



IEC/TC OR SC: TC 106	SECRETARIAT: Germany	DATE: 30 September 2015
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NOTE: THIS DOCUMENT CONTAINS THE STRATEGIC BUSINESS PLAN OF IEC TC 106. THE BOXES IN GREY PROVIDE THE IEC GUIDANCE FOR THE UNDERSTANDING OF THE RESPECTIVE CATEGORY OF THE STRATEGIC BUSINESS PLAN.

A. STATE TITLE AND SCOPE OF TC

Are there any new or emerging trends in technology that will impact the scope and work activities of the TC? Please describe briefly.

Do you need to update your scope to reflect new and emerging technologies? If yes, will these changes impact another TC's scope or work activities?

If yes, describe how these will impact another TC(s) and list the TC(s) it would impact

TC 106 Title

Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure

TC 106 Scope

To prepare international standards on measurement and calculation methods to assess human exposure to electric, magnetic and electromagnetic fields. The task includes:

- characterisation of the electromagnetic environments with regard to human exposure;
- measurement methods, instrumentation and procedures;
- calculation methods;
- assessment methods for the exposure produced by specific sources (in so far as this task is not carried out by specific product committees);
- basic standards for other sources;
- assessment of uncertainties.

It covers the whole frequency range from 0 Hz to 300 GHz. It applies to basic restrictions and reference levels.

Excluded are:

- the establishment of exposure limits (see AC/38/2009 of 2009-11-27);
- mitigation methods which have to be dealt with by the relevant product committees;
- electrical safety (however, the issue of contact current related to the indirect effect of human exposure to electromagnetic fields is included).

B. MANAGEMENT STRUCTURE OF THE TC

Describe the management structure of the TC (use of an organizational chart is acceptable) (should be integrated by CO automatically) and, if relevant (for example an unusual structure is used), provide the rationale as to why this structure is used.

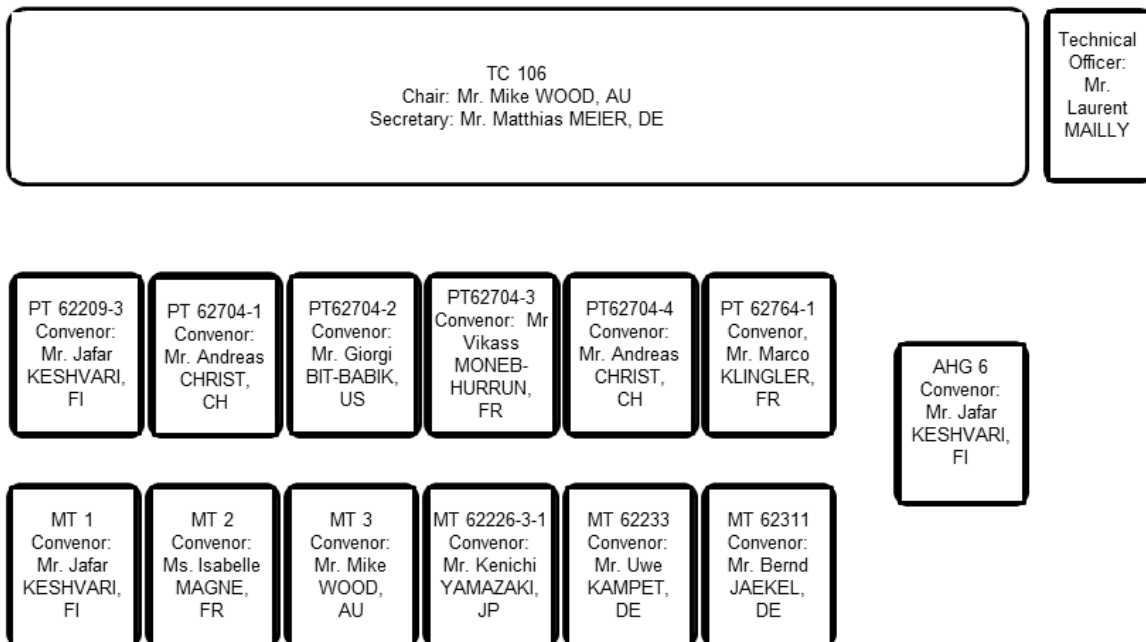
Note: Check if the information on the IEC website is complete.

When was the last time the TC reviewed its management structure? Describe any changes made. When does the TC intend to review its current management structure? In the future, will the TC change the current structure, for example due to new and emerging technologies, product withdrawal, change in regulations etc. Please describe.

Make sure the overview includes:

- any joint working groups with other committees,
- any special groups like advisory groups, editing groups, etc.

Structure of TC 106



TC 106 chose a flat management structure. All convenors report directly to TC106.

C. BUSINESS ENVIRONMENT

Provide the rationale for the market relevance of the future standards being produced in the TC.

If readily available, provide an indication of global or regional sales of products or services related to the TC/SC work and state the source of the data.

Specify if standards will be significantly effective for assessing regulatory compliance.

Market Relevance

The standards developed by TC106 are used globally by the wireless, mobile, broadcasting, automotive and electrical power sectors for assessment of human exposure to electromagnetic fields. This includes the compliance assessment for all mobile phones, tablets and wireless

devices, and electric power distribution including wireless power transfer and electric vehicles.

Sales of Products or Services

The global market for electric vehicles is expected to reach more than 20 million vehicles in 2020. Electric Vehicle charging stations are forecast to more than 11 million in 2020.

The International Telecommunication Union (ITU) estimates that the number of mobile telephone subscribers around the world increased from 6,6 billion in 2013 to 7,0 billion at the end of 2015. The mobile phone subscribers represent 87% of all the telephone subscribers. Worldwide, mobile telephone penetration has reached 96,1 percent at the end of 2014

Source: <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx> (accessed on 07 October 2015)

By 2020, the International Telecommunications Union (ITU) estimates there will be in excess of 50 billion wireless connected devices in use globally.

GSMA estimates 3,6 billion unique mobile subscribers at the end of 2014 that will grow at 4 % per annum to 4,6 billion unique subscribers by 2020. The corresponding numbers for global SIM connections are 7,3 bn (2014) and 10 bn (2020) for a 5,4 % growth rate.

The sales of services related to mobile base stations can be described by using mobile traffic. The Ericsson Mobility report (June 2015) estimates an increase of the monthly mobile data traffic from 3,3 EB/month in 2014 to 30,5 EB/month in 2020. This represents an annual growth rate of 45 %. The mobile base station infrastructure has to accommodate this increase in traffic.

Source: Ericsson Mobility Report, June 2015, available on <http://www.ericsson.com/res/docs/2015/ericsson-mobility-report-june-2015.pdf>; accessed on 07 October 2015

Assessing Regulatory Compliance

The TC106 standards will be significantly affective for assessing the regulatory compliance for human exposure of mobile phones, wireless devices, broadcasting equipment, power distribution and electric vehicles.

D. MARKET DEMAND

Provide a list of likely customers of the standards (suppliers, specifiers, testing bodies, regulators, installers, other TC/SC's etc.). Do not specify company names, only categories of customers.

Likely Customers of the Standards

Direct customers of standards that are developed by TC 106 include national regulatory bodies, test laboratories, manufacturers, operators, consumers and local planning bodies.

Specifically for the low frequency range customers include electric power utilities, domestic and industrial appliance manufacturers. For the high frequency range, customers of TC 106 standards include all manufacturers of RF and microwave equipment, particularly manufacturers of wireless networks, mobile phones and base station equipment.

- Mobile telecommunications, wireless and broadcast equipment manufacturers and suppliers
- Electric Power Utilities and equipment suppliers
- Equipment designers and installers
- Laboratories and test houses
- Mobile and broadcast operators
- Regulators and government agencies

- Facilities and building management,
- Installers and contractors
- Automotive

The list of IEC Technical Committees (TCs) that make reference to TC 106 standards includes (but is not limited to) the following:

- TC 9 : Electrical equipment and systems for railways
- SC 17C : High-voltage switchgear and controlgear assemblies
- TC 26 : Electric welding
- TC 27 : Industrial electroheating and electromagnetic processing
- TC 29 : Electroacoustics
- TC 34 : Lamps and related equipment
- TC 69 : Electric road vehicles and electric industrial trucks
- TC 78 : Live working
- TC 96 : Transformers, reactors, power supply units, and combinations thereof

E. TRENDS IN TECHNOLOGY AND IN THE MARKET

If any, indicate the current or expected trends in the technology or in the market covered by the products of your TC/SC.

Trends in the Technology

In addition to radio and television broadcast, and personal communications used today, technology is rapidly evolving towards a world in 2020 where most consumer, domestic, industrial, business, educational and medical applications and devices will be connected via the internet using a range of wireless technologies and networks.

In the high frequency range, mobile phone technologies are evolving quickly and multiple frequency bands are being used in a single device. In addition, RF communication modules (Wi-Fi, Bluetooth, etc.) are now integrated in many electronic equipment (e.g. laptop, camera, credit card reader, etc), appliances, vehicles and millimeter wave applications including ultra highspeed communication, on-vehicle radars, non-destructive examination systems.

Communities in the developed and developing world are rapidly deploying smart sustainable cities using wireless technology to enable the essential communications (e.g. smart meters). The International Telecommunications Union (ITU) forecasts in excess of 50 billion connected devices by 2020.

In the high frequency range wireless technologies and networks include radio and television broadcast, VHF and UHF mobile communications, 4G and 5G mobile, WiFi, Bluetooth, ZigBee and Near Field Communications.

The use of low frequency and high frequency Wireless Power Transfer as a technology has now evolved as a commercial reality enabling the charging of batteries supplying power to personal devices, vehicles and commercial equipment.

Trends in the Market

The use of mobile telephones and similar wireless technologies has rapidly increased in the past 10 years and is expected to continue throughout the world. Novel and evolving products are marketed at a high rate which provides a pressing need to develop new or to revise existing international standards for the characterization of human exposure. These standards address wireless devices intended to be operated in close proximity to the body, e.g., mobile telephones, and for the characterisation of human exposure in the vicinity of wireless networks and base-stations including rooftop mobile base stations with multiple services, (where much

of the public concern is directed).

To ensure compliance with the human exposure limits for electromagnetic fields, compliance and environmental assessment standards need to match the technology evolution, especially for body worn equipment and devices used in close proximity to the body.

Nearly all devices and corresponding networks will need to be assessed for compliance with the human exposure limits. Compliance assessment test procedures will need to be designed for maximum efficiency given the anticipated high volume of testing required whilst maintaining sufficient accuracy.

There is a pressing need for international standards characterizing the human exposure.

F. SYSTEM APPROACH ASPECTS (REFERENCE - AC/33/2013)

Does your TC/SC have a need for a systems approach?

If so:

- Will the Systems work be in a single TC or in multiple TCs?
- Will a Systems Evaluation Group (SEG), Systems Committee (SyC), or Systems Resource Group be required?
- Is your TC/SC work of relevance to ISO?
- Is or are there fora or consortia working in parallel to IEC? Is there a chance to integrate this work in your TC/SC?

This should not only be restricted to the customer/supplier relationships with other TC/SCs indicating types of co-operation (e.g. liaisons, joint working groups) but be of a more generic nature.

If there is no need for a systems approach as outlined in AC/33/2013, is it intended a TC would not be requested to report on general systems approach considerations such as customer/supplier relationships, liaisons, joint WGs, etc. as referenced in the system approach matrix illustrated in slide 14 of the presentation attached to AC/37/2006?

Not applicable to TC 106.

G. CONFORMITY ASSESSMENT

With reference to clause 6.7 of Part 2 of the ISO/IEC directives, are all your publications in line with the requirements related to conformity assessment aspects?

Will the TC/SC publications be used for IEC Conformity Assessment Systems (IECEE, IECEx, IECQ, IECRE)?

Will any of your standards include test specifications, reproducible test requirements, and test methods?

Are there likely to be special conformity assessment requirements generated by any standards projects? If yes, list which projects.

Conformity Assessment Aspects

TC 106 standards may be use for conformity assessment. The exposure limits are established by national regulators. The standards developed by TC 106 can be used for measurement and calculation of the physical quantities that have to be assessed for the conformity assessment of electrotechnical product with the view of exposure to electronagmetic fields and to contact currents.

Use for IEC Conformity Assessment Systems

IECEE: IEC 62233, 62311

IECEX: n/a

IECQ: n/a

IECRE: n/a

Reproducible Test Specifications, Test Requirements, Test Methods

TC 106 documents include requirements for procedures to assess the exposure of humans to electromagnetic fields in order to produce repeatable and reproducible conformity assessment results.

Special conformity assessment requirements

TC 106 documents do not include requirements related to conformity assessment other than requirements which are necessary to provide repeatable and reproducible conformity assessment results. The assessment requirements for radio products are exposure limits. The development of exposure limits is excluded from the scope of TC106 (see AC/38/2009 of 2009-11-27). Exposure limits are established by national regulators. The respective conformity assessment requirements are regulated by national governments.

H. 3-5 YEAR PROJECTED STRATEGIC OBJECTIVES, ACTIONS, TARGET DATES

STRATEGIC OBJECTIVES 3-5 YEARS	ACTIONS TO SUPPORT THE STRATEGIC OBJECTIVES	TARGET DATE(S) TO COMPLETE THE ACTIONS
Wireless Power Transfer – Implement a compliance assessment standard for Wireless Power Transfer equipment and devices	Establish Working Committee Identify assessment requirements & current gaps Determine if new IEC standard is required or if existing standard can be adapted	2015 - Establish Working Group 2017 - Technical report
5G Assessment Methods for Networks and Devices- Develop and Implement efficient test assessment methods for 5G technology including network equipment and devices	Identify new assessment requirements for 5G Conduct gap analysis on existing IEC Standards Assign work to MT1 and MT3 based on identified requirements	Revise standards as applicable – 2018/19
Body Worn Device Compliance – Review assessment methods and applicability of existing IEC Standards	Review and update the MT1 business plan	Revise standards as applicable – 2017/18
Smart Sustainable Cities – Review compliance assessment requirements and applicability of IEC Standards	Monitor activities Identify gaps in current IEC standards	
EMF Guide - for developing consistent and quality standards for the assessment of human exposure	Confirmed Ad Hoc Group in 2015 in Stresa Identify requirements and gaps for the EMF Guide on developing consistent and quality standards for assessment of human exposure	2016 – complete draft EMF Guide and report back to TC106 plenary.
Contact currents Address methods for assessment of contact current related to human exposures to electric, magnetic and electromagnetic fields; not including electrical shock.	Establish working group Determine measuring methods for contact currents Determine an electrical circuit that represents the characteristics of human response	2015 Establish working group in Stresa (Italy) 2016 – initial document: August 2016

NOTE: THE PROGRESS ON THE ACTIONS SHOULD BE REPORTED IN THE RSMB.