

JUSTIFICATION FOR COMMON REGULATORY OBJECTIVES FOR WIRELESS LOCAL AREA NETWORK (WLAN) EQUIPMENT

This document provides the justification for a Common Regulatory Objective related to Wireless Local Area Network (WLAN) equipment. It identifies the requirements that are relevant to the CRO. The output from this document will be used for the WLAN CRO.

1. WLAN EQUIPMENT

1.1 GLOBAL USE

WLAN is an industry standard for wireless connectivity using data and/or voice links over short distances. It enables electronic devices to connect and communicate wirelessly. WLAN as described in IEEE Std 802.11b uses the unlicensed 2.4 GHz Industrial, Scientific and Medical (ISM) frequency band. This frequency band is recognised globally, and is used by different technologies. Standardisation organisations have defined standards to ensure co-existence between these different technologies.

WLAN technology is used globally and one of its many uses is for people travelling, to allow them to connect their portable PCs to host networks at the location where they are, in order to communicate with their home location, or access data locally.

1.2 APPLICATIONS COVERED

The range of applications covered by this equipment is extremely wide. WLAN applications may be considered similar to Bluetooth but extended to multimedia and video applications and available to a much greater number of connections. WLAN technology can easily be considered focused in business and professional applications while Bluetooth covers home and small business areas. Both technologies are being established worldwide and represent one of the most important recent successes of the Telecommunications sector. In principle a WLAN connection can replace any existing home or business network. Some of these applications are:

- In mobile or fix multimedia terminals, the connection to a wireless terminal allowing hands-free and wireless use of it, i.e. the user may pursue another action simultaneously with the call;
- In mobile, fix multimedia terminals, the connection to a Personal Computer [PC] allowing wireless broadband connection of the PC to internet, which opens a unlimited range of applications including video applications and quick internet access
- In the home or office environment the connection between a PC, a printer, a video camera or any other remote sensor or device; this opens again a unlimited range of applications like remote surveillance or control of devices

Security, safety, health, research, education, social support, small business and many other areas can therefore easily beneficiate from this technology.

2. IDENTIFICATION OF STANDARDS /RECOMMENDATIONS TO SATISFY REGULATORY OBJECTIVES

Standards are continually revised. It is necessary to allow for a transition period between versions. This means that, in general, more than one version of a standard is acceptable as a basis for the CRO. Rather than list all acceptable versions, the “oldest acceptable” version at the time of publication of the CRO is listed. Subsequent versions of the listed standards are to be accepted unless otherwise stated by Countries having agreed on the CRO.

The standards relevant for this CRO are listed in the Annex. A rationale for the choice of these standards is given.

3. REVIEW

This document should be reviewed periodically to ensure that the requirements are still valid and suitable for the CRO in question. The review should aim to reduce the requirements in the CRO to a minimum allowing for new innovative products and/or solutions to be placed on the market.

Where necessary, an update of the CRO should be initiated.

ANNEX

A. Safety, excluding Electromagnetic Fields

IEC 60950 (1999)	Safety of information technology equipment
CB Bulletin (parts covering the intended markets)	IECEE (The IEC System for Conformity Testing and Certification of Electrical Equipment).

Rationale:

The international standard for equipment in this sector is IEC 60950. Due to special national conditions in some countries, national deviations or amendments exist. The best collection of such deviations and amendments is given in the CB Bulletin, used for the The “IEC System for Conformity Testing and Certification of Electrical Equipment” (IECEE, see <http://www.iecee.org/>).

B. Electromagnetic Fields

Exposure limits

ICNIRP (April 1998)	Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz) – International Commission on Non-Ionizing Radiation Protection (ICNIRP), Health Physics, Vol. 74, No. 4, April 1998.
IEEE C95.1 (1999)	Standard for safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz.

Rationale:

ICNIRP: There is no IEC or other international standard specifying limits for human exposure to electromagnetic fields. ICNIRP is an international independent scientific organization that cooperates with WHO, IEC and other international organizations. Its recommended limits have been endorsed by the WHO and have been implemented in several national standards and regulations worldwide. The ICNIRP general public exposure limits have been adopted in the EC Council Recommendation on EMF (1999/15/EC).

IEEE C95.1: The IEEE standard has been the basis for national EMF standards and regulations in a number of countries. It is very similar to the ICNIRP guidelines but there are some differences in the limits applicable for wireless products. In many countries it has been or will be

replaced by the ICNIRP guidelines. In the US, the FCC has adopted the IEEE limits for portable radio devices (FCC 47 CFR 1.1310, CFR 47 2.1093). The IEEE is in the process of revising the C95.1 standard, and a closer harmonization with ICNIRP is possible.

Compliance Assessment (portable and mobile devices)

- CENELEC EN 50360:2001 Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz – 3 GHz).
- CENELEC EN 50361:2001 Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz – 3 GHz).
- CENELEC EN 50371:2002 Generic standard to demonstrate the compliance of low power electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (10 MHz – 300 GHz) – General public.
- FCC OET Bulletin 65 (2001) Supplement C: Evaluating compliance with FCC guidelines for human exposure to radiofrequency electromagnetic fields: Additional information for evaluating compliance for mobile and portable devices with FCC limits for human exposure to radiofrequency emissions.

Rationale:

EN 50360 and EN 50361: EN 50360 is a product standard used for EU:s R&TTE directive and specifies EMF requirements for mobile phones (GSM and IMT-2000). EN 50361 describes the test method and procedures that should be used to verify that the product is in compliance with the requirements of EN 50360 (SAR testing). There is not yet any international standard for RF exposure assessments of mobile and portable wireless devices. IEC is in the process of developing such a standard (draft IEC 62209), which will cover handheld, bodyworn, laptop, desktop and palmtop terminals (IMT-2000, WLAN and Bluetooth). It is expected that the IEC standard will be adopted as an EN and replace EN 50361.

Regulatory bodies in most countries accept the use of EN 50361 to show compliance with exposure limits. A Japanese version of the standard has been published by ARIB (T56, 2002).

EN 50371: This generic standard specifies test exclusions for low-power devices (< 20 mW) transmitted power. It is applicable for e.g. short-range Bluetooth products.

OET Bulletin 65: With no international standard, the FCC has issued a test specification for portable (handheld and bodyworn) and mobile wireless terminals. For handheld phones, it is based on a draft IEEE standard (P1528) that will be published in a near future. The IEEE standard is well harmonized with the IEC draft and with EN 50361.

Compliance Assessment (base stations and fixed terminal stations)

- CENELEC EN 50385:2002 Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to general public exposure to radio frequency electromagnetic fields (110 MHz – 40 GHz).
- CENELEC EN 50383:2002 Basic standard for the calculation and measurement of electromagnetic field strength and SAR related to human exposure from radio base stations and fixed terminal stations for wireless telecommunication systems (110 MHz – 40 GHz).
- CENELEC EN 50371:2002 Generic standard to demonstrate the compliance of low power electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (10 MHz – 300 GHz) – General public.

Rationale:

EN 50385 and EN 50383: EN 50385 is a product standard used for the EU's R&TTE directive and specifies EMF requirements for base stations and fixed terminal stations (GSM, IMT-2000, WLAN). EN 50383 describes the measurement and calculation methods and procedures that should be used to verify that the product is in compliance with the requirements of EN 50385. There is no international standard for RF exposure compliance assessments of base station products.

EN 50371: This generic standard specifies test exclusions for low-power devices (< 20 mW) transmitted power. It is applicable for fixed low-power transmitters.

C. Electromagnetic Compatibility

- ETSI EN 301 489–1 v1.3.1 Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
- ETSI EN 301 489–17 v1.1.1 Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Wideband data and HIPERLAN equipment
- FCC Part 15.207 (2001) Radio Frequency Devices; Intentional Radiators; Conducted limits
- FCC Part 15.209 (2001) Radio Frequency Devices; Intentional Radiators; Radiated emission limits

Rationale:

There are no particular IEC/CISPR standards published covering EMC requirements for radio transmitting equipment. Regional standards are therefore used.

ETSI: The ETSI EN 301 489-series of standards call upon the following IEC/CISPR standards (in the form of European standards) for the different requirements:

- For emission: CISPR 22, IEC 61000-3-2, -3
- For immunity: IEC 61000-4-2, -3, -4, -5, -6, -11

Note 1: In the EU, protection of electricity distribution networks is part of the emission aspects of EMC regulation. Therefore, requirements for harmonics and flicker are part of the standards used for regulatory purposes.

Note 2: Immunity aspects are included in EU's EMC regulation.

FCC: The FCC requirements in the United States are very similar to CISPR 22 in the frequency ranges that coincide, but so far the FCC does not recognise the CISPR standard as equivalent. Therefore, these are included.

D. Effective use of the radio spectrum

ETSI EN 300 328-1 v1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Part 1: Technical characteristics and test conditions
FCC Part 15:247 (2001)	Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz.
FCC Part 15:205 (2001)	Restricted bands of operation.
(FCC Part 15.209 (2001)	Radiated emission limits - Listed under "C")
ARIB STD-T66 v1.0	Second Generation Low Power Data Communication System/Wireless LAN System

Rationale:

There is no single global standard available to cover the objectives "effective use of radio spectrum" for WLAN equipment (short range devices operating in the 2,4 GHz ISM band). The standards listed above largely overlap but will ensure the effective use of frequency spectrum on a global level. The technical aspects cover

- Modulation technique;
- Effective radiated power output;
- Peak power density;
- Frequency range;
- Channel spacing/number of channels