SLOVENSKI STANDARD
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Elektromagnetna združljivost in zadeve v zvezi z radijskim spektrom (ERM) - Standard elektromagnetne združljivosti (EMC) za pomorsko radijsko opremo in storitve - 1. del: Splošne tehnične zahteve

Electromagnetic compatibility and Radio spectrum Matters (ERM) - ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services - Part 1: Common technical requirements

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Foreword

This Harmonized European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Directive 98/34/EC [i.8] as amended by Directive 98/48/EC [i.10].

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility ("the EMC Directive") (2004/108/EC [i.3] as amended), and Directive 1999/5/EC [i.4] of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity ("the R&TTE Directive" [i.4]).

Technical specifications relevant to the EMC Directive [i.3] and the R&TTE Directive [i.4] are given in annex A.

The present document is based upon the standard for marine navigational equipment EN 60945 [1], and other standards where appropriate, to meet the essential requirements of Council Directives 2004/108/EC [i.3] and 1999/5/EC [i.4] respectively.

The present document, and its product related parts are based on the current EMC product standards for marine radio equipment published by ETSI. It should be noted that two of these EMC standards have also been published in the Official Journal of the European Commission referring to the EMC Directive [i.3].

The present document is part 1 of a multi-part deliverable covering the ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services, as identified below:

Part 1: "Common technical requirements";

Part 2: "Specific conditions for VHF radiotelephone transmitters and receivers";

Part 3: Void;

Part 4: "Specific conditions for Narrow-Band Direct-Printing (NBDP) NAVTEX receivers";

Part 5: "Specific conditions for MF/HF radiotelephone transmitters and receivers";

Part 6: "Specific conditions for Earth Stations on board Vessels operating in frequency bands above 3 GHz".

National transposition dates	
Date of adoption of this EN:	2 August 2012
Date of latest announcement of this EN (doa):	30 November 2012
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2013
Date of withdrawal of any conflicting National Standard (dow):	31 May 2014

1 Scope

The present document contains the common requirements for marine radio communications equipment and associated ancillary equipment, in respect of ElectroMagnetic Compatibility (EMC).

The provisions of the present document apply to marine radio equipment **not covered** in the scope of the Council Directive on marine equipment (the "Marine Equipment Directive" 96/98/EC [i.5]).

Product dependent arrangements necessary to perform the EMC tests on dedicated types of marine radio communications equipment, and the assessment of test results, are detailed in the appropriate product related parts of the present document.

The present document, together with the product related part, specifies the applicable EMC tests, the methods of measurement, the limits and the performance criteria for marine radio equipment and associated ancillary equipment.

In case of differences (for instance concerning special conditions, definitions, abbreviation) between the present document and the relevant product related part of the present document, the product related part takes precedence.

For the further content of the present document, the expression "radio equipment" is taken to mean marine radio communications equipment, in each individual case.

Technical specifications related to the antenna port of radio equipment and emissions from the enclosure port of radio equipment and combinations of radio and associated ancillary equipment are not included in the present document. Such technical specifications are normally found in the relevant product standards for the effective use of the radio spectrum.

The environment classification used in the present document refers to the environment classification used in:

- EN 60945 [1] for marine navigational equipment,

that means to the maritime environment.

Marine radio communications equipment meeting the EMC requirements set out in EN 60945 [1] is deemed to meet also the EMC requirements for the residential, commercial and light industrial environment as defined in EN 61000-6-3 [i.1] and EN 61000-6-1 [i.2].

The EMC requirements have been selected to ensure an adequate level of compatibility for apparatus intended to be used in the maritime environment. The levels, however, do not cover extreme cases which may occur in any location but with low probability of occurrence.

Compliance of radio equipment to the requirements of the present document does not signify compliance to any requirements related to spectrum management or to the use of the equipment (licensing requirements).

Compliance to the requirements of the present document does not signify compliance to any safety requirements. However, it is the responsibility of the assessor of the equipment to record in the test report any observations regarding the test sample becoming dangerous or unsafe as a result of the application of the tests called for in the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

[1] IEC EN 60945 (2002) + Corrigendum 1 (2010): "Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results".

[2] CISPR 16-1-1 (2006): "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1: Radio disturbance and immunity measuring apparatus".

[3] IEC EN 61000-4-2 (2001): "Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test".

[4] IEC EN 61000-4-3 (2006): "Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test".

[5] IEC EN 61000-4-4 (2004): "Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test".

[6] IEC EN 61000-4-5 (2005): "Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test".

[7] IEC EN 61000-4-6 (2006): "Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] IEC EN 61000-6-3 (2007) + A1 (2011): "Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments".

[i.2] IEC EN 61000-6-1 (2007): "Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments".

[i.3] Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).

[i.4] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).

[i.5] Council Directive 96/98/EC of 20 December 1996 on marine equipment.

[i.6] IEC EN 60050-161 (1990): "International Electrotechnical Vocabulary. Chapter 161: Electromagnetic compatibility".

[i.7] CEPT/ERC Recommendation 74-01 (2011): "Unwanted emissions in the spurious domain".

[i.8] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.

[i.9] IMO Convention: "International Convention for the Safety of Life at Sea (SOLAS)".

[i.10] Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 amending Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

ancillary equipment: equipment (apparatus), used in connection with a receiver, transmitter or transceiver is considered as an ancillary equipment (apparatus) if:

- the equipment is intended for use in conjunction with a receiver or transmitter to provide additional operational and/or control features to the radio equipment, (e.g. to extend control to another position or location); and
- the equipment cannot be used on a stand alone basis to provide user functions independently of a receiver or transmitter; and
- the receiver or transmitter to which it is connected, is capable of providing some intended operation such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

artificial antenna: non-reactive, non-radiating dummy load equal to the nominal impedance of the antenna port

NOTE: For the purpose of EMC tests, the antenna port(s) of the Equipment Under Test (EUT) are terminated with a non-radiating 50 Ω termination (artificial antenna) unless there is a requirement to apply a Radio Frequency (RF) input signal to the receiver antenna port.

continuous phenomena (continuous disturbance): electromagnetic disturbance, the effects of which on a particular device or equipment cannot be resolved into a succession of distinct effects

NOTE: See IEC 60050-161 [i.6].

enclosure port: physical boundary of the apparatus through which electromagnetic fields may radiate or impinge

NOTE: In the case of integral antenna equipment, this port is inseparable from the antenna port.

integral antenna: antenna designed to be connected directly to the equipment with or without the use of an external connector and considered to be part of the equipment

NOTE: An integral antenna may be fitted internally or externally to the equipment. An antenna which may not be removed during the tests, according to the manufacturer's statement.

manufacturer: manufacturer of the equipment, or his authorized representative, or an equipment supplier to the European market

mobile equipment: marine receiver, transmitter or transmitter/receiver (transceiver) intended for installation and use onboard ships

operating frequency range: range(s) of radio frequencies covered by the Equipment Under Test (EUT) without any change of units

port: particular interface, of the specified equipment (apparatus), with the electromagnetic environment

NOTE: For example, any connection point on an equipment intended for connection of cables to or from that equipment is considered as a port (see figure 1).

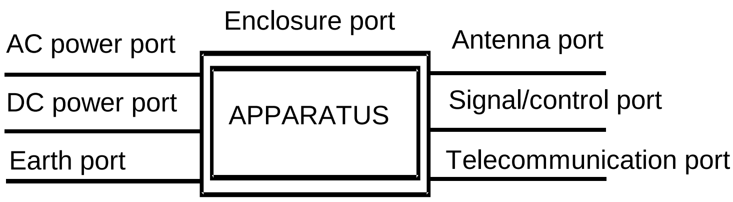

Figure 1: Examples of ports

portable equipment: marine radio and/or ancillary equipment intended for portable (e.g. handheld) operation onboard ships, and powered by its own integral battery

radio communications equipment: marine communications equipment which includes one or more radio transmitters and/or receivers and/or parts thereof for use in a mobile or portable application onboard ships

NOTE: It can be operated with ancillary equipment but if so, is not dependent on it for basic functionality.

removable antenna: antenna which may be removed for the test according to the manufacturer statement

spurious emission: emission on a frequency, or frequencies, which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information

NOTE: Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products but exclude out of band emissions (CEPT/ERC Recommendation 74-01 [i.7]).

transient phenomena (transient disturbance): pertaining to or designating a phenomena or a quantity which varies between two consecutive steady states during a time interval short compared with the time-scale of interest

NOTE: See IEC 60050-161 [i.6].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AC	Alternating Current
AM	Amplitude Modulation
AMN	Artificial Mains Network
B	measurement Bandwidth
DC	Direct Current
EM	ElectroMagnetic
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
RF	Radio Frequency
rms	root mean square

4 Test conditions

4.1 General

The equipment shall be tested under normal test conditions according to the relevant product and basic standards or to the information accompanying the equipment.

The test shall be carried out at a point within the specified normal operating environmental range of temperature and humidity with the equipment connected to the normal power supply voltage. The normal temperature and humidity conditions shall be a combination of temperature and humidity within the following ranges:

- temperature: +15 °C to +35 °C
- relative humidity: 25 % to 75 %

The normal test voltage for equipment to be connected to the AC mains, shall be the nominal (rated) mains voltage. The frequency of the test voltage shall be 50 Hz ± 1 Hz.

The normal test voltage for equipment to be connected to a battery, shall be the nominal voltage of the battery (12 V, 24 V, etc.). For operation from other power sources, the normal test voltage shall be declared by the manufacturer.

The test conditions, configuration, and mode of operation shall represent the intended use and shall be recorded in the test report.