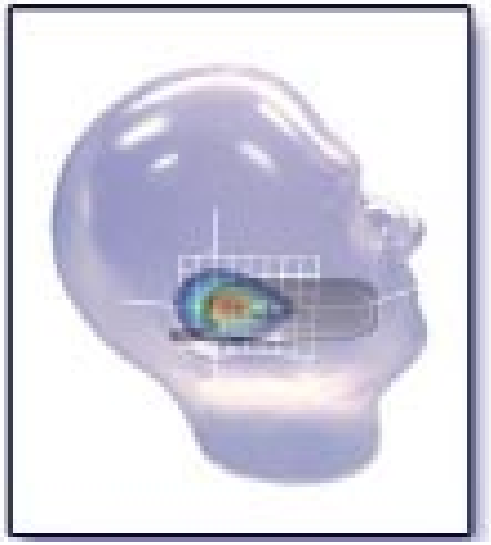
SCIENCE



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 Std C95.6-2002

IEEE Std C95.6-2002 "IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0 to 3 kHz" is the first ICES standard to address frequencies below 3 kHz. The basic restrictions and maximum permissible exposures are derived to avoid: (1) aversive or painful stimulation of sensory neurons; (2) muscle excitation that might lead to injuries while performing potentially hazardous activities; (3) excitation of neurons or direct alteration of synaptic activity within the brain; (4) cardiac excitation (heart contraction) that might lead to fibrillation; and (5) magneto-hydrodynamic effects.

IEEE Std C95.1-2005

The revision of IEEE Std C95.1-1991 (1999) was approved by the IEEE Standards Association Standards Board 3 October 2005 and published 19 April 2006. Of the more than 2200 published reports included in the ICES database, more than 1100 were considered relevant to standard setting and have been thoroughly reviewed by scientists with backgrounds in the life sciences, physical sciences and engineering. This is the most comprehensive literature evaluation ever undertaken for an RF safety standard..

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: "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"

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March 2006

IEEE

INTERNATIONAL COMMITTEE *on* ELECTROMAGNETIC SAFETY

ICES

Safety Standards for Electromagnetic Fields