



ICES

International Committee on Electromagnetic Safety

Approved Minutes
ICES TC95 Meeting
Town and Country Resort and Convention Center
500 Hotel Circle North
San Diego, CA 92108
Sunday, 8 June 2008
9:00 AM – 1:00 PM

1. Call to Order:

Chairman Chou called the meeting to order at 0905 h. Each of the attendees introduced him/herself (see Attachment 1 for list of attendees).

2. Approval of Agenda:

Following a motion by D'Andrea and a second by Cohen, the agenda was approved without modification (see Attachment 2 for approved agenda).

3. Approval of November 30, 2007 Minutes:

Following a motion by Varanelli and a second by Murphy, the minutes of the November 2007 meeting were approved without modification.

4. Chairman's Report:

a) TC95

Chou welcomed Dr. Cañedo, Chairman of the Mexican Society of Bioelectromagnetism and briefly explained the origin and purpose of the Society—to promote scientific study of the interaction of electromagnetic energy and acoustic energy with biological systems. Chou then reported that Subcommittees 3 and 4 met earlier in the week – Subcommittees 1, 2 and 5 did not meet here in San Diego. He explained that as soon as Amendment 1 to C95.1-2005 is approved, a new Project Authorization Request (PAR) will be submitted for the revision of C95.1-2005, which will be combined with C95.6 resulting in a single C95.1 standard that covers the frequency range extending from 0 Hz to 300 GHz. He also explained how important it is for TC95 to get information to the public and noted that a reporter from a Norwegian television station, NKRD, attended the subcommittee meetings and is preparing a program that will explain the work of TC95, ICNIRP and other organizations that address radiofrequency safety.

b) ICES AdCom

ICES Chairman Bodemann reported on the activities of the ICES AdCom. He explained that one goal of the AdCom is to broaden the membership of the technical committees and subcommittees. He explained that TC34 (product safety) has been reorganized; two of the subcommittees, SC1 (pleasure craft radar) and SC3 (effectiveness of RF protective clothing) were disbanded because of a general lack of interest. Now SC1 addresses SAR certification using experimental techniques; SC2 addresses SAR certification using numerical techniques. He noted that although the intent is to merge C95.1 and C95.6, the two subcommittees, i.e., SC3 and SC4 will remain separate subcommittees but will work together, especially in the region where effects associated with electrostimulation and effects associated with heating overlap. Bodemann also reported that he will represent ICES at the WHO International Advisory Committee meeting scheduled to be held in Berlin, 19-20 June 2008. He said that he is also a member of the EU Working Party on EMF. The working party is focusing attention on the EC Directive to adopt the ICNIRP guidelines in the workplace, which has been postponed until 2012 because of MRI compliance issues and other issues that must first be addressed.

5. Executive Secretary's Report

Petersen provided a brief history of ICES and an update on the status of the C95 standards (see Attachment 3). He said that the new ICES Policies and Procedures were accepted by the IEEE Standards Association Standards Board (SASB) in December 2007 and the 2007-2008 Annual Report is on the SASB consent agenda for the June meeting. He noted that the four standards submitted for reaffirmation last year have either been reaffirmed or are on the SASB June agenda for approval. He concluded by noting that the extension request for PC95.3.1 (low frequency measurement and computation) was approved for 2 years (until December 2009) and the PAR for C95.1a is on the SASB consent agenda for the June meeting.

6. Treasurer's Report:

Varanelli presented the Treasurer's report (see Attachment 4). He noted that ICES is a non-profit self-supporting organization. The major expense the past year has been for website development. ICES now has its own website and domain name: <http://www.ices-emfsafety.org/index.php5>. He reminded everyone that they should send him any articles, reports or information that they feel would be of interest to the membership and/or the public and he will have them posted on the ICES website. In response to a question by Anderson, Varanelli explained that any articles sent for posting should be free of copyright restriction, and they should be relevant. They will be reviewed by the ICES AdCom before posting. He also reminded the members once again that they should send a short biography, less than 300 words, and a photograph for posting. He explained that the ICES website has pages open to the public and private pages open only to members of TC95 and its subcommittees. The public pages include items such as approved meeting minutes, meeting announcements and registration materials, links to other relevant sites; the private pages include unapproved meeting minutes, drafts, etc.

Varanelli explained that this is the first time PayPal was used to transfer registration fees for those whose organizations do not allow 3rd party credit card payment. He said it is cost-effective, and those who chose that option do not have to have a PayPal membership. He reviewed the recurring costs, e.g., \$35/month for the ICES merchant bank account. He noted that because of the recurring charges, including maintenance of the website, registration fees for future meeting will probably not decrease.

7. Membership Chairman's Report:

Murphy presented the Membership Chairman's report (see Attachment 5). He welcomed the new members (slide 2) noting the evolving international representation on the committees. He then reviewed the membership of the ICES AdCom, TC34 and TC95. He noted that TC34 was recently re-organized and the membership is in a state of flux. He explained what information is needed by the Membership Committee for prospective members and reviewed some of the questions that the AdCom addressing regarding maintaining membership. He suggested a number of ways that TC34 and TC95 members could advertise the work and importance of ICES activities. He described the ICES brochure, which has been made available at a number of international meetings but needs to be updated because of the many recent changes. In response to a question about requirements for voting on IEEE standards at the sponsor (TC95) level, Petersen explained that any IEEE SA member can vote on any IEEE standard. IEEE recognizes that members of many committees have contributing members who are not IEEE members and because of their discipline and interests have no reason to join the IEEE or the SA. These committee members can be approved by the SASB as "Invited Experts," Petersen said, but the SASB will no longer approve as Invited Experts IEEE members who are not SA members. Murphy concluded by reviewing a list of upcoming meetings of importance, noting that the next BEMS meeting will be held in June 2009 in Davos, Switzerland. He then introduced the invited speakers.

8. Invited Speakers:

a) Update on DoD and NATO Standardization Activities

Klaenberg began his presentation by discussing the importance of standards (see Attachment 6) and the current efforts to update the NATO RF safety standard agreement, STANAG 2345. Ideally, instead of revising the current STANAG and including the MPEs and basic restrictions in the revision, NATO would rather adopt an appropriate consensus standard by reference, e.g., C95.1-2005. For this to happen, however, such standards would have to be publicly available without cost, e.g., available on the web. A briefing with IEEE staff in January to try to have C95.1, C95.6 and possibly C95.7 made publicly available documents led to a proposal for a licensing agreement at a cost of more than \$100,000 for lifetime access to these standards, which was unacceptable to DoD. There was no support from the other federal agencies either, e.g., NTIA.

Klaenberg explained that although not a voluntary standard developed through an open consensus process, the ICNIRP Guidelines, which are publicly available, could be referenced by NATO, but the EU/EC Directive that delays their implementation in the workplace until 2012 because of compliance issues with certain MRI procedures presents a problem. He said that until this issue is resolved, NATO is at an impasse and is now exploring alternate means for moving forward. One approach is to identify a standards developing organization (SDOs) that would agree to develop and maintain a publicly available standard that NATO could adopt by reference. He said that a Market Survey is being sent to a number of SDOs including IEC, CENELEC and ANSI. Klaenberg said that he attended exploratory meetings with CENELEC TC106X to discuss their interest as a possible transition partner, but the outcome was unsuccessful because TC106X cannot develop exposure limits, nor can IEC TC106X. He concluded by stating that IEEE ICES is perfectly situated to develop and maintain the NATO STANAG and the IEEE will be included in the Market Survey.

b) An Overview of Ongoing Research at the AFRF RFR Branch

Dr. Bennett Ibey of the Air Force Research Laboratory Radio Frequency Radiation Branch gave a presentation on the work being carried out by his organization. This included an overview of the mission, scientific foundation, core direction, etc., of the RFR Branch (see Attachment 7). He described the mathematical approaches directed toward defining the interaction of RF energy with biological systems, the work being carried out in the field of dosimetry, and the ultra-short pulse work. He noted that some of this research is being conducted to better understand interaction mechanisms and bioeffects in order to develop more rational bases for the corresponding MPEs. He showed a short video clip of the work being conducted by Pakhomov, et al. on effects related to exposure of a single cell to 12 kV/cm 60 ns pulses (see Attachment 8). He also discussed the work being done at THz frequencies including dosimetry and bioeffects and described the research challenges. He concluded by discussing the work being carried out in the field of molecular biology. In response to a question from Chou, Ibey noted that most applications of THz technology are in industry, security, etc. McQuade noted that there could be a possibility of applying the technology to devices useful for detecting atomic, biological and chemical devices and improvised explosive devices.

9. Reports from the Subcommittees:

a) SC1 (Measurements and computations)

Petersen reported that SC1 did not meet here in San Diego. Instead, the SC1 chairman, Howard Bassen, decided to hold a meeting later in the summer to resolve open issues so that an SC balloting draft of PC95.3.1 (Recommended Practice for Measurements and Computations of Human Exposure to Electric and Magnetic Fields, 0 – 100 kHz) could be finished before year's end. He noted there are still a few open issues regarding appropriate metrics for exposure to randomly polarized or pulsed magnetic fields and a few sections on numerical techniques have to be completed.

b) SC2 (RF warning symbols, hazard communications and work practices)

No report.

c) SC3 (Safety levels, 0 – 3 kHz)

Chadwick reported that SC3 met Friday afternoon. He noted that SC3 is still looking for a permanent secretary and thanked Ken Gettman for filling in. He noted that C95.6-2002 was reaffirmed by the IEEE SASB in December 2007 and the document will serve as a stable basis for merging C95.1 and C95.6 into a single standard (see Attachment 9). He discussed a number of issues including modelling, the bases for *in situ* thresholds, electric field limits and the challenges in moving forward with merging the two standards.

d) SC4 (Safety levels, 3 kHz – 300 GHz)

Co-chairman Thansandote reported that SC4 met yesterday. A number of issues were discussed including the status of the literature surveillance program, the initial activity of the Literature Surveillance Working Group chaired by J Morrissey. An update of the issue on temperature versus peak spatial average SAR, and the ceiling limits for induced and contact currents were also discussed. With respect to the latter, various aspects were discussed by Klauenberg, Anderson and Reilly. Thansandote said that this was followed by the review of the draft amendment PC95.1a, which establishes ceiling limits for induced and contact current, clarifies distinctions between localized exposure and spatial peak power density, and corrects other known errors in C95.1-2005. The draft amendment was completed, which he said was a major achievement, and will soon be balloted by SC4 and TC95. After approval, the draft will be submitted to the IEEE SASB

for their consideration. The comments on C95.1-2005 that were submitted previously by Harrington following publication were also reviewed. Harrington will be asked to incorporate and highlight these comments into C95.1 for discussion at the next meeting.

e) SC5 (Safe distances from antennas when using electric blasting caps)

Needy reported SC5 did not meet here in San Diego. He said that C95.4-2002 was reaffirmed at the March SASB meeting and he foresees no major issues, i.e., the standard is stable. He is considering holding a meeting in December.

10. ICES Website:

The ICES website was discussed earlier (see Item 6). In response to a question from Sheppard, Varanelli responded that the website could serve as an ICES newsletter if there was enough interest and enough interesting material was submitted by the members. Chou noted that the approved minutes of the TC 95 and some of the subcommittees are posted on the public part of the website, which describes our activities.

11. New Business:

Dr. Luis Cañedo, Chairman of the Mexican Society of Bioelectromagnetism briefly explained the origin and purpose of the Society (see Attachment 10). He said that the growing interest in bioelectromagnetics in Mexico over the past decade led to the formation of this new society, the purpose of which is to promote scientific study of electromagnetic energy and acoustic energy with biological systems, inform the public, and develop standards for Mexico.

12. Plans for Future Meetings:

Chou reported that the next TC95 meetings will be held at the Motorola facility in Plantation FL. The dates are 2 – 4 December 2008.

13. Adjournment:

There being no further business, following a motion by Varanelli and a second by van Rongen, the meeting was adjourned at 1115 h.

Attendance Sheet
TC95 Meeting
8 June 2008
Towne and Country Resort, San Diego, CA

	Last Name	First Name	Affiliation	Status	E-mail
1.	Anderson	Vitas	Swinburne University of Technology	M	vitasanderson@swin.edu.au
2.	Barnes	Frank	University of Colorado	O	frank.barnes@colorado.edu
3.	Black	David	Environmental Physician	M	drblack@itmedical.com
4.	Bodemann	Ralf	Siemens AG	M	ralf.bodemann@siemens.com
5.	Bushberg	Jerrold	U. of California, Davis	M	jtbushberg@ucdavis.edu
6.	Cañedo	Luis	Mexican Society of Bioelectromagnetism	O	lcanedo@holosproy.com
7.	Chadwick	Philip	EMFields Ltd	M	phil.chadwick@emfields.com
8.	Chou	C.K.	Motorola Labs	M	ck.chou@motorola.com
9.	Cleveland	Robert	EMF Consulting	M	rfcleveland@gmail.com
10.	Cohen	Jules	Independent Consultant	M	jules.cohen@ieee.org
11.	Croft	Rodney	Aus Cntr for RF Bioeffects Research	O	rcroft@swin.edu.au
12.	D'Andrea	John	Naval Health Research Ctr.	M	john.dandrea@navy.brooks.af.mil
13.	DeFrank	John	USACHPPM	M	john.defrank@us.army.mil
14.	Durrenberger	Gregor	ETH	M	gregor@ifh.ee.ethz.ch

	Last Name	First Name	Affiliation		E-mail
15.	Elder	Joe	Motorola	O	joe.elder@motorola.com
16.	Erdreich	Linda	Exponent	M	lerdreich@exponent.com
17.	Gallant	Josette	Industry Canada	O	gallant.josette@ic.gc.ca
18.	Gettman	Ken	National Electrical Manufacturers Assoc.	M	Ken_gettman@nema.org
19.	Ibey	Bennett	Air Force Research Labs	M	bennett.ibey@brooks.af.mil
20.	Ikehata	Masateru	Railway Technical Research Institute	M	ikehata@rtri.or.jp
21.	Jaffa	Kent	Pacificorp (Retired)	M	pesolutions@comcast.net
22.	Klauenberg	B. Jon	USAF	M	betram.klauenberg@us.af.mil
23.	Lang	Sakari	Nokia Corp-Stand & Ind Rel	M	sakari.lang@nokia.com
24.	Lathrop	Janet	Gateway Information Services	O	jlathrop@rs-inc.com
25.	McKenzie	Ray	Telstra, Chief Technology Office	O	ray.mckenzie@team.telstra.com
26.	McQuade	Jill	USAF	M	jill.mcquade@usafa.edu
27.	Mikulski	Tim	US Army Safety Office	O	timothy.mikulski@hqda.army.mil
28.	Morrissey	Joe	Motorola	O	ejm037@email.mot.com
29.	Murphy	Michael	Directed Energy Bioeffects	M	michael.murphy@brooks.af.mil
30.	Needy	Robert	Naval Surface Warfare Ctr.	M	robert.needy@navy.mil
31.	Packer	Malcolm	Harris RF Communications	M	mpacker@harris.com

	Last Name	First Name	Affiliation		E-mail
32.	Petersen	Ronald	R C Petersen Associates	M	r.c.petersen@ieee.org
33.	Portelli	Lucas	University of Colorado	O	portelli@colorado.edu
34.	Roberts	Brad	US Army CHPPM	M	brad.roberts@us.army.mil
35.	Sheppard	Asher	Asher Sheppard Consulting	M	ashersheppardconsulting@verizon.net
36.	Swicord	Mays	Consultant	M	mays.swicord@comcast.net
37.	Testagrossa	Paul	Alcatel-Lucent	M	ptestagrossa@alcatel-lucent.com
38.	Thansandote	Art	Health Canada	M	art_thansandote@hc-sc.gc.ca
39.	Umbdenstock	Don	Sensormatic	O	djumbdenstock@tycoint.com
40.	van Rongen	Eric	Health Council of the Netherlands	M	e.van.rongen@gr.nl
41.	Varanelli	Arthur	Independent Consultant	M	avaranelli@comcast.net
42.	Weller	Robert	FCC	O	bob@weller.org
43.	Wuart	Joe	France Telecom Orange Labs R&D	M	joe.wuart@francetelecom.com
44.	Wong	Man Fai	France Telecom Orange Labs R&D	O	Manfai.wong@orange-ftgroup.com
45.	Ziriaux	John	Naval Health and Research Center	M	john.ziriaux@brroks.af.mil

Approved Agenda
ICES TC95 Meeting
Town and Country Resort and Convention Center
500 Hotel Circle North
San Diego, CA 92108
Sunday, 8 June 2008
9:00 AM – 1:00 PM

- | | |
|---|-------------------------|
| 1. Call to Order: | <i>Chou</i> |
| 2. Approval of Agenda: | <i>Chou</i> |
| 3. Approval of December November 30, 2007 Minutes: | <i>Chou</i> |
| 4. Chairman's Report: | |
| a) TC95 | <i>Chou</i> |
| b) ICES AdCom | <i>Bodemann</i> |
| 5. Executive Secretary's Report | <i>Petersen</i> |
| 6. Treasurer's Report: | <i>Varanelli</i> |
| 7. Membership Chairman's Report: | <i>Murphy</i> |
| 8. Invited Speakers | |
| a) Update on DoD and NATO Standardization Activities | <i>Klauenberg</i> |
| b) An Overview of Ongoing Research at the Air Force
Research Laboratory Radio Frequency Radiation Branch | <i>Dr. Bennett Ibey</i> |
| 9. Reports from the Subcommittees: | <i>Chou</i> |
| 10. ICES Website: | <i>Varanelli</i> |
| 11. New Business: | <i>Chou</i> |
| 12. Plans for Future Meetings: | <i>Chou</i> |
| 13. Adjournment: | <i>Chou</i> |



ICES

Attachment 3

International Committee on Electromagnetic Safety

Secretary's Report

**8 June 2008 Towne and Country
Resort**

San Diego, CA

R Petersen



ICES –Administrative

Policies and Procedures:

- Defines new organizational structure (SCC-39)
- Based on “SA Model Procedures” but with deviations
- Accepted by SASB Audit Committee, June 2007
- Valid through December 2012

Annual Report (2007-2008)

- On SASB June 12, 2008 Consent Agenda

ICES TC95 Standards: Status

Reaffirmations:

- **C95.3-2002:** (RF measurements and computation: 100 kHz to 300 GHz)
 - ❖ Reaffirmation: (**On June 12, 2008 SASB Agenda**)
 - ❖ Revision will incorporate C95.3.1 and 1460
- **C95.4-2002:** (Safe distance from antennas during blasting operations)
 - ❖ Reaffirmation: (**Approved at the March 2008 SASB Meeting**)
- **C95.6-2002:** (Safety levels – 0 to 3 kHz)
 - ❖ Reaffirmation: (**Approved at the December 2007 SASB Meeting**)
- **1460-1996:** (Measurement of quasi-static electric and magnetic fields)
 - ❖ Reaffirmation: (**On June 12, 2008 SASB Agenda**)



ICES TC95 Standards: Status

Project Authorization Requests (PARs)

- **PC95.3.1** “Draft Recommended Practice for Measurements and Computation of Electric, Magnetic and Electromagnetic Fields With Respect to Human Exposure to Such Fields, 0 - 100 kHz” (**Approved by the SASB December 2007 for 2 years**)
- **PC95.1a** “**C95.1-1005**: Amendment 1 (**On June 11 2008 NesCom Agenda**)

Standards requiring action in 2010:

- **C95.1-2005**: (Safety levels, 3 kHz – 300 GHz)
- **C95.2-1999 (R 2005)**: (RF energy and current flow symbols)
- **C95.7-2005**: (RF safety programs)

Attachment 4

IEEE/ICES
Treasurer's
Report
8-Jun-08

1/1/2008	\$14,364.75	Balance
	-\$4,640.00	Web Site Development Costs
7/7/2008	-\$247.55	Credit Card Merchant Account Costs
San Diego	TBD	Credit Card Costs Merchant Account
San Diego	TBD	PayPal Costs
7/7/2008	\$9,695.20	Present balance
7/8/2008	\$6,950.00	Gross San Diego Registration Income
7/8/2008	-\$4,000.00	Estimated San Diego Costs: Refreshments and Audio Visual Services
7/8/2008	\$12,645.20	Estimated Balance Pending: TBD Credit Card Processing Costs



Attachment 5

ICES Membership Report 8 June 2008, San Diego, CA

Dr. Michael R. Murphy
Science Director
Directed Energy Bioeffects
Air Force Research Laboratory



ICES Membership Report Outline



- **New Member Applicants**
 - TC95
 - TC34
- **The ICES ADCOM**
- **Membership Application Form?**
- **New Members**
 - The ICES Brochure
- **Upcoming Meeting**



Recent Applicants for Membership in ICES TC95



Title: MEMBERSHIP RECORD

Dr Selcuk Comlekci, Turkey - accepted

Dr George Filippopoulos, Athens, Greece - accepted

Nazaruddin Abd. Rahman, Malaysia - accepted

Dr. Wan Nor Liza Mahadi, Malaysia - accepted

Dr. Robert Thomas, Brooks City-Base, TX - accepted

Dr. Jill McQuade, Air Force Academy - accepted

Dr. Bennett Ibey, Brooks City-Base, TX - accepted

Kavet, Bob - accepted



Recent Applicants for Membership in ICES TC34



Title: MEMBERSHIP RECORD
Bit-Babik, Giorgi - accepted
Kuster, Niels - accepted
Balzano, Q. - accepted
Bate, Ian - accepted
Vogel, Martin - accepted
Qiubo, Ye - accepted
Lu, Lin - awaiting resume
Forrester, John - - awaiting resume



The ICES ADCOM - 2008



The ICES ADCOM reviews and votes on acceptance of applicants for membership in ICES TC95 and TC34.

The ICES Administrative Committee:

Chairman: Dr. Ralf Bodemann
ralf.bodemann@siemens.com

Vice Chairman: Kenneth Gettman
ken_gettman@mema.org

Secretary: Ron Petersen
r.c.petersen@ieee.org

Treasurer: Arthur G. Varanelli
a.g.varanelli@ieee.org

Membership Dr. Michael R. Murphy
michael.murphy@brooks.af.mil

Chairman TC34: Dr. Wolfgang Kainz
wolfgang.kainz@fda.hhs.gov

Chairman TC 95: Dr. C-K Chou
ck.chou@motorola.com

IEEE Staff: William Ash
w.ash@ieee.org

At Large Members

Dr. Eleanor Adair
adair@hepmail.physics.yale.edu

Dr. Sheila Johnston
sjohnston@btclick.com

Dr. Tom McManus
mcmanustom@eircom.net

Dr. John Osepchuk
jmosepchuk@comcast.net



Membership Application Form for ICES TC95 or TC34



A. For which areas of ICES is membership sought:

- 1. TC34?**
- 2. TC95?**
- 3. Both?**

B. Submit a resume, including a list relevant publications.

C. Declare your status in each of the following three areas:

(1) Interest Category: (required by IEEE)

- (a) User**
- (b) Producer**
- (c) General Interest**

(2) Affiliation:

- **(a) Name of affiliation**
- (b) Business, e.g., "academia", "government", "industry", "consulting", "research", "other".**

(3) Primary Discipline: "medical", "life scientist", "physical scientist", "engineer", "public policy", "other".



Listed as Members of TC95 (1)



FIRST_NAME	MI	LAST_NAME
Eleanor	R.	Adair
Max	J	Ammann
Vitas		Anderson
Bill		Ash
Quirino		Balzano
David		Baron
Howard		Bassen
John		Bavin
Pascale		Bellier
John	A.	Bergeron
David	R	Black
Dennis	W.	Blick
Ralf		Bodemann
Aviva		Brecher
Ian		Brooker
Jerrold	T.	Bushberg
Jim		Cassata
Philip		Chadwick
Huai		Chiang
Stephen		Chiusano

C.K.		
Robert	F.	Chou
Roger	W.	Cleveland
Jules		Coghill
Robert	A.	Cohen
John	A.	Curtis
Linda		D'Andrea
John	J.	de Jager
David		DeFrank
Guglielmo		Dini
Thanh		d'Inzeo
Gregor		Dovan
Leon		Durrenberger
Linda	S.	DuToit
Kenneth	R.	Erdreich
Peter		Foster
Om	P.	Gajsek
Robert	C.	Gandhi
Kurt		Gardner
David	L.	Geber
		George



Listed as Members of TC95 (2)



Ken		Gettman
Martino		Grandolfo
Arthur	W.	Guy
Donald	L.	Haes, Jr.
Konstantinos		Halkiotis
Ed		Hare
James	B	Hatfield
Donald	N.	Heirman
Paul		Heroux
Jeff	L	Holley
Masateru		Ikehata
Michel		Israel
Veronica		Ivans
Kent	C.	Jaffa
Sheila		Johnston
Ken	H.	Joyner
Shaiela		Kandel
Efthymios		Karabetsos
Ray		Kemp
Nam		Kim

B. Jon		Klaunenberg
George	A.	Koban
Joseph	L.	Koepfinger
Niels		Kuster
Sakari		Lang
Dariusz		Leszczynski
James	C.	Lin
C.J.		Maletskos
Nisakorn		Manatrakul
Michael		Manning
Patrick	A.	Mason
Stewart		Maurer
Tom		McManus
James	P.	McNamee
Martin	L.	Meltz
Noel	D.	Montgomery
Michael	R.	Moore
Amitabha		Mukhopadhyaya
Michael	R.	Murphy
Robert		Needy



Listed as Members of TC95 (3)



David		Nelson
Kwan-Hoong		Ng
John	M.	Osepchuk
Malcolm		Packer
Andrei	G.	Pakhomov
William	F.	Paul
Bertil	R.	Persson
Ronald	C.	Petersen
Paolo		Ravazzani
J. Patrick		Reilly
Michael	H.	Repacholi
Pat		Roach
Brad	J.	Roberts
Ervin	D.	Root
Theodoros		Samaras
Veli	A	Santomaa
William	G.	Scanlon
Asher	R.	Sheppard

Jon	H	Sirugo
Mays	L.	Swicord
Stanislaw		Szmigielski
Rosa	M	Tang, MD
John		Tattersall
Richard	A.	Tell
Paul	A	Testagrossa
Art		Thansandote
Gyorgy		Thuroczy
Tammy		Utteridge
Eric		van Rongen
Arthur	G.	Varanelli
Femme-Michelle		Wagenaar
Joe		Wiar
Louis	A.	Williams, Jr.
Done-Sik		Yoo
Donald	W.	Zipse
John		Zirix
Marvin	C.	Ziskin, MD



Listed as Members of TC34



FIRST_NAME	MIDDLE	LAST_NAME	STATUS
Eleanor	R.	Adair	A
Bill		Ash	A
Tadeusz	M.	Babij	A
David		Baron	A
Howard		Bassen	A
Brian		Beard	A
Clark	H	Bell	A
Philip		Chadwick	A
Kwok	W	Chan	A
Isaac	A	Chang	A
C.K.		Chou	A
Robert	F.	Cleveland	A
Robert	A.	Curtis	A
David		Dini	A
Mark	G.	Douglas	A
Kenneth	R.	Foster	A
Om	P.	Gandhi	A

Arthur	W	Guy	A
Ed		Hare	A
Ken	H.	Joyner	A
Wolfgang		Kainz	A
Nam		Kim	A
Niels		Kuster	A
Kathy		MacLean	A
Patrick	A.	Mason	A
John	M.	Osepchuk	A
Ronald	C.	Petersen	A
Veli	A	Santomaa	A
William	G.	Scanlon	A
Richard	A.	Tell	A
Art		Thansand	A
Anssi		Toropaine	A
Arthur	G.	Varanelli	A



New Members



- **How do we “advertise” the opportunity to contribute to the work of ICES?**
- **Communication with coworkers**
- **At relevant meetings**
 - **Pass out procures**
 - **Presentations/posters on EMF standards or specifically on ICES**
 - e.g., as has been done by Bodemann, Murphy, Chou, ...
- **Publications on ICES**
 - e.g., Osepchuk and Petersen
- **Further enhancement of ICES website**



ICES Brochure April 2008

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ICES Subcommittees & Chairs:

Technical Committee 95

- SC1: Techniques, Procedures, and Instrumentation
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- SC2: Terminology, Units of Measurements, and Hazard Communication
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- SC3: Safety Levels with Respect to Human Exposure, 0-3 kHz
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- SC4: Safety Levels with Respect to Human Exposure, 3 kHz-300 GHz
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- SC5: Safety Levels with Respect to Electro-Explosive Devices
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Technical Committee 34

- SC1: Small Boat Radar
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- SC2: Wireless Handset Certification
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Dr. Mark Douglas
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- SC3: RF Protective Garments
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- Vice Chairman: Kenneth Gettman
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How to Join ICES

All are welcome to participate in the meetings and deliberations of ICES and to vote and participate fully on the Subcommittees. To apply for voting membership on ICES, send a request with your resume to:

Dr. Michael R. Murphy
ICES Membership Committee Chair
michael.murphy@brooks.af.mil

For further information about ICES, its activities and publications, contact any member of the Administrative Committee or Chair(s) of any subcommittee.

Visit our websites at:

<http://www.ices-emfsafety.org>
<http://group.ieee.org/groups/scc34/sc2>



INTERNATIONAL
COMMITTEE on
ELECTROMAGNETIC
SAFETY



ICES

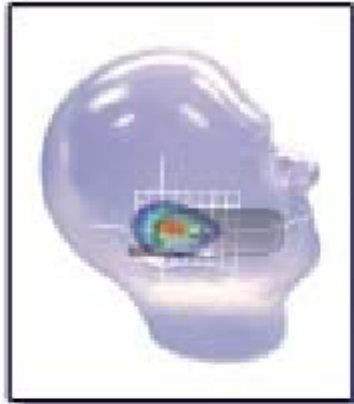
Safety Standards

for

Electromagnetic Fields



SCIENCE



Specific Anthropomorphic Mannequin (SAM) Phantom (From IEEE Std 1528™)

IEEE Safety Standards for EM Fields

With roots dating back to 1884, the IEEE is today the world's largest technical professional society, with more than 365,000 members in over 150 countries. The development of internationally recognized voluntary standards, through an open consensus process, has long been a major effort of the IEEE. In 1960, IEEE co-sponsored the first US radio frequency (RF) safety standards project (C95); the first RF safety standard (C95.1) was published in 1966. Later, C95.1-1982 was the first national standard in which field limits were derived from the frequency-dependent dosimetric quantity *specific absorption rate* (SAR). Dosimetry and a threshold SAR of 4 W/kg are now the bases for most of the world's RF safety standards and guidelines, including those of ICNIRP, NATO, NRPB and the US DoD. IEEE standards are "living" documents that continue to be refined through the worldwide volunteer efforts of stakeholders for the safe use of electromagnetic energy.

SAFETY

ICES Purpose & Process

Today, operating under the strict rules and oversight of the IEEE Standards Association Standards Board, the International Committee on Electromagnetic Safety (ICES) is responsible for *development of standards for the safe use of electromagnetic energy in the range of 0 Hz to 300 GHz relative to the potential hazards of exposure of humans, volatile materials, and explosive devices to such energy; standards for products that emit electromagnetic energy by design or as a by-product of their operation; and standards for environmental limits.* ICES follows an open consensus process, with a balance of disciplines and a balanced representation from the medical, scientific, engineering, industrial, government, and military communities. As of 31 August 2005, membership of the central governing and the technical committees (TC95 and TC34) stands at more than 150 professionals representing 26 countries. ICES strives to achieve consensus among all the stakeholders in the safe use of electromagnetic energy, thereby producing practical standards that are readily accepted and applied.

IEEE Standards C95.6-2002 and C95.1-2005

IEEE Standards C95.6-2002 (Reaffirmed 2007) and C95.1-2005 provide basic restrictions and maximum permissible exposure values to protect against established adverse effects in humans from exposure to electric, magnetic and electromagnetic fields at frequencies from 0 to 3 kHz (C95.6) and 3 kHz to 300 GHz (C95.1). The basic restrictions are based on thresholds for *established* effects and interaction mechanisms, with an adequate margin of safety, and include *in situ* electric field strength for the region where effects associated with electrostimulation predominate, specific absorption rate (SAR) for the region where tissue and whole-body heating predominate, and incident power density for the region where surface heating predominates. Maximum permissible exposure values derived from the basic restrictions, expressed in terms of incident electric and magnetic field strength, incident power density, and induced and contact current, are also provided. These recommendations are based on the results of a comprehensive review of the relevant scientific literature and evaluation of the weight of the scientific evidence. The basic restrictions and maximum permissible exposure values are intended to apply to all human exposures except for exposure of patients by, or under the direction of, physicians and medical professionals.

SERVICE



Other ICES Standards

TC95 Standards

C95.2-1999: "IEEE Standard for Radio-Frequency Energy and Current Flow Symbols" (Reaffirmed in 2005)

C95.3-2002: "IEEE Recommended Practice for Measurements & Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to such Fields, 100 kHz to 300 GHz"

C95.4-2002 (Reaffirmed 2008): "IEEE Recommended Practice for Determining Safe Distances from Radio Frequency Transmitting Antennas when Using Electric Blasting Caps"

C95.7 -2005: "IEEE Recommended Practice for Radio Frequency Safety Programs."

TC34 Standards

1528-2003: "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques"



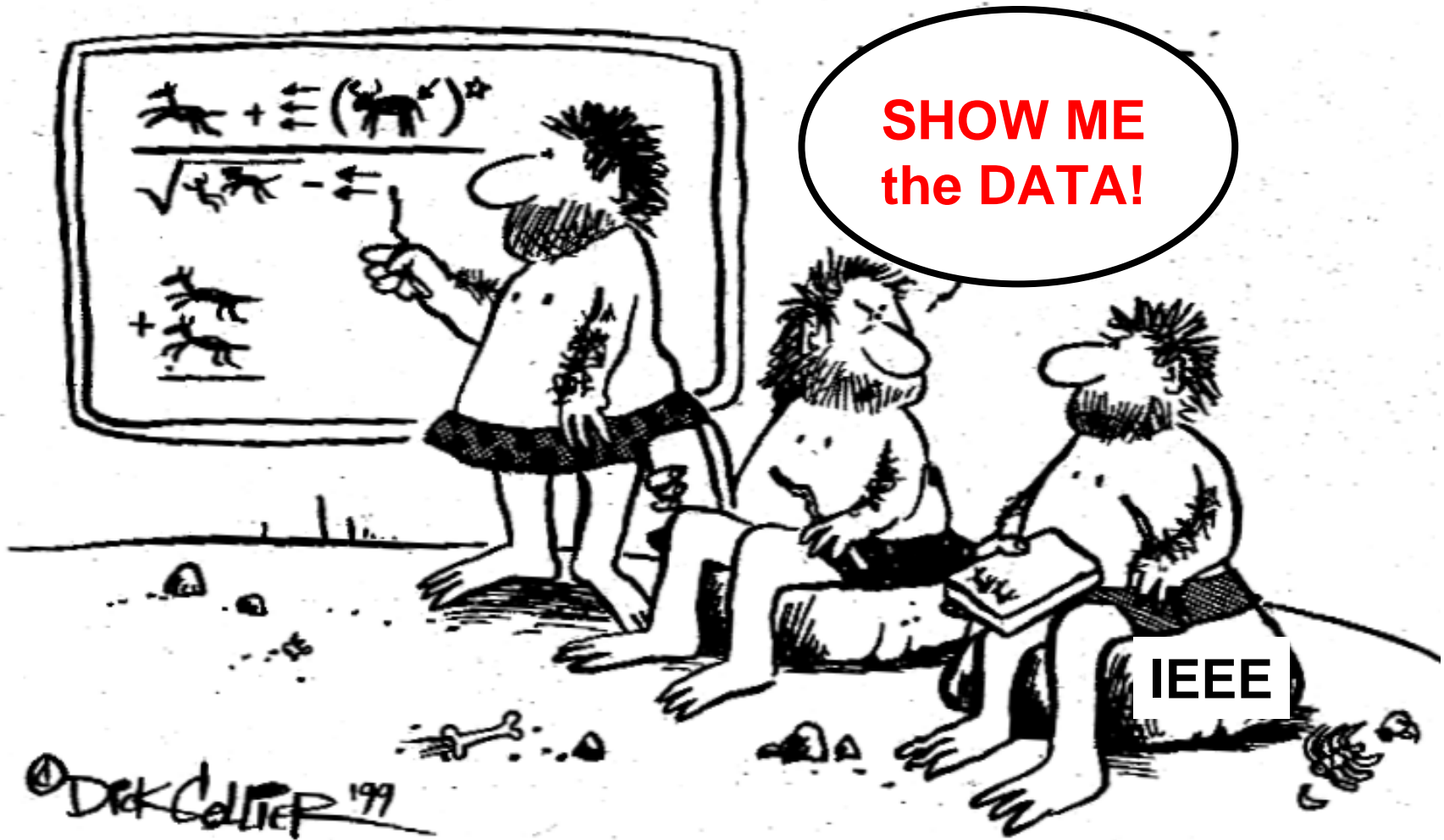
Upcoming Meeting



- **Progress in Electromagnetic Research Symposium (PIERS), Beijing, China, 23-27 March '09 has 3 sessions on EMF bioeffects**
 - **Advances in the Bioeffects and Exposure Standards for Non-Ionizing Radiation – Organized by Michael Murphy**
 - **RF Exposure Safety Issues – Organized by C-K Chou**
 - **Biomedical Applications of Electromagnetic waves**
 - **Organized by Xu Li,**
- **Abstracts are due by 7 September 2008.**
- **Call-for-Papers are available at <http://piers.mit.edu/piers/>**
- **Abstract submission (due 7 Sept '08) at http://piers.mit.edu/piers2k9Beijing/submit/submit_new.php**



QUESTIONS?



ICES Meeting 10,000 BC – approved minutes still not available.



DoD & NATO EMF STANDARDIZATION

IEEE/ICES

San Diego, CA

6-8 June 2008

Dr. B. Jon Klauenberg

Senior Research Physiologist

Human Effectiveness Directorate

Air Force Research Laboratory



Standardization???





OUR POSITION ON EVERYTHING

