

IEEE/ICES

**Report on
TC95/SC3&4 Combined Meeting**

A. Thansandote

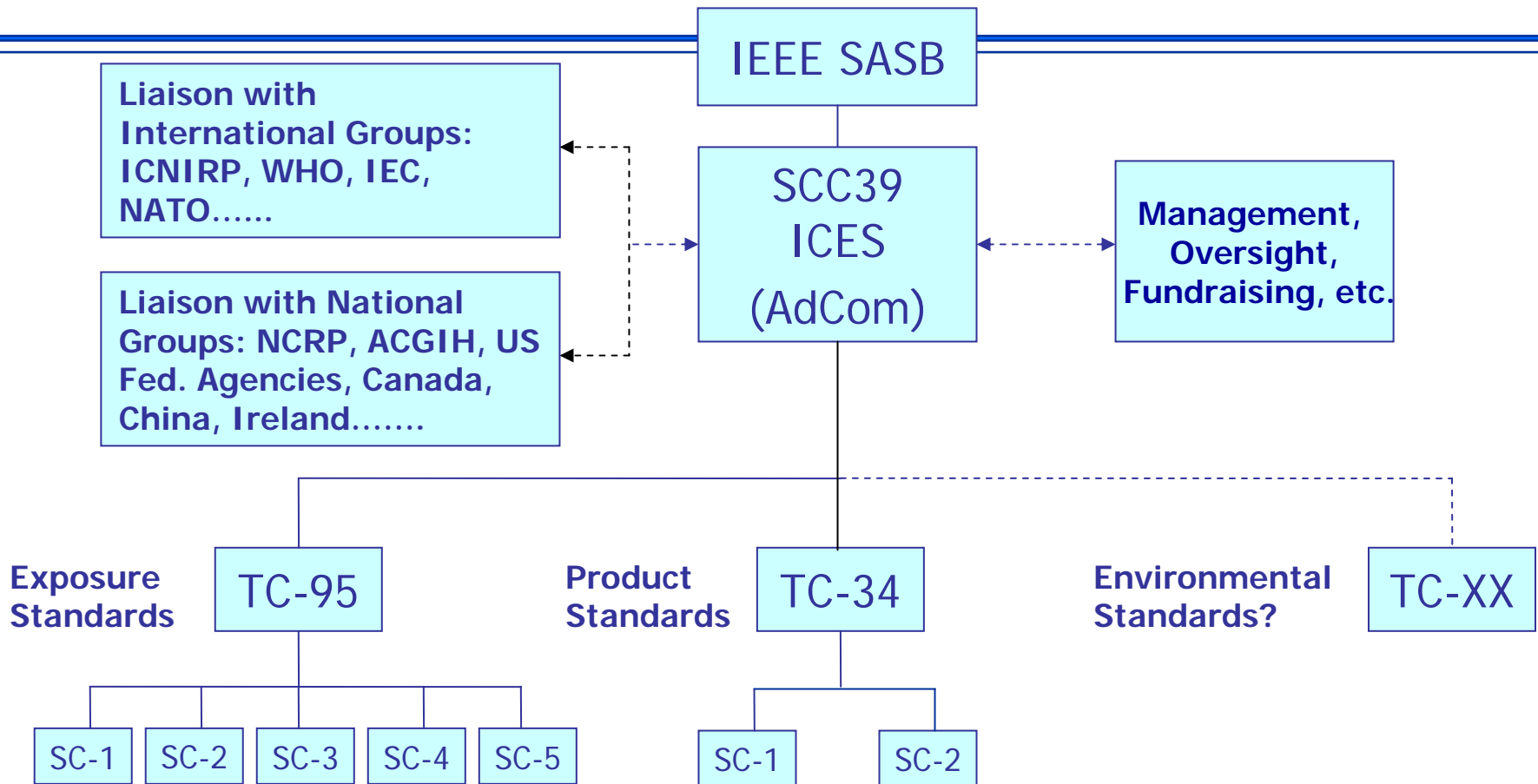


Sunstar Parkhotel, Davos, Switzerland, June 21, 2008

ICES/TC95/SC3&4 Meeting, June 20, 2009

- Meeting chaired by Marv Ziskin
- About 25 members and guests attended
- David Black kindly accepted the chair's request to take meeting minutes

ICES as the Focal Point in the Global Program for EME Safety Standards



SC-1: Measurements & Calculations
SC-2: Warning Signs/Hazard Comm
SC-3: 0-3 kHz
SC-4: 3 kHz - 300 GHz
SC-5: EEDs

SC-1: SAR Evaluation – Measurement Techniques
SC-2: SAR Evaluation – Computational Techniques

TC95/SC3&4

Subcommittee 3

- Co-chairs: Phil Chadwick and Thanh Dovan
- Task: Develop an exposure standard C95.6 - Safety Levels w.r.t. Human Exposure to EMFs, 0 to 3 kHz.

Subcommittee 4

- Co-chairs: Marv Ziskin and Art Thansandote
- Task: Development of Standard C95.1 - Safety Levels w.r.t. Human Exposure to RF EMFs, 3 kHz to 300 GHz.

IEEE Human Safety Standards History

- 1960: USASI C95 Radiation Hazards Project and Committee chartered**
- 1966: USAS C95.1-1966**
 - 10 mW/cm² (10 MHz to 100 GHz)
 - based on simple thermal model
- 1974: ANSI C95.1-1974 (limits for E² and H²)**
- 1982: ANSI C95.1-1982 (incorporates dosimetry)**
- 1991: IEEE C95.1-1991 (two tiers – reaffirmed 1997)**
- 2002: IEEE C95.6-2002 (0-3 kHz)**
- 2006: IEEE C95.1-2005 published on April 19, 2006 (comprehensive revision, 250 pages, 1143 ref.)**

ICES TC95/SC3&4 Standards: Status

- **C95.1-2005: (Safety levels, 3 kHz – 300 GHz)**
 - ❖ **Approved 2005; published 2006**
 - ❖ **Will be combined with C95.6 to cover 0 Hz to 300 GHz**

- **C95.6-2002: (Safety levels, 0 - 3 kHz)**
 - ❖ **Reaffirmed 2007**

- **PC95.1a: (Safety levels, 3 kHz – 300 GHz)**
 - ❖ **Amendment 1 (sets ceiling values for induced & contact current)**
 - ❖ **Now in ballot**

TC95/SC3&4 Meeting Report

- **Legislation Situation in Malaysia by Vany Muthuvelu**
 - ❖ **Draft exposure standards: part 1 (up to 3 kHz) and part 2 (3 kHz – 300 GHz), based on ICNIRP guidelines, completed.**
 - ❖ **Precautionary measures adopted to manage any perceived health risks.**
- **Draft Australian ELF exposure standard by Vitas Anderson**
 - ❖ **Basic restrictions are based on internal E fields, similar to C95.6; field strength limits are somewhat more stringent.**
 - ❖ **Status: under approval process.**
- **Update on ICNIRP standards by A Thansandote**
 - ❖ **Guidelines on static fields published in April 2009**
 - ❖ **Guidelines on low frequency fields (1Hz – 100 kHz) will soon be posted at www.icnirp.org for general consultation**
 - ❖ **ICES will form a taskforce to review and comment.**

Status of NATO/IEEE STANAG

- An agreement between IEEE Standards Association and NATO Standardization Agency was signed in Brussels on May 14, 2009
 - ❖ Assign responsibility for transfer, conversion and maintenance of NATO EMF exposure standard STANAG 2345 to IEEE-ICES.
 - ❖ ICES was chosen because of its open consensus process and ability to set limit values in their standards.



- 1 Ron Petersen,
ICES secretary
- 2 Ralf Bodemann,
ICES chairman
- 3 Susan Tatiner,
IEEE SA Director

B Jon Klauenberg, ICES member, led the effort.

Issues on Merging of C95.1 and C95.6

- C-K Chou appointed as Chairman of Editorial Committee.

- C95.1 and C95.6 text comparison was discussed. Differences in the descriptions and terminologies were tabulated and should be addressed. For example,
 - ❖ C95.6 basic restriction lower tier – general public.
 - ❖ C95.1 basic restriction lower tier – action level.

- Editorial Committee will soon meet to discuss the process and begin to work on the merging.

Literature Surveillance (J. Morrissey)

IEEE ICES Database
ElectroMagnetic Field Literature
Search Engine



Home

View EMF Studies
(Static,ELF)
0-300 Hz

View EMF Studies
(Intermediate)
300 Hz-300 KHz

View EMF Studies
(RF/mmW/THz)
300 kHz-300 GHz

Advanced Search

Citation List
(Author Search)

E-mail

Project Database

(Database last updated on Jun 12, 2009)

<http://ieee-emf.com/>

Frequency Range	<input type="text" value="All Ranges"/>
Frequency Sub-Range	<input type="text" value="All Sub-Ranges"/>
Study Type	<input type="text" value="All Types"/>
Study Sub-Type	<input type="text" value="All Sub-Types"/>
Study Class	<input type="text" value="All Classes"/>
Funding Agency	<input type="text" value="All Agencies"/>
Status	<input type="text" value="All Statuses"/>
Country	<input type="text" value="All Countries"/>
Summary Key Word	<input type="text"/>
Investigator's Name	<input type="text"/>
Author's Last Name	<input type="text"/>



Literature Surveillance (J. Morrissey)

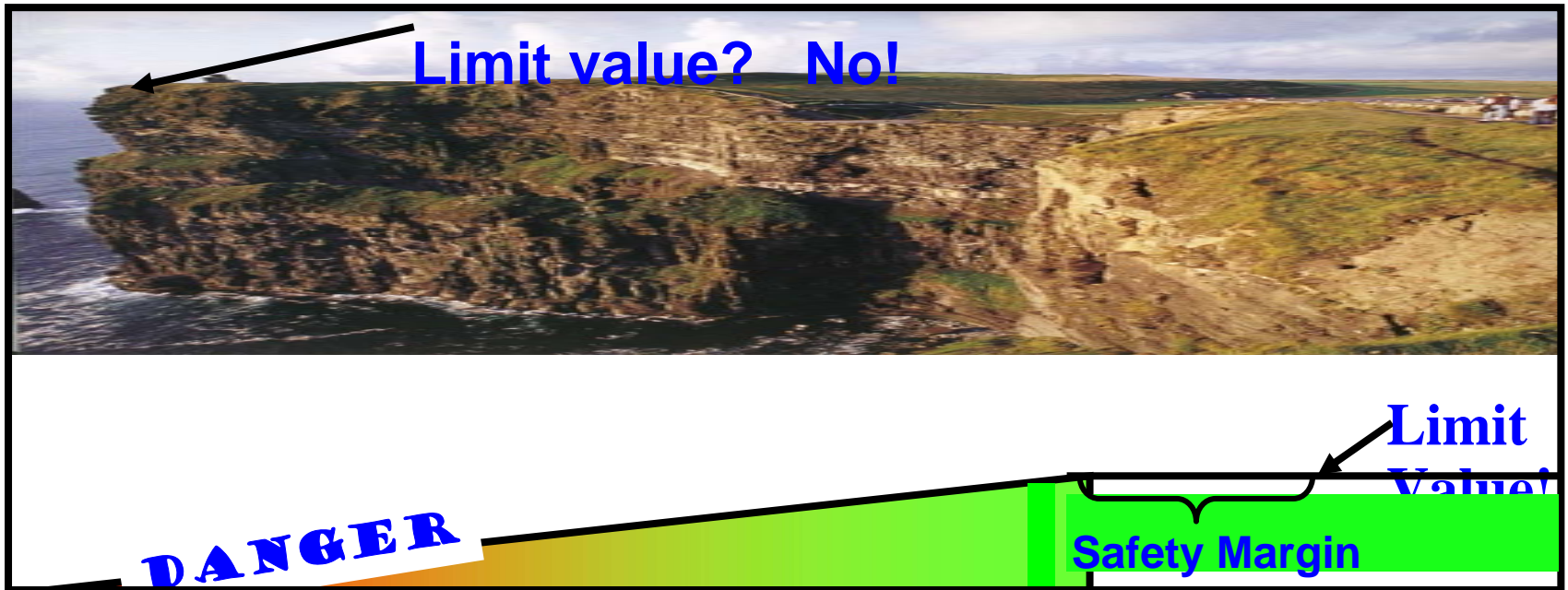
<u>Study Type</u>	<u>RF ALL</u>	<u>RF 2003+</u>
Epidemiology	332	149
Human	270	166
Animal	913	202
In Vitro	<u>517</u>	<u>169</u>
Total	2032	686

Next Step: Detailed Task Force Review

- epidemiology Erdreich, Krewski, Elwood
- **epi exposure assess** Malanjyc
- human studies van Rongren, Croft, Black
- in vivo studies
- **animal cancer bioassays** Elder , Bushberg, McCormick
- **animal behav brain bchm** D'Andrea
- **aud path / MW hearing** Chou
- **teratogenicity / reprod** Ziskin, Elder, McCormick
- **time-temp thresholds** Dewhirst
- **BBB** Elder
- **Immune function** ????
- **Hormone changes** ????
- in vitro studies Morrissey, McNamee, Leszczynski
- **membrane, Ca++ signaling** Haberland
- **mechanisms** Haberland

General Discussion

- Standards shall be science-based and should be realistic.
- Standards should be conservative.
- Add a section to the rationale that there is no cliff; however, if exposure limits are exceeded, health risks will be increasing.



Next Meeting

TC95/SC3&4 Summer Meeting 2010

- Participants voted to recommend AdCom to consider holding the next summer meeting in Seoul, Korea, before or after the BEMS Annual Meeting, June 2010.