

Join Us for the Next Meeting of the IEEE P1848 Working Group!

August 24, 2020

The IEEE P1848 Working Group will meet on-line, provisionally booked for August 24, 08:30-11:30 Central USA Time, as part of the 2020 IEEE International Virtual Symposium on EMC+SIPI.

One discussion will be on creating an industry/application-specific version of IEEE 1848, and so far, we have had interest in NATO/military; Machinery; Railways; Avionics; Automotive, and Medical. Other possibilities include Process Industry, Nuclear, and more.

Like all Technical Committee and Standards Working Group meetings, this meeting is open to everyone, including IEEE non-members. Meeting attendees are required to register for the Symposium via <https://www.emc2020virtual.emcss.org/> and at least "purchase" a Guest Pass for \$0.00.

incapable of being verified or validated by EMC immunity testing alone – no matter how much the test levels are increased!

IEEE 1848 is a new type of IEEE Standard that provides requirements and guidance on how to deal with this modern safety engineering issue. It has just been approved for full publication, but some editing must be done first so for now we only have the draft, at: <https://standards.ieee.org/project/1848.html>.

Briefly:

- 1) Even when a modern digital system passes all its EMC tests, this cannot prove that it is Functionally Safe as regards EMI
- 2) There are so many digital states in a modern digital system, that testing them all – even once – is impossible

- 3) EMC testing requires hundreds of tests, so testing to prove that EMI can't cause safety problems, is even more impossible
- 4) Digital systems are non-linear, so even if we could prove by testing that, say, 99% of their digital states were safe (which we can't), we could not assume that the 1% untested states would also be safe
- 5) Functional Safety risks that can be caused by EMI can be managed and reduced using a set of well-proven practical techniques and measures, called: 'Electromagnetic Resilience'
- 6) The new IEEE Standard 1848:2020 describes how to apply Electromagnetic Resilience in practical detail

The well-proven techniques and measures in IEEE 1848:2020 cover the following lifecycle stages:

- Project management
- System design
- Operational design of hardware and software Design verification
- Design validation
- Assembly/installation
- Commissioning
- Maintenance
- Upgrade and refurbishment disposal

Although intended for reducing Functional Safety risks, the techniques and measures in IEEE 1848 can also be used for reducing any quantifiable risks (mission-critical, reputational, financial, etc.) that could be caused by electromagnetic disturbances or EMI.

For further information, I recommend reading the early-access article that has just been published in the June 2020 IEEE Letters on EMC Practice and Applications (L-EMCPA): <https://ieeexplore.ieee.org/document/9113675>, and the article in the EMC Magazine (Vol 5, Qtr 1, 2016) <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7477140>.

EMC



SDECom Meeting Report

By Ross Carlton, SDECom Chair

The Standards Development and Education Committee (SDECom) has not held a formal meeting since February 2020; however, I can update you on a few items that may be of interest.

SDECom currently sponsors 14 active projects with the IEEE Standards Association (IEEE-SA). Information about our standards and standards projects can be found at the IEEE-SA website at <https://standards.ieee.org>. Working Groups are open to anyone to participate. For almost all SDECom-sponsored projects, neither IEEE nor IEEE-SA membership is required to participate. Please join us if you are interested.

• New projects looking for members:

- P2855 "Recommended Practice for the Electromagnetic Characterization of Cable/Connector Assembly Shielding Effectiveness in Frequency Range of Direct Current to 40 GHz". This project was recently approved in March 2020. The working group chair is Huadong Li. We are seeking interested parties to participate.
- P2838 "Standard for Aircraft Component Lightning Strike Direct Effects Qualification". This project was recently approved in November 2019. The working group chair is Fred Heather. We are seeking interested parties to participate.

• New standards nearing publication:

- P1848 “Techniques and Measures to Manage Functional Safety and Other Risks with Regard to Electromagnetic Disturbances” has successfully completed balloting and is approved for publication. The standard is now in final editing with publication expected within the next few months. See accompanying article by Working Group chair Keith Armstrong for more information on this exciting news!
- P370 “Electrical Characterization of Printed Circuit Board and Related Interconnects at Frequencies up to 50 GHz” has resolved all comments received from its initial ballot. The draft will be recirculated for comment before it can proceed to publication. Publication is expected before the end of 2020.

SDECom, in its role as the EMC Society's standards sponsor, represents the EMC Society on the ANSI C63 committee. SDECom's representatives to ANSI C63, Dr. John Norgard and Mr. Henry Benitez, ensure that the position of the EMC Society is considered when drafting C63 standards. SDECom has recently acted on the following tasks:

- Approving a new research project within WG ANSI C63.26 “Procedures for Compliance Testing of Licensed Transmitters” for a Massive-MIMO Test Distance Study.
- Commenting and voting on the draft of ANSI C63.24 “Recommended Practice for In Situ RF Immunity Evaluation of Electronic Devices and Systems”.

- Approving a new PINS (project initiation form) for ANSI C63.9 “Standard for Laboratory Immunity Testing of Office Equipment Exposed to RF Sources”.

Also during this period, SDECom has facilitated connecting the Power & Energy Society with our High-Power Electromagnetics experts in TC5, specifically Bill Radasky, and our Smart Grid experts, represented by Jerry Ramie, to assist the PES Power System Relaying and Control Committee (PSRCC) in authoring a white paper on EMP protection. The PSRCC is preparing this white paper in response to the recent USA Executive Order regarding EMP Protection. Over the course of several meetings, Dr. Radasky provided the PSRCC with an initial draft on which to base their white paper. We look forward to working with the PSRCC on the final product.

The next meeting of SDECom will be held virtually during the upcoming 2020 IEEE International Symposium on EMC+SIPI. The dates are still under consideration. Check the SDECom website as below and the 2020 Symposium program at <https://www.emc2020virtual.emcss.org/> for details. SDECom meetings are open to the public so that any interested person may attend using a free guest pass.

Meeting announcements, agendas, minutes, status of EMC standards, and other documentation are open to all and available at the SDECom website <https://www.emcs.org/development-and-education.html>.

Please feel free to contact me at ross.carlton@ieee.org if you have any questions or interest in participating in SDECom activities. **EMC**

Attend the Technical Committee, Working Group, and Continuity Group Meetings during the 2020 IEEE Virtual Symposium on EMC+SIPI

The following meetings are planned to date - anyone interested is welcome to attend virtually. You do not need to be an IEEE member. Just register for a guest pass at no charge! These meetings will be held over August 3-28. Please check the schedule for the confirmed date and time for the meeting that interests you. Registration and schedule information is available at www.emc2020virtual.emcss.org

TECHNICAL COMMITTEES

- TC 1 EMC Management
- TC 2 EMC Measurements
- TC 3 Electromagnetic Environment
- TC 4 Electromagnetic Interference Control
- TC 5 High Power Electromagnetics
- TC 8 Aeronautics and Space EMC
- TC 9 Computational Electromagnetics
- TC 10 Signal and Power Integrity
- TC 11 Nanotechnology and Advanced Materials
- TC 12 EMC for Emerging Wireless Technologies

IBIS Summit

STANDARDS WORKING GROUPS

- P370 Characterization of PC Boards and Interconnects to 50 GHz
- P473 Site Survey
- P1128 RF Absorber
- P1848 Manage EM Disturbance Risks
- P1897 Power-line Interference Resolution
- P2665 Statistical Process Control for EMC
- P2710 EM Shielding for Portable Electronic Devices
- P2838 Aircraft Component Lightning Strike Direct Effects Qualification
- P2885 EM Characterization of Cables and Connectors

STANDARDS CONTINUITY GROUPS

Shielding Maintenance • Intentional EMI • Computational EMC