contact: Ed Hare	No active PAR	Computational CG	No maintenance underway.
P1613 Std. 1613-2009	Standard for Environmental and Testing Requirements for Devices with Communications Functions in Electric Transmission and Distribution Facilities. (More information)	Expires 12/31/2023	Being revised	Chair: John Tengden	IEEE PAR Expires 12/31/2022		Co sponsored with Power and Energy. Report needed.
Std. 1642-2015	Recommended Practice for Protecting Public Accessible Computer Systems from Intentional EMI (More information)	Expires: 12/31/2025	Current Standard	Past Chair: Bill Radasky Sponsor contact: Ed Hare	No active PAR	Intentional EMI CG (Radasky)	No maintenance underway.
Std. 1688-2015	Standard for Module Electromagnetic Interference (EMI) Testing (More information)	Expires: 12/31/2025	Current Standard	Past Chair: Fred Heather Sponsor contact: Ed Hare	No active PAR		No maintenance underway.
Project 1848	Techniques & Measures to Manage Risks With Regard to Electromagnetic Disturbances (More information)	Expires: 12/31/2030	Current Standard	Chair: Keith Armstrong Vice Chair: Alistair Duffy Secretary: Niklas Briest	No active PAR		No maintenance underway. New work being proposed.

Project 1897	Resolution of Power-Line Gap-Noise Reports (More information)	New project	Drafting in progress	Chair: Mike Gruber Vice Chair: Brian Cramer Secretary: Jerry Ramie	IEEE PAR Expires: 12/31/2022		Balloting group being formed.
Project 2425	Standard for Electromagnetic Compatibility Testing of Electrical and Instrumentation and Control Equipment at Nuclear Power Generating Stations and Other Nuclear Facilities (More information)	New project	Drafting in progress	Chair: Suresh Channarasa ppa Vice Chair: Secretary:	IEEE PAR Expires: 12/31/2023		Sponsor: Nuclear Power Engineering Committee (PE/NPE) Co-sponsor: EMS Society SDECom Work in progress, Report needed.
Project 2665	Recommended Practice for Statistical Process Control for EMC Test Laboratories (More information)	New Project	Drafting in progress	Chair: Kimball Williams Vice Chair: Secretary:	IEEE PAR Expires: 12/31/2023		Balloting group being formed.
Project 2710	Electromagnetic Shielding Performance of Enclosures for Portable Electronic Devices (More information)	New project	Drafting in progress	Chair: Alistair Duffy Vice Chair: Secretary:	IEEE PAR was admin withdrawn by SASB 12/3/2021	TC4	New PAR being voted on in SDECom.
Project 2715	Guide for the Characterization of the Shielding Effectiveness of Planar Materials (More information)	New project	Drafting in progress	Chair: Alpesh Bhohe Vice Chair: Davy Pissoort Secretary: Yoeri Arien	IEEE PAR Expires: 12/31/2022	TC4	Balloting group formed. SDECom voting to approved to send to ballot.
Project 2716	Guide for Characterization of the Effectiveness of Printed Circuit Board Level Shielding (More information)	New project	Drafting in progress	Chair: Davy Pissoort Vice Chair: Andy Marvin Secretary: Yoeri Arien	IEEE PAR Expires: 12/31/2022	TC4	Balloting group formed. SDECom voting to approved to send to ballot.
Project 2717	Passive Intermodulation Test Methods for Wireless Systems in Low Noise Environments (More information)	New project	Drafting in progress	Chair: Leo Liu Vice Chair: Secretary:	IEEE PAR Expires: 12/31/2023		Work in progress, on target.
Project 2718	Guide for Near Field Characterization of Unintentional Stochastic Radiators (More information)	New project	Drafting in progress	Chair: Valter Mariani Primiani Vice Chair: Secretary:	IEEE PAR Approved: 2/17/2017 Expires: 12/31/2021		Work in progress on target.

P2838	Standard for Aircraft Component Lightning Strike Direct Effects Qualification	New project	Drafting in progress	Chair: Fred Heather Vice Chair: Secretary:	IEEE PAR Expires: 12/31/2023		Work in progress on target
Project 2855	Recommended Practice for the Electromagnetic Characterization of Cable/Connector Assembly Shielding Effectiveness in Frequency Range of Direct Current to 40 GHz	New project	Working Group getting organized	Chair: Huadong Li Vice Chair: Secretary:	IEEE PAR Expires: 12/31/2024		Work in progress on target.
C37.90 Series	C37.90.1 -Surge protection C37.90.2 -Protective Relays C37.90.3 – ESD for protective relays	Existing standards. Revisions underway.	Various	Various	N/A	N/A	EMC Society seeking co-sponsorship of these standards as they come up for revision.

See https://ieeesdecom.s3.us-east-2.amazonaws.com/Standards_Matrix.pdf for the latest updates.

8.0 iNARTE Exam Question Review Activity

The iNARTE exam has gone to a 3rd party for creation and test question review, so no assistance has been asked for in recent years from TC-2.

Randy Jost reports that EMC Society has ended its Memorandum-of-Understanding (MOU) with Exemplar Global. A new committee will be setup to start a new certification program that includes more continuing education or furthering the EMC discipline even after the initial testing of an EMC body-of-knowledge.

9.0 Future Symposium Activity

9.1 Future topics and call for special sessions for the IEEE EMC+SIPI 2023 symposium in Grand Rapids, MI, USA on 31 July - 4 August 2023.

Special Session Proposal Schedule

- Tentative deadline: December 15, 2022

Special Session Papers

- Tentative deadline: January 10, 2023

Kimball Williams proposes to organize a tutorial on Project 2665 Statistical Process Control for EMC Test Laboratories in the EMC+SIPI 2023 symposium. Randy Jost would like to help with a paper on analyzing the uncertainty in the entire chain of the measurements. Kimball also suggests paper on arcs in power lines.

9.2 Technical Program Responsibilities and session chair reminders

We will not know how many sessions we will have at each symposium until the paper reviews are completed.

9.3 2023 Paper Review Deadlines

Proposed papers (full papers) due by about February 1, 2023.

Acceptance or accept conditioned on changes will be issued by about March 8, 2023.

Abstract review paper due about March 22, 2023.

Revised full paper due about April 4, 2023.

Final decision notification is about May 3, 2023.

Final paper (adding author names, etc.) is due about May 17, 2023.

9.4 Paper reviewers

TC-2 members are welcome to be paper reviewers. Please send Monrad and Tom your resume along with your subject matter strengths/expertise so we can identify the best papers for you to review. Those who did last year do not need to resubmit because Monrad still has this data. The TC-2 leadership team will send out the ScholarOne Abstracts link to the TC-2 distribution list to register for paper reviews.

9.5 New membership

We are always looking for more members that engage in the activities noted above.

9.6 New areas of interest

In discussion, suggestions included adding more presentations on military standards, shielding effectiveness, and calibration of test instrumentation.

10.0 Any other business?

11.0 Action Items

11.1 Action Item 2020-1: Tom Fagan will assess TC-2 membership interest in setting up teams to review existing untouched-for-years IEEE standards to assess their validity or whether they are subjects now addressed in other standards. He will work with Ed Hare on the details.

8/2/2022: Tom reports that the Education Chair is changing over to Karen Burnham. Tom will address this with her and give an update in 2023.

12.0 Set meeting and agenda for next meeting(s)

12.1 Grand Rapids, Michigan, USA, August 1st, 2023.

13.0 Adjournment

Adjourned 8:19am.

Ahalya Srikanth

Secretary, IEEE EMC TC-2 (EMC Measurements)