



31 July 2018

Donald N. Heirman
Chair
Don HEIRMAN
Consultants
+1.732.741.7723
+1.732.530.5695 (Fax)
d.heirman@ieee.org

Thomas J. Fagan
Vice Chair
The Aerospace Corp.
+1.571.599.5363
tjfagan@ieee.org

Monrad L. Monsen
Secretary
Oracle
+1.303.272.9612
monrad_monsen@ieee.org

Minutes

Committee: TC-2; Electromagnetic Compatibility (EMC) Measurements
Place: Long Beach Convention Center, Long Beach, CA
Date: 31 July 2018 (Tuesday)
Time: 7:00 to 8:30 AM
Room: Room 103C (Level 1)
Continental breakfast available

1.0 Call to Order/Introductions

Don Heirman opened the meeting at 7:11am. Each participant introduced themselves.

Dave Arnett (M)	Don Heirman (M)	Neda Nourshamsi (M)
Carlo Carobbi (M)	Greg Hiltz (V)	Ghery Pettit (M)
Tom Fagan (M)	Michael Hintzke (V)	Frank Sabath (M)
James Guo (V)	Jeff Klingler (M)	Shirish Shah (M)
Carl Hager (M)	Monrad Monsen (M)	Abtin Spantman (M)
Matt Halligan (V)	Petra-Marian Nicalae (M)	

M = Member

V = Visitor

2.0 Approval of 2018 Minutes from IEEE EMC TC-2 meeting (15 May 2018) in Singapore at the IEEE EMC+SIPI Symposium.

Unanimous approval for the minutes from Singapore.

3.0 TC2 Election Results

The secretary (Monrad Monsen) sent out a request for TC2 officer self-nominations to the TC2 membership on 16 August 2017 with a deadline of 22 August 2017. Only the three current TC2 officers self-nominated. Then a ballot was sent to the membership on 23 August 2017 with a request that votes be sent to Bob Hofmann (a TC2 member that is not on the ballot) for counting with a deadline of 30 August 2017 for submitting a vote. Bob Hofmann reported that the final tally was unanimous to approve the slate of TC2 officers with 11 ballots received out of 18 members (61.1% participation rate). The TC2 officers for the new 3-year term are listed below.

Chair: Don Heirman

Vice Chair: Tom Fagan

Secretary: Monrad Monsen

4.0 Quorum: Robert's Rules of Order gives a default of >50% as a quorum. This is used for EMC Society board level meetings. However, there are no quorum identified at TC or WG levels. None the less the TC officers believe that is it useful to have a quorum defined for TC2 meetings. The TC2 officers propose the following quorum rule.

PROPOSED

TC2 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.

A motion was made and seconded to approve this quorum requirement, and we discussed the motion. At our 31 July 2018 meeting, we have 13 members out of 20 present (65%). Prior to today's meeting, there was no quorum requirement. If this proposal is approved, then we would still meet the minimum 20% requirement for making this decision. We want the quorum requirement to be small enough to be accepted at meetings no matter where in the world or any EMCS event where they are given. A vote was called, and the motion passed by unanimous vote to approve this new quorum requirement.

5.0 Privacy: Personal data will be handled in accordance with the IEEE Privacy Policy which can be found at: <https://www.ieee.org/security-privacy.htm>
There was no objection or comment after the policy was explained.

6.0 Committee Membership Status

6.1 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 2015 and no other. By committee rules, these candidates are not members of TC-2 unless they attend a second face-to-face symposium meeting within a four year period.

All attendees will initial the sign-in roster. Two TC-2 meetings were held this year (one in Singapore on 13 May and another in Long Beach on 31 July). The Singapore meeting is now history. After the Long Beach TC-2 meeting, those that have not attended a face-to-face TC-2 meeting since 2015 will no longer be a TC-2 member but will remain on the list for one additional year to receive meeting announcements. Those that have not attended a face-to-face TC-2 meeting since 2014 will be removed from the membership list. Any of those that are dropped from the membership list can start again heading for membership by attending the requisite number of face to face meetings in the time frame noted above. (See the 2018 membership list which is also the meeting sign-in roster.)

7.0 Current Symposium Activity, July 2018 and May 2018

7.1 May Symposium paper review status (top paper, top TC-2 paper, Round 2 reviewing, etc).
Don reviewed the accomplishments in this area.

7.2 July 2018 Symposium paper review status (top paper, top TC-2 paper, Round 2 reviewing, etc).
Don reviewed the accomplishments in this area.

7.3 July 2018 Symposium Sessions

- 8:30AM-12:00PM, Monday: “Basic EMC Measurements” tutorial, Don Heirman (Chair)
- 3:30PM-5:30PM, Tuesday: “EMC Measurement Techniques – 1”, Ed Hare (Chair), Don Heirman (Co-Chair)
- 8:30AM-12:00AM, Thursday: “Test Facilities and Standards”, Don Heirman (Chair), Ghery Pettit (Co-Chair)
- 2:30PM-5:30PM, Thursday: “EMC Measurement Techniques – 2”, Ross Carlton (Chair), Monrad Monsen and Ahalya Srikanth (Co-Chairs)
- 1:30PM-5:30PM, Friday: “The Role of the IEC Advisory Committee on EMC (ACEC) in Coordinating IEC EMC Activities” tutorial, Don Heirman (Chair)

Don gave a summary of the paper reviewer process. Don asked for people to volunteer to review papers. He has a pool to select from of 40 currently.

ACTION ITEM 2018-1: Monrad will send a request for the resume and biography to the TC2 distribution list emphasizing the subject matter areas that each will be confident reviewing. Deadline is 30 September 2018.

Dave Arnett asks if we should have a session on what we look for in good papers and what are typical solutions to accept papers. Monrad Monsen suggested that we have a panel address best practices for papers; the panel would include those chairs from different TCs as well as experienced reviewers.

ACTION ITEM 2018-2: The TC2 officers (Don) will take this to the TAC meeting on Friday.

ACTION ITEM 2018-3: Don will put together a paper with some of the highlights addressing what we look for in a paper.

8.0 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 is directly applicable

This table shows via the short title and highlighted in yellow those EMCS standards which directly involve measurements and hence TC2 interest. Note that by far the number of standards devoted to measurements is the vast majority.

IEEE Standard	Title	Expiration Date	Status	Chair and Sponsor Contact	Notes	SDECom Priority
Std.139-1988	IEEE Recommended Practice for the Measurement of RF Emission from ISM Equipment on User's Premises	Expires: 12/31/2022	Status: Current standard. Status: Reaffirmed 2012. No active PAR.	Sponsor contact: Ed Hare Past Chair: Daniel Weinberg	No action required.	Low
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	Expires: 12/31/2018	Status: Current standard. Status: Reaffirmed 2008. Being updated. IEEE PAR approved 10/27/2014, expires 12/31/2018.	Chair: David Traver Vice Chair: Mark Arthurs Secretary: Sponsor contact: Ed Hare	100% drafted. In final IEEE edit before publication.	High
Std. 299-2006	IEEE Standard Method for Measuring the Effectiveness of Shielding Enclosures (ANSI Recognized)	Expires: 12/31/2022	Status: Current standard. Status: Reaffirmed 2012. No active PAR.	Sponsor contact: Ed Hare Past Co-Chair: Dale Svetanoff Past Co-Chair: Maria Sarto	No action required.	Low
Std. 299.1-2013	IEEE Standard Method for Measuring the Shielding Effectiveness of Enclosures and Boxes Having Dimensions Between 0.1 and 2m	Expires: 12/31/2023	Status: Current standard. No active PAR.	Sponsor contact: Ed Hare Past Chair: Maria Sarto	No action required.	Low
Project 370	Electrical Characterization of Printed Circuit Board and Related Interconnects at Frequencies up to 50 GHz	New project	Status: Drafting in progress. IEEE PAR approved 6/11/2015, expires 12/31/2019.	Chair: Xiaoning Ye Vice Chair: Sam Connor Vice Chair: Brice Achkir Secretary: Alistair Duffy	60 members. 20 meetings in last year. 80% drafted. Work in progress on target.	Medium
Std. 377-1980	IEEE Recommended Practice on the Measurement of Spurious Emissions from Land-Mobile Comm. Transmitters (ANSI Recognized)	Expires: 12/31/2018	Status: Current standard. No active PAR.	Chair: Larry Cohen Sponsor contact: Ed Hare Past Chair: Joseph Koepfinger	Needs revision. SDECom formed a study group to look for best ways to update standard.	Low
Project 473	Recommended Practice for an Electromagnetic Site Survey (10 kHz to 40 GHz)	Withdrawn New project	Status: Withdrawn 2005 In progress. IEEE PAR approved 6/30/2016, expires 12/31/2020.	Chair: Chad Kiger Sponsor contact: Ed Hare	5 members. 3 meetings in last year. Draft is 60% complete. Parallel development with C63.24,	High
Std. 475-2000	Measurement Procedure for Field Disturbance Sensors, 300 MHz to 40 GHz (ANSI Recognized)	Expires: 12/31/2022	Status: Current standard. Reaffirmed 2012. No active PAR.	Past Chair: Hugh Denny Sponsor contact: Ed Hare	No action required. TC7 is preparing a PAR to consider using some of this material in a standards document that would address measurements of near-field radiation below 400kHz.	Medium
Std. 1128-1998	IEEE Recommended Practice for RF Absorber Evaluation in the Range of 30 MHz to 5 GHz	Expires: 12/31/2022	Status: Current standard Reaffirmed 2012	Past Chair: Jose Perini Sponsor contact: Ed Hare	No action required. Group met 7/30/2018 and discussed extending the scope range up to 18GHz.	Medium
Std. 1140-1994	Test Procedures for the Measurement of Electric and Magnetic Fields from Video Display Terminals from 5 Hz to 400 kHz	Expires: 12/31/2016	Status: Current standard Reaffirmed 2006.	Past Chair: Dheena Moongilhan Sponsor contact: Ed Hare	TC7 preparing a PAR that could use some of this material for near-field measurements <400kHz.	Low

Std. 1302-2008 Project 1302	Guide for the Electromagnetic Characterization of Conductive Gaskets in the Frequency Range of DC to 40 GHz	Expires: 12/31/2018	Status: Current standard. Status: Revision in progress. IEEE PAR approved 3/27/2014, expires 12/31/2018.	Chair: Davy Pissoot Vice Chair: Secretary: Sponsor contact: Ed Hare	30 members. 2 meetings in the last year. Draft complete and in final WG editorial review. Will be provided to SDECom for MEC December 2017.	Low
Std. 1309-2013	Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9 kHz to 40 GHz	Expires: 12/31/2023	Status: Current standard. No active PAR.	Past Chair: Zhong Chen Sponsor contact: Ed Hare	No action required.	Low
Std. 1560-2013	Methods of Measurement of Radio Frequency Interference Filter Suppression Capability in the Range of 100 Hz to 10 GHz	Expires: 12/31/2023	Status: Current standard. No active PAR.	Past Chair: Kermit Phipps Sponsor contact: Ed Hare	No action required.	Low
Std. 1597.1-2008 Project 1597.1	Standard for validation of CEM Computer Modeling (CEM) and Simulation	Expires: 12/31/2018	Status: Current standard. Status: Revision in progress. IEEE PAR approved 12/5/2015, expires 12/31/2019.	Chair: Alistair Duffy Vice Chair: Secretary: Sponsor contact: Ed Hare	25 members. 1 meeting in the last year. Will be submitted for ballot by the end of May 2018.	Low
Std. 1597.2-2010	Recommended Practice for Computational Electromagnetics (CEM) Computer Modeling and Simulation Applications	Expires: 12/31/2020	Status: Current standard. No active PAR.	Past Chair: Andy Drozd Sponsor contact: Ed Hare	No action required.	Low
Std. 1642-2015	Recommended Practice for Protecting Public Accessible Computer Systems from Intentional EMI	Expires: 12/31/2025	Status: Current standard. No active PAR.	Past Chair: Bill Radasky Sponsor contact: Ed Hare	No action required.	Low
Std. 1688-2016	Standard for Module Electromagnetic Interference (EMI) Testing	Expires: 12/31/2026	Status: Current standard. No active PAR.	Past Chair: Fred Heather Sponsor contact: Ed Hare	No action required.	Low
Project 1848	Techniques & Measures to Manage Risks With Regard to Electromagnetic Disturbances	New project	Status: In progress. IEEE PAR approved 2/5/2016, expires 12/31/2020.	Chair: Keith Armstrong Vice Chair: Alistair Duffy Secretary: Niklas Briest	31 members. 1 meeting in the last year. Draft sent to IEEE for ballot.	Low
Project 1897	Resolution of Power-Line Gap-Noise Reports	New project	Status: In progress. IEEE PAR approved 9/22/2016, expires 12/31/2020.	Chair: Mike Gruber Vice Chair: Brian Cramer Secretary: Jerry Ramie	15 members. 8 meetings in the last year. Draft is 90% complete. Work in progress on target.	Low
Project 2425	Standard for Electromagnetic Compatibility Testing of Electrical and Instrumentation and Control Equipment at Nuclear Power Generating Stations and Other Nuclear Facilities	New project	Status: In progress Sponsor: Nuclear Power Engineering Committee (PE/NPE) Co-sponsor: EMC Society SDECom IEEE PAR approved 4/12/2016, expires 12/31/2020.	Chair: Suresh Channarasappa Vice Chair: Secretary: Sponsor contact: Co-Sponsor contact: Ed Hare	12 members. 2 meetings in the last year. No recent report received.	Medium
Project 2710	Electromagnetic Shielding Performance of Enclosures for Portable Electronic Devices	New project	Status: In progress. IEEE PAR approved 2/5/2016, expires 12/31/2020.	Chair: Alistair Duffy Vice Chair: Secretary:	10 members. 1 meeting in the last year. Draft is 0% complete. Work in progress on target.	Medium
Project 2715	Guide for the Characterization of the Shielding Effectiveness of Planar Materials	New project	Status: In progress. IEEE PAR approved 6/30/2016, expires 12/31/2020.	Chair: Alpesh Bhoje Vice Chair: Davy Pissoot Secretary: Yoeri Arien	Work in progress on target. Round robin testing in progress.	Medium
Project 2716	Guide for the Characterization of the Effectiveness of Printed Circuit Board Level Shielding	New project	Status: In progress. IEEE PAR approved 2/17/2017, expires 12/31/2021.	Chair: Davy Pissoot Vice Chair: Andy Marvin Secretary: Yoeri Arien	18 members. 1 meeting in last year. Work in progress on target.	Low

Project 2717	Low Level Intermodulation	New project	Status: Forming WG. IEEE PAR approved 2/17/2017, expires 12/31/2021.	Chair: Yihong Qi		Low
Project 2718	Nearfield Emissions	New project	Status: Forming WG. IEEE PAR approved 2/17/2017, expires 12/31/2021.	Chair: Dave Thomas		Low

Additional details available at the below web address.

New: <http://www.emcs.org/status-of-emc-standards.html> (Not yet updated. Format is tough to read.)

Old: http://www.emcs.org/standards/sdecom/Standards_Matrix.html (Up to date. Better format.)

9.0 iNARTE Exam Question Review Activity

Update needed as present information is that the questions were reviewed by 2 to 3 experts and not individual TCs.

Discussed. Much more progress needed.

10.0 Future Symposium Activity

10.1 Future topics for IEEE conferences in New Orleans, LA, on 19-26 July 2019.

For EMC Measurements, we will base the sessions on what papers are submitted. We usually have a variety of paper topics submitted. We will also continue our tutorial on basic EMC measurements.

Detectors for EMC high power immunity threats combined session between TC2 (EMC Measurements) and TC5 (High Power Electromagnetics).

ACTION ITEM 2018-4: Frank Sabath will coordinate this combined forum between TC2 and TC5.

Ghery Pettit will coordinate an “ask the experts” session for the EMC Symposium in 2020 which should have a TC2 representative.

ACTION ITEM 2018-5: Ghery Pettit will coordinate an “ask the experts” session for the EMC Symposium in 2020.

10.2 Technical Program Responsibilities and session chair reminders

If you would like to be on the paper review committee, please let Don know what your areas of expertise are so he can consider sending appropriate papers to you for review. We assign at least three people review each paper. Generally 4 to 5 are assigned since one or two reviewers might not respond.

10.3 2019 Paper Review Deadlines (New Orleans)

Preliminary full paper manuscript is due by 6 January 2019.

Acceptance notification will be issued by 16 February 2019.

Final paper is due 19 April 2019.

10.4 Paper reviewers

TC2 members are welcome to be paper reviewers. Don has a reviewer list from the past. But there is always need for reviewers that are needed for paper topics for which there is no reviewer particularly expert in that subject.

10.5 Need session chairs and co-chairs

TC2 will not know the number of sessions until papers are accepted for New Orleans. Don will then select session chairs from among the reviewer pool.

10.6 New membership

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

10.7 New areas of interest

Anything in our charter to include measurement uncertainty.

The above mention of “measurement uncertainty” led to Monrad proposing a change to the charter under 10.8 (Any other business).

10.8 Any other business?

Monrad Monsen proposed that the TC2 Charter be updated to add “measurement uncertainty”. With discussion, the following charter update was proposed (added text in purple font).

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**.

This charter modification was moved, seconded, and approved by unanimous vote. This charter revision will be sent to the TAC for their review.

11.0 Set meeting and agenda for next meeting(s)

11.1 New Orleans, LA, Tuesday, July 23, 2019. This date will be confirmed later.

12.0 Adjournment

Don Heirman adjourned the meeting at 8:46am.

Monrad L. Monsen

Secretary, IEEE EMC TC-2 (EMC Measurements)