

TC-5: High Power Electromagnetics
Annual Meeting at the 2011 IEEE International Symposium on EMC at Long Beach, CA
Wednesday, August 17, 2011

Draft Minutes

1. Opening of the meeting

Chairman Dr. William (Bill) Radasky brought the meeting to order at 12:14 PM. Chairman Radasky welcomed the attendees, reviewed the agenda and asked for suggested changes; none were offered. The following items were discussed.

2. Minutes

Secretary Dr. William Price reviewed the minutes of the 2010 meeting in Fort Lauderdale, Fl. No corrections were offered. Mr. Fred Heather made a motion that the minutes be approved as read. MSC.

3. TC-5 membership list

All attendees introduced themselves. The Secretary circulated a roster, a summary of which is attached.

4. Technical papers

Dr. Radasky reported that 23 papers were submitted of which 18 were accepted. There were 16 oral papers accepted, 8 of which addressed Information Leakage. Two poster papers were accepted.

5. Workshop on "Addition of ESD and Lightning Requirements and Testing to MIL-STD-461"

The workshop, organized by Mr. Fred Heather and Mr. Manny Rodriguez attracted about 75 participants. Mr. Travis Flanagan shared results of testing to the new requirements; Mr. Edward Rupke discussed test equipment needed for those tests. Dr. David Pommerenke lectured on ESD; Mr. Jeff Donohue discussed ESD troubleshooting. A panel session fielded questions from the audience.

Dr. Radasky that in addition to the changes mentioned above, MIL-STD-464 now includes an HPM environment.

6. In-progress report on “EMC in Space” Special Session (R. Perez and J. Lukash)

Neither Dr. Reinaldo Perez nor Mr. James Lukash were present for the meeting because the special session was to commence at 1:30 PM, but Dr. Radasky reported that 20 papers had been submitted to the special session on EMC in Space and covered a wide variety of subjects.

7. Report from the Lightning Subcommittee (F. Rachidi)

Dr. Farhad Rachidi was unable to attend the meeting. He has had to resign his appointment as chair of the Lightning Subcommittee but has suggested a replacement (see agenda item 10). He reported that in 2010 and 2011 the *IEEE Trans. EMC* published 34 papers on lightning discharge observations, modeling, LEMP and induced effects, and lightning protection.

The most significant lightning events for 2011 and 2012 are

- 2011 International Conference on Lightning and Static Electricity (Oxford, England, September 6-8, 2011). <http://www.icolse.org/>
- 11th International Symposium on Lightning Protection SIPDA (Fortaleza, Brazil, October 3-7, 2011). <http://ws9.iee.usp.br/scripts/sipdaxi/main.asp?site=home>
- 7th Asia-Pacific International Conference on Lightning (Chengdu, China, November 1-4, 2011). <http://www.apl2011.org/>
- EUROEM Meeting (Toulouse, France, July 2-6, 2012) <http://www.euroem.org>
- 31th International Conference on Lightning Protection ICLP (Vienna, Austria, September, 2012) <http://www.aldis.at/iclp2012/>

Dr. Rachidi noted the following lightning activities within CIGRE

- Working Group C4.407 “Lightning Current Parameters for Engineering Application” (Convener: Vladimir Rakov)
- Working Group C4.408 “Lightning Protection of LV Lines” (Convener: Alexandre Piantini)
- Working Group C4.409 “Lightning Protection of Wind Turbines Blades” (Convener: Shigeru Yokoyama)
- Working Group C4.410 “Lightning Striking Characteristics for Very High Structures” (Convener: Takatoshi Shindo)

8. Report from the EM Information Leakage Subcommittee (Y. Hayashi)

Prof. Yuichi Hayashi presented a report for the Information Leakage subcommittee. The scope of the subcommittee includes measurement and analysis techniques, modeling, simulation, evaluation and verification, propagation mechanisms, and countermeasure technologies. Drs. Tetsuya Tominaga and William Radasky will chair two technical sessions this week on Information Leakage. The subcommittee

is also involved in standards activity through the ITU, specifically with K.84, "Test methods and guide against information leaks through unintentional EM emissions."

Past activities include an organized session on Information System Security at the 2009 IEICE International Symposium on Electromagnetic Compatibility, Kyoto, and a special session on EM Information Leakage at the 2010 IEEE International Symposium on Electromagnetic Compatibility, Fort Lauderdale.

Prof. Hayashi suggested that TC-5 request and recommend either a special section or a special issue of the *Transactions* on Electromagnetic Information Security for 2012. After discussion the motion was seconded and confirmed. Dr. Radasky will recommend such to the editor.

9. Report from the IEMI Subcommittee (F. Sabath)

Dr. Sabath was unable to attend the committee meeting but did recommend a tutorial during the 2012 IEEE International Symposium on Electromagnetic Compatibility on IEMI. Dr. Radasky suggested the committee sponsor a special session rather than a tutorial.

10. Nomination and election of a new Chair for the Lightning Subcommittee (All)

Prof. Rachidi has suggested Dr. Marcos Rubenstein to chair the Lightning subcommittee. After discussion Dr. Radasky moved that Dr. Rubenstein chair the subcommittee on Lightning. MSC.

11. Status of the IEMI standard practice activities (W. Radasky)

Dr. Radasky reported P1642, "Recommended Practice for Protecting Public Accessible Computer Systems from IEMI," was to have gone to ballot. The Standards Committee had forwarded it to the IEEE but it was subsequently lost. It should appear for voting in the next month or two.

12. Status of the Special Issue on HEMP (W. Radasky)

The upcoming special issue of the *Transactions* on HEMP will focus on critical, civilian infrastructure. Dr. Radasky expects about 20 papers to summarize national efforts to address the HEMP threat to the infrastructure as well as to highlight significant scientific advances such as testing critical infrastructure equipment. The special issue is targeted for publication in August 2012, but may move to February 2013.

13. Status of the TC-5 web page (M. McInerney)

Mr. Michael McInerney displayed the committee's web page (<http://www.ewh.ieee.org/soc/emcs/committees/tc05/index.html>) and asked for comment and input. Dr. Radasky thanked him for keeping the site updated.

14. Review of HPEM activities since last TC-5 meeting (W. Radasky)

Dr. Radasky reported the following HPEM activities in the past year.

- September 2010, Sydney. International Conference on Electromagnetics in Advanced Applications hosted a session on Intentional EMI chaired by Dr. Carl Baum.
- October 2010, Chicago. Dr. Radasky briefed the IEEE EMC Society's Chicago chapter on HPEM threats.
- November 2010, Hamburg. 1st European Workshop on Intentional Electromagnetic Interference (IEMI).
- December 2, 2010, Albuquerque. Dr. Carl Baum passed away. He will be missed.
- January 2011, London. IEC subcommittee 77C held a project meeting and is developing a new test standard for IEMI.
- April 2011, Recife. CIGRE working group on IEMI.
- May 2011, Jeju Island, Korea. The Asia-Pacific EMC Symposium hosted a special session on IEMI and HEMP chaired by Dr. Radasky and Prof. Siniy.
- July 2011, Spokane. The IEEE International Symposium on Antennas and Propagation hosted a special session on HPEM.
- August 2011, Istanbul. The 30th URSI General Assembly and Scientific Symposium meets this week and will host a special session on IEMI.

Dr. Radasky mentioned the following future HPEM activities.

- May 2012, Singapore. The Asia-Pacific EMC Symposium will hold a special session on IEMI and HEMP threats, interaction, protection, and standards.
- August 2012, Toulouse. The European Conference and Exhibition on Electromagnetics (EUROEM) will host a special session on HPEM and IEMI
- August 2012, Pittsburgh. The IEEE Symposium on Electromagnetic Compatibility will host a special session on HPEM or IEMI.

Dr. Radasky mentioned that in the 112th Congress Representative Franks of Arizona and others introduced a bill (the "SHIELD Act") "[t]o amend the Federal Power Act to protect the bulk-power system and electric infrastructure critical to the defense and well-being of the United States against natural and manmade electromagnetic pulse ("EMP") threats and vulnerabilities." It is a notable piece of legislation in response to the previous "Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack" of 2004. Dr. Radasky urged members of the committee to familiarize themselves with both the report and the bill and follow the latter's progress.

15. Discussion concerning whether a tutorial, workshop, and/or special session should be organized for next year (All)

There was a general discussion of the committee about tutorials, workshops, and special sessions for next year's EMC symposium. The *Transactions* editor, Dr. Heyno Garbe, pointed out that while special sessions target researchers, tutorials target practitioners. With that in mind, Mr. Fred Heather suggested a tutorial on new requirements targeted for MIL-STD-461. Another committee member proposed a tutorial session on ESD. Dr. Radasky suggested a special session on IEMI.

16. Other business (All)

Mr. Michael McInerney recommended that the committee appoint vice chairpersons to all subcommittees who may stand in for the chairperson in the event of absence, or succeed them upon resignation.

17. Adjournment (All)

Dr. William Price offered a motion of adjournment at 1:34 PM. MSC.

Attendees

Name	Affiliation
Dr. Mats Bäckström	Saab Aerospace, Sweden
Mr. Gavin Barber	QinetiQ
Mr. William Bush	Consultant
Mr. Marty Czuba	Dayton T Brown
Ms. Melanie Deperschmidt	Leibniz University, Hannover
Mr. Richard Do	Anritsu
Mr. Oliver Döring	Leibniz University, Hannover
Mr. David Duffy	Anritsu
Mr. Jay Ely	NASA Langley
Mr. Paul Emery	Retired, Raytheon SAS
Prof. Heyno Garbe	Leibniz University, Hannover
Mr. Michael Hatfield	US Navy
Dr. Yu-ichi Hayashi	Tohoku University
Mr. Fred Heather	NAVAIR
Mr. Nathan Hortoon	The Boeing Company
Mr. Randy J. Jost	Ball Aerospace
Mr. Masahiro Kinugawa	Tohoku University
Dr. Galen Koepke	NIST
Mr. Peter Landgren	Talken Data
Mr. Mike McInerney	USACE-ERDC
Mr. Olivier Meynard	Telecom-ParisTech
Mr. Ross Myrehn	Raytheon RMS
Prof. Petre-Marian Nicolae	University of Craiova, Romania
Dr. Magnus Olofsson	Elforsk AB
Dr. William Price	Boeing
Mr. Mike Prussel	EMC Analytical Services
Dr. Bill Radasky	Metatech Corp.
Mr. Laurent Sauvage	Telecom-ParisTech
Dr. Edward Savage	Metatech Corp.
Mr. Walter Scott	TASC, Inc.
Prof. Hidenori Sekiguchi	Osaka University
Dr. Tetsuya Tominaga	NTT Energy & Environment Lab
Prof. Xing Chang Wei	Zhejiang University, China
Dr. Perry Wilson	NIST-EM Div.
Prof. Qun Wu	Harbin Institute of Technology, China
Prof. Qiubo Ye	Communications Research Centre Canada
Prof. Wen-Yan Yin	Zhejiang University, China