Agenda

Committee: TC-2; Electromagnetic Compatibility (EMC) Measurements
Place: Virtual on Webex
Date: 7 August 2020 (Friday)
Time: 1:00 to 2:30 PM Central Daylight Time (CDT)

1.0 Call to Order/Introductions

1.1 Quorum Check: 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.

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 (23 Jul 2019) in New Orleans at the IEEE EMC+SIPI 2019 Symposium.

3.0 TC2 Election Announcement
Our last TC2 election was held by email 16-27 August 2017. The next elections will be held this fall 2020 with the officer term transition occurring 1 January 2021. Don Heirman (our chair) has chosen to not stand for re-election. The remaining current officers have put their names in for the officer progression (Tom Fagan as new chair and Monrad Monsen as new vice-chair), so the secretary position is open. Members may place their name on the ballot any of these offices (chairman, vice-chairman or secretary), but we especially need a self-nomination for the secretary position.

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 TC2 minutes will have list
attendee names unless you contact the TC2 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 TC2 related notifications/communications. 

*Note: Because this meeting is entirely virtual, the secretary (Monrad) will note the attendance from the Webex. First-time attendees are encouraged to send the secretary an email (monrad_monsen@ieee.org) your name, company and email address so you will be on the distribution list for future TC2 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 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. After the August 2020 virtual TC-2 meeting, those that have not attended a face-to-face TC-2 meeting since 2017 will no longer a TC-2 member but will remain on the list for one additional year (2021) to receive meeting announcements. Those that have not attended a face-to-face TC-2 meeting since 2016 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 face-to-face meetings in the time frame noted above.

6.0 Current Symposium Activity, July 2019

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: 19
- 1st round number accepted or accepted with optional comments/changes: 7
- 1st round number requiring mandatory changes: 7
- 1st round number rejected: 5
- 2nd round number submitted: 19
- 2nd round number accepted: 12
- 2nd round number rejected: 5
- Actually presented (not withdrawn): 13
- Note: We submitted two papers for the top paper.

6.1.2 ABSTRACT REVIEW PAPERS

- 1st round number submitted: 5
- Actually presented (not withdrawn): 2

6.1.3 Special Program (APEMC, Sydney, Australia)

- Actually presented (not withdrawn): 2
6.2 Symposium Sessions sponsored by TC2 as shown in the final program. TC2 is to be congratulated for sponsoring or participating in the five sessions/tutorials listed below.

- 8:30AM-12:00PM, Tuesday (8/4/2020): “Smart Grid Support and EMC Issues” tutorial session, 4 presentations, Jerry Ramie and Monrad Monsen (Co-Chairs)
- 1:00PM-4:15PM, Tuesday (8/4/2020): “Emissions and Reverberation Chambers” technical session, 6 presentations, Tom Fagan (Chair)
- 8:30AM-12:00PM, Thursday (8/6/2020): “Basic EMC Measurements” tutorial session, 4 presentations, Monrad Monsen (Chair)
- 1:00PM-4:45PM, Tuesday (8/18/2020): “EMC Standards Topics” technical session, 7 presentations, Monrad Monsen (Chair)
- 1:00PM-3:00PM, Tuesday (8/20/2020): “Antenna, Cable, Filter and Sensor Design Evaluation” technical session, 4 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 TC2 (EMC Measurements). 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.

<table>
<thead>
<tr>
<th>IEEE Standard</th>
<th>Title</th>
<th>Standard Expiration Date</th>
<th>Status</th>
<th>Chair and Sponsor Contact</th>
<th>PAR</th>
<th>Tech Comm</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Std. 139-1988</td>
<td>Recommended Practice for the Measurement of RF Emission from ISM Equipment on User’s Premises</td>
<td>Expires: 12/31/2022</td>
<td>Current Standard</td>
<td>Past Chair: Daniel Weinberg</td>
<td>No active PAR</td>
<td>TC2</td>
<td>No maintenance underway. SDECom will consider revision (minor or major) 2020 Symposium meeting.</td>
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<td>Std. 299-2006</td>
<td>Standard Method for Measuring the Effectiveness of Shielding Enclosures (ANSI Recognized) (More information)</td>
<td>Expires: 12/31/2022</td>
<td>Current standard</td>
<td>Past Co-Chair: Dale Svetanoff</td>
<td>Past Co-Chair: Maria Sarto</td>
<td>Sponsor contact: Ed Hare</td>
<td>No active PAR</td>
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<tr>
<td>Std. 299.1-2013</td>
<td>Standard Method for Measuring the Shielding Effectiveness of Enclosures and Boxes Having Dimensions Between 0.1 and 2m (More information)</td>
<td>Expires: 12/31/2023</td>
<td>Current Standard</td>
<td>Past Chair: Maria Sarto</td>
<td>Sponsor contact: Ed Hare</td>
<td>No active PAR</td>
<td>No maintenance underway. SDECom will consider revision (minor or major) 2020 Symposium meeting.</td>
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<tr>
<td>Project 370</td>
<td>Electrical Characterization of Printed Circuit Board and Related Interconnects at Frequencies up to 50 GHz (More information)</td>
<td>New project</td>
<td>Draft approve to send to ballot 7 April 2019</td>
<td>Chair: Xiaoning Ye</td>
<td>Vice Chair: Sam Connor</td>
<td>Vice Chair: Brice Achkir</td>
<td>Secretary: Alistair Duffy</td>
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<tr>
<td>Project 473</td>
<td>Recommended Practice for an Electromagnetic Site Survey (10 kHz to 40 GHz) (More information)</td>
<td>Expired: 12/31/2006</td>
<td>New project</td>
<td>Revision in progress</td>
<td>Chair: Chad Kiger</td>
<td>Vice Chair: Secretary:</td>
<td>IEEE PAR Expires: 12/31/2020</td>
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<td>Std. 475-2000</td>
<td>Measurement Procedure for Field Disturbance Sensors, 300 MHz to 40 GHz (ANSI Recognized) (More information)</td>
<td>Expires: 12/31/2022</td>
<td>Current standard</td>
<td>Past Chair: Hugh Denny</td>
<td>Sponsor contact: Ed Hare</td>
<td>No active PAR</td>
<td>No maintenance underway, but there is interest in having the frequency range extended below 300 MHz. A Chair and participation is being sought.</td>
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<tr>
<td>Std.</td>
<td>Description</td>
<td>Expires</td>
<td>Current standard</td>
<td>Chair/Contact</td>
<td>IEEE PAR Expires</td>
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<td>1560-2013</td>
<td>Methods of Measurement of Radio Frequency Interference Filter Suppression Capability in the Range of 100 Hz to 10 GHz</td>
<td>12/31/2023</td>
<td>Current standard</td>
<td>Past Chair: Kermit Phipps, Sponsor contact: Ed Hare</td>
<td>No active PAR</td>
<td>No maintenance underway.</td>
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<tr>
<td>1597.1-2008</td>
<td>Standard for CEM Computer Modeling (CEM) and Simulation (More information)</td>
<td>12/31/2018</td>
<td>Current standard</td>
<td>Chair: Alistair Duffy, Vice Chair: Andy Drozd, Secretary: John Tengden</td>
<td>IEEE PAR Expires: 12/31/2019</td>
<td>The Standard is administratively withdrawn and revisions are behind schedule. Needs increased priority and oversight.</td>
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<td>1597.2-2010</td>
<td>Recommended Practice for Computational Electromagnetics (CEM) Computer Modeling and Simulation Applications (More information)</td>
<td>12/31/2020</td>
<td>Current standard</td>
<td>Past Chair: Andy Drozd, Sponsor contact: Ed Hare</td>
<td>No active PAR</td>
<td>No maintenance underway.</td>
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<td>P1613</td>
<td>Standard for Environmental and Testing Requirements for Devices with Communications Functions in Electric Transmission and Distribution Facilities.</td>
<td>12/31/2019</td>
<td>Current standard</td>
<td>Chair: John Tengden</td>
<td>No active PAR</td>
<td>Co sponsored with Power and Energy</td>
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<tr>
<td>1642-2015</td>
<td>Recommended Practice for Protecting Public Accessible</td>
<td>12/31/2025</td>
<td>Current Standard</td>
<td>Past Chair: Bill Radasky, Sponsor contact: Ed Hare</td>
<td>No active PAR</td>
<td>No maintenance underway.</td>
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<tr>
<td>Project 1897</td>
<td>Resolution of Power-Line Gap-Noise Reports</td>
<td>New project</td>
<td>Drafting in progress</td>
<td>Chair: Mike Gruber</td>
<td>IEEE PAR Approved: 9/22/2016 Expires: 12/31/2020</td>
<td>Work in progress on target</td>
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<tr>
<td>Project 2665</td>
<td>Recommended Practice for Statistical Process Control for EMC Test Laboratories</td>
<td>New Project</td>
<td>Drafting in progress</td>
<td>Chair: Kimball Williams</td>
<td>IEEE PAR Approved: 12/6/2017 Expires: 12/31/2021</td>
<td>Work in progress on target</td>
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<tr>
<td>Project 2710</td>
<td>Electromagnetic Shielding Performance of Enclosures for Portable Electronic Devices</td>
<td>New project</td>
<td>Drafting in progress</td>
<td>Chair: Alistair Duffy</td>
<td>IEEE PAR Approved: 2/5/2016 Expires: 12/31/2020</td>
<td>Work in progress, but market changes are resulting in need for additional text and techniques.</td>
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### Printed Circuit Board Level Shielding

- **Vice Chair:** Andy
- **Marvin Secretary:** Yoen Arien
- **Expires:** 12/31/2020
- Round robin testing in progress.

#### Project 2717
- **Passive Intermodulation Test Methods for Wireless Systems in Low Noise Environments**
- **Drafting in progress**
- **Chair:** Leo Liu
- **Vice Chair:** Thomas
- **Secretary:** Yoeri Arien
- IEEE PAR Approved: 2/17/2017
- Expires: 12/31/2021
- Work in progress, on target.

#### Project 2718
- **Guide for Near Field Characterization of Unintentional Stochastic Radiators**
- **Drafting in progress**
- **Chair:** Dave Thomas
- **Vice Chair:** Yoeri Arien
- **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**
- **Drafting in progress**
- **Chair:** Fred Heather
- **Vice Chair:** Dave
- **Secretary:** Yoeri Arien
- IEEE PAR Approved: 11/7/2019
- 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**
- **Working Group getting organized**
- **Chair:** Huadong Li
- **Vice Chair:** Yoeri Arien
- **Secretary:** IEEE PAR Approved: 3/5/2020
- 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**
- **Various**
- **N/A**
- EMC Society seeking co-sponsorship of these standards as they come up for revision.

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#### 8.0 iNARTE Exam Question Review Activity

#### 9.0 Future Symposium Activity

9.1 Future topics for the IEEE EMC+SIPI 2021 symposium in Raleigh, NC, USA, on 30 April - 6 May 2021 and for the IEEE International EMC+SIPI 2021 symposium in Glasgow, Scotland on 30 July - 6 August 2021.

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 2020 Paper Review Deadlines (Raleigh)

Proposed papers (full papers) due by 19 October 2020.

9.4 2020 Paper Review Deadlines (Glasgow)
We do not yet have the schedule for Glasgow, but the due dates will likely be 2 months after the above dates reported for Raleigh.

9.5 Paper reviewers
TC2 members are welcome to be paper reviewers. Don’s reviewer list from the past is not available, so Tom and Monrad are creating a replacement list. 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.

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

9.7 New areas of interest
In discussion, suggestions included adding more presentations on military standards, shielding effectiveness, and calibration of test instrumentation. Don wants to organize a tutorial on setting up measurement equipment instrumentation. Ghery Pettit offered to assist Don with drawings using his Visio software.
ACTION ITEM 2019-3: Monrad Monsen will contact Darryl Ray to add these topics to the EMC Symposium 2020 Call for Papers.
ACTION ITEM 2019-4: Don Heirman will organize tutorial on setting up measurement equipment instrumentation.

10.0 Any other business?

11.0 Action Items
11.1 ACTION ITEM 2018-2: Session on what we look for in good papers and what are best practices for papers. The TC2 officers (Don) will take this to the TAC meeting on Friday.
23 July 2019: No traction in the TAC meeting on this issue, but they concurred with the paper option. Perhaps with a paper published in 2019, we might setup a WebEx session for reviewer team prior to our TC2 Reno meeting in 2020. {OPEN}

11.2 ACTION ITEM 2018-3: Don will put together a paper with some of the highlights addressing what we look for in a paper.
23 July 2019: Don commits to work on this action for next time. {OPEN}

11.3 ACTION ITEM 2018-4: Detectors for EMC high power immunity threats combined session between TC2 (EMC Measurements) and TC5 (High Power Electromagnetics). Frank Sabath will coordinate this combined forum between TC2 and TC5.
23 July 2019: Frank was unable to come to New Orleans and did not provide an update. {OPEN}

11.4 ACTION ITEM 2018-5: Ghery Pettit will coordinate an “ask the experts” session for the EMC Symposium in 2020.
23 July 2019: Ghery will work on identifying experts to support the “ask the experts” session during this New Orleans symposium. {OPEN}

11.5 ACTION ITEM 2019-1: Don Heirman will contact iNARTE to figure out the process for TC-2 to review EMC measurement related questions.

11.6 ACTION ITEM 2019-2: Monrad Monsen will circulate the PAR.

The author submitted the PAR separately. They do not need to go through TCs and SCs but can go directly to the Standards Committee. {CLOSED}

12.0 Set meeting and agenda for next meeting(s)
12.1 Raleigh, North Carolina, USA, Tuesday, May 4, 2021
12.2 Glasgow, Scotland, Tuesday, August 3, 2021 (likely virtual)

13.0 Adjournment

Monrad L. Monsen
Secretary, IEEE EMC TC-2 (EMC Measurements)