



SLOVENSKI STANDARD

SIST EN 301 843-1 V1.2.1:2005

01-maj-2005

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 301 843-1 V1.2.1:2005](https://standards.iteh.ai/catalog/standards/sist/7a81aca9-3354-490d-85c4-ea17e2386b92/sist-en-301-843-1-v1-2-1-2005)

[https://standards.iteh.ai/catalog/standards/sist/7a81aca9-3354-490d-85c4-](https://standards.iteh.ai/catalog/standards/sist/7a81aca9-3354-490d-85c4-ea17e2386b92/sist-en-301-843-1-v1-2-1-2005)

[ea17e2386b92/sist-en-301-843-1-v1-2-1-2005](https://standards.iteh.ai/catalog/standards/sist/7a81aca9-3354-490d-85c4-ea17e2386b92/sist-en-301-843-1-v1-2-1-2005)

Ta slovenski standard je istoveten z: EN 301 843-1 Version 1.2.1

ICS:

33.060.20	Sprejemna in oddajna oprema	Receiving and transmitting equipment
33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general
47.020.70	Navigacijska in krmilna oprema	Navigation and control equipment

SIST EN 301 843-1 V1.2.1:2005

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 301 843-1 V1.2.1:2005

<https://standards.iteh.ai/catalog/standards/sist/7a81aca9-3354-490d-85c4-ea17e2386b92/sist-en-301-843-1-v1-2-1-2005>

ETSI EN 301 843-1 V1.2.1 (2004-06)

Candidate Harmonized European Standard (Telecommunications series)

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 301 843-1 V1.2.1:2005](https://standards.iteh.ai/catalog/standards/sist/7a81aca9-3354-490d-85c4-ea17e2386b92/sist-en-301-843-1-v1-2-1-2005)

<https://standards.iteh.ai/catalog/standards/sist/7a81aca9-3354-490d-85c4-ea17e2386b92/sist-en-301-843-1-v1-2-1-2005>



Reference

REN/ERM-EMC-234-1

Keywords

EMC, maritime, radio, regulation**ETSI**

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 301 843-1 V1.2.1:2005<https://standards.iteh.ai/catalog/standards/sist/7a81aca9-3354-490d-85c4-ca17e2386b22/erm-emc-234-1-v1-2-1-2005>**Important notice**

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, send your comment to:

editor@etsi.org

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2004.
All rights reserved.

DECT™, **PLUGTESTS™** and **UMTS™** are Trade Marks of ETSI registered for the benefit of its Members.
TIPHON™ and the **TIPHON logo** are Trade Marks currently being registered by ETSI for the benefit of its Members.
3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

Contents

Intellectual Property Rights	5
Foreword.....	5
Introduction	6
1 Scope	9
2 References	10
3 Definitions and abbreviations.....	11
3.1 Definitions	11
3.2 Abbreviations	12
4 Test conditions	12
4.1 General	12
4.2 Arrangements for test signals	13
4.2.1 Arrangements for test signals at the input of transmitters.....	13
4.2.2 Arrangements for test signals at the output of transmitters.....	13
4.2.3 Arrangements for test signals at the input of receivers	13
4.2.4 Arrangements for test signals at the output of receivers	14
4.2.5 Arrangements for testing transmitter and receiver together (as a system)	14
4.3 RF exclusion band of radio communications equipment.....	14
4.4 Narrow band responses of receivers or receivers which are part of transceivers	15
4.5 Normal test modulation	16
5 Performance assessment.....	16
5.1 General	16
5.2 Equipment which can provide a continuous communication link	16
5.3 Equipment which does not provide a continuous communication link	17
5.4 Ancillary equipment	17
5.5 Equipment classification	18
6 Performance criteria	18
6.1 Performance criteria A for continuous phenomena applied to transmitters and receivers.....	18
6.2 Performance criteria B for transient phenomena applied to transmitters and receivers	19
6.3 Performance criteria C applied to power supply failure	19
6.4 Performance check	19
6.5 Performance criteria for equipment which does not provide a continuous communication link.....	19
6.6 Performance criteria for ancillary equipment tested on a stand alone basis	20
7 Applicability overview tables.....	20
7.1 EMC emission	20
7.2 Immunity	21
8 Methods of measurement and limits for EMC emissions	21
8.1 Test configuration.....	21
8.2 Enclosure of ancillary equipment measured on a stand alone basis	22
8.2.1 Definition.....	22
8.2.2 Test method	22
8.2.3 Limits.....	23
8.3 DC power input/output ports	23
8.3.1 Definition.....	23
8.3.2 Test method	23
8.3.3 Limits.....	24
8.4 AC mains power input/output ports	24
8.4.1 Definition.....	24
8.4.2 Test method	24
8.4.3 Limits.....	25
9 Test methods and levels for immunity tests	25

9.1	Test configuration.....	25
9.2	Radio frequency electromagnetic field (80 MHz to 2 000 MHz).....	26
9.2.1	Definition.....	26
9.2.2	Test method.....	26
9.2.3	Performance criteria.....	26
9.3	Electrostatic discharge.....	26
9.3.1	Definition.....	27
9.3.2	Test method.....	27
9.3.3	Performance criteria.....	27
9.4	Fast transients, differential and common mode.....	27
9.4.1	Definition.....	27
9.4.2	Test method.....	28
9.4.3	Performance criteria.....	28
9.5	Radio frequency, common mode.....	28
9.5.1	Definition.....	28
9.5.2	Test method.....	28
9.5.3	Performance criteria.....	29
9.6	Power supply variations.....	29
9.6.1	Power supply short term variations.....	29
9.6.1.1	Definition.....	29
9.6.1.2	Test method.....	29
9.6.1.3	Performance criteria.....	30
9.6.2	Power supply failure.....	30
9.6.2.1	Definition.....	30
9.6.2.2	Test method.....	30
9.6.2.3	Performance criteria.....	30
9.7	Surges.....	30
9.7.1	Definition.....	30
9.7.2	Test method.....	30
9.7.3	Performance criteria.....	31
Annex A (normative):	Clauses of the present document relevant for compliance with the essential requirements of EC Council Directives.....	32
Annex B (informative):	The EN title in the official languages.....	33
History.....		34

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://webapp.etsi.org/IPR/home.asp>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Candidate Harmonized European Standard (Telecommunications series) 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 Council Directive 98/34/EC [15] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulation.

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") (89/336/EEC [4] as amended), and 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 ("the R&TTE Directive" [5]).

Technical specifications relevant to the EMC Directive and the R&TTE Directive are given in annex A.

The present document is based upon the standard for marine navigational equipment EN 60945 [3], and other standards where appropriate, to meet the essential requirements of Council Directives 89/336/EEC [4] and 1999/5/EC [5] 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.

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 4: "Specific conditions for Narrow-Band Direct-Printing (NBDP) NAVTEX receivers";
- Part 5: "Specific conditions for MF/HF radiotelephone transmitters and receivers".

National transposition dates

Date of adoption of this EN:	4 June 2004
Date of latest announcement of this EN (doa):	30 September 2004
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2005
Date of withdrawal of any conflicting National Standard (dow):	31 March 2006

Introduction

The present document is part of a set of standards designed to fit in a modular structure to cover all radio and telecommunications terminal equipment under the R&TTE Directive [5]. Each standard is a module in the structure. The modular structure is shown in figure 1.

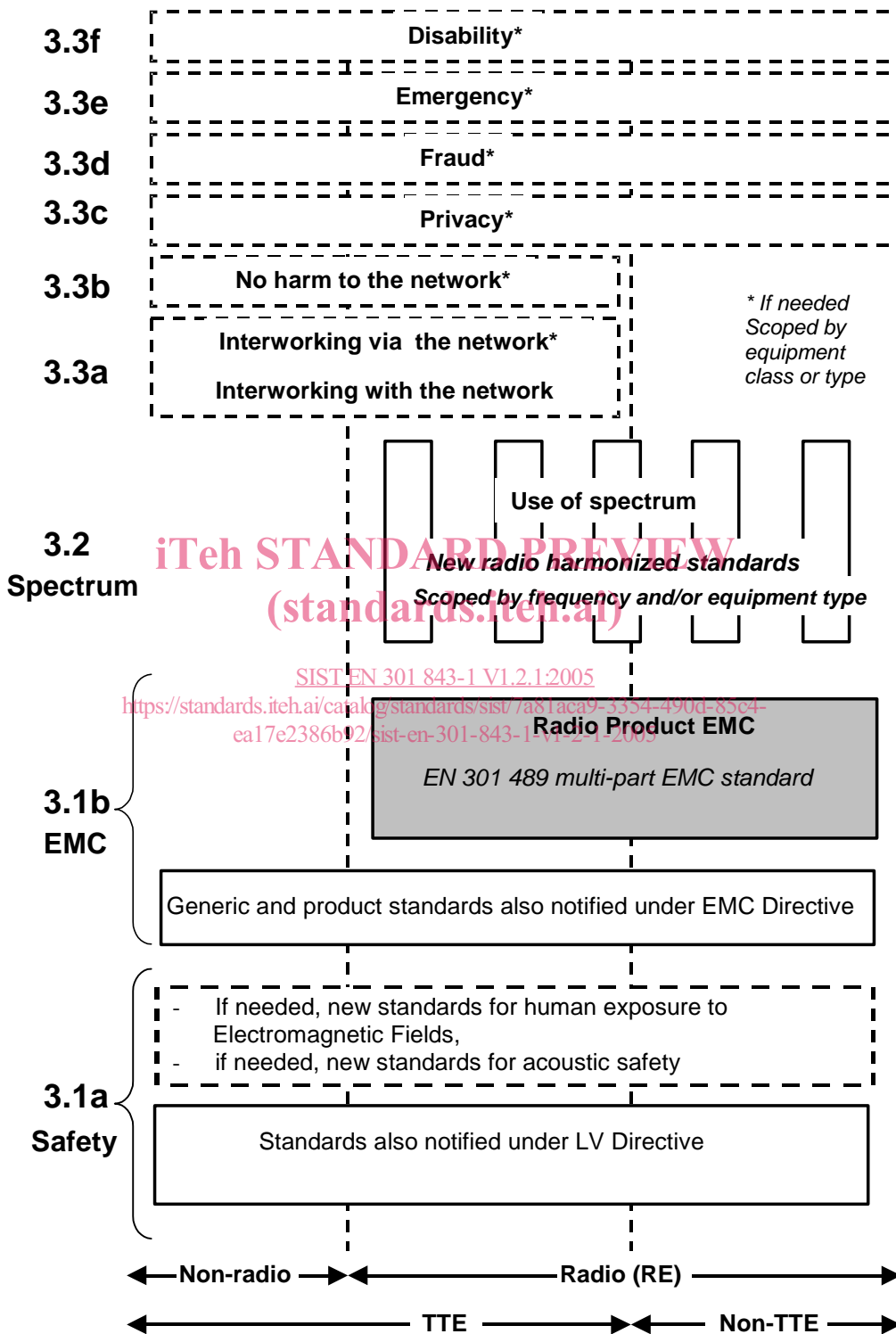


Figure 1: Modular structure for the various standards used under the R&TTE Directive

The left hand edge of the figure 1 shows the different clauses of article 3 of the R&TTE Directive [5].

For article 3.3 various horizontal boxes are shown. Dotted lines indicate that at the time of publication of the present document essential requirements in these areas have to be adopted by the Commission. If such essential requirements are adopted, and as far and as long as they are applicable, they will justify individual standards whose scope is likely to be specified by function or interface type.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum by radio equipment. The scopes of these standards are specified either by frequency (normally in the case where frequency bands are harmonized) or by radio equipment type.

For article 3.1b the diagram shows EN 301 489, the multi-part product EMC standard for radio used under the EMC Directive [4].

For article 3.1a the diagram shows the existing safety standards currently used under the LV Directive [16] and new standards covering human exposure to electromagnetic fields. New standards covering acoustic safety may also be required.

The bottom of the figure shows the relationship of the standards to radio equipment and telecommunications terminal equipment. A particular equipment may be radio equipment, telecommunications terminal equipment or both. A radio spectrum standard will apply if it is radio equipment. An article 3.3 standard will apply as well only if the relevant essential requirement under the R&TTE Directive [5] is adopted by the Commission and if the equipment in question is covered by the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the R&TTE Directive [5] may be covered in a set of standards.

The modularity principle has been taken because:

- it minimizes the number of standards needed. Because equipment may, in fact, have multiple interfaces and functions it is not practicable to produce a single standard for each possible combination of functions that may occur in an equipment;
- it provides scope for standards to be added:
 - under article 3.2 when new frequency bands are agreed; or
 - under article 3.3 should the Commission take the necessary decisions without requiring alteration of standards that are already published;
- it clarifies, simplifies and promotes the usage of Harmonized Standards as the relevant means of conformity assessment.

Figure 2 gives an enlargement of the EMC layer which is judged to be appropriate in view of this harmonized standard derivation.

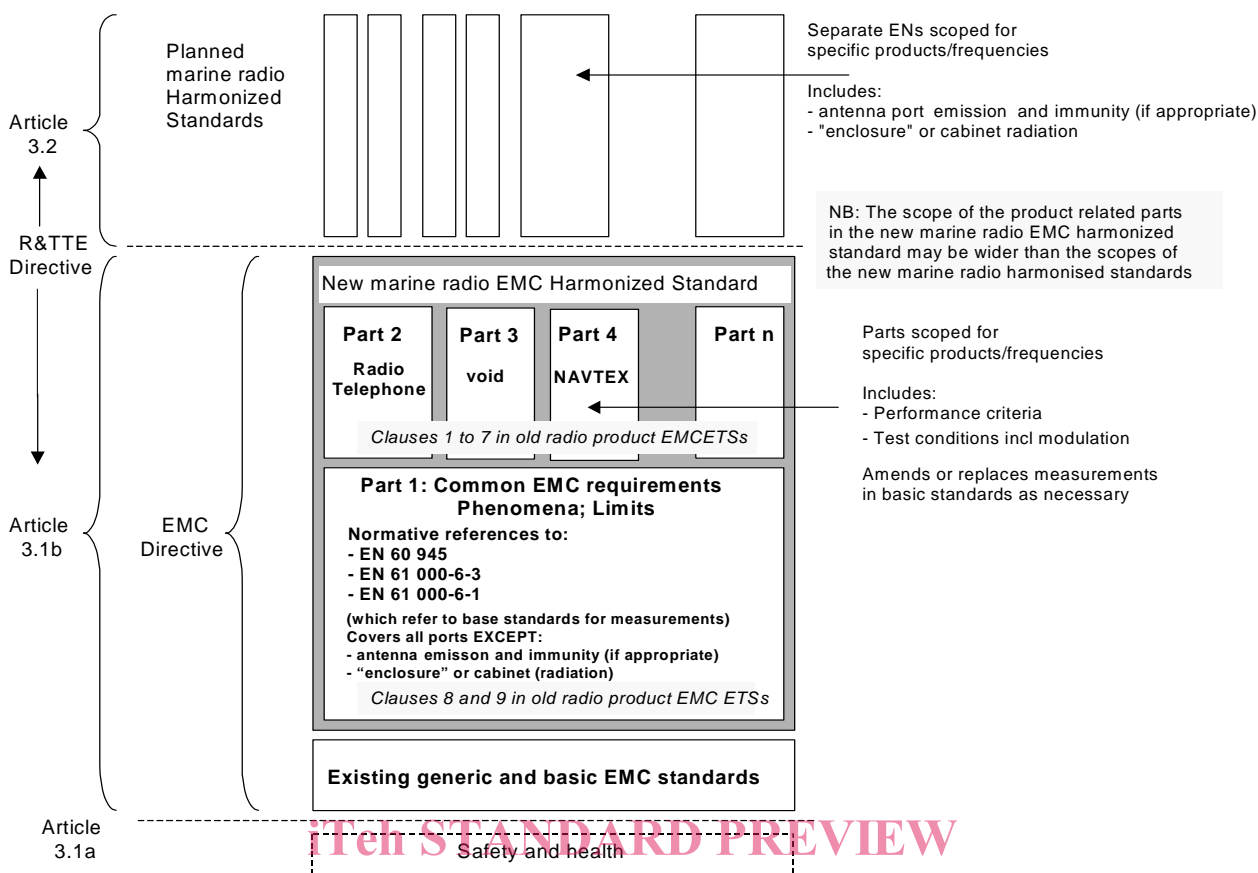


Figure 2: The new radio EMC harmonized standard

The current EMC product standards for marine radio equipment are all structured as follows:

<https://standards.iteh.ai/catalog/standards/sist/7a81aca9-3354-490d-85c4->

Clauses 1 to 6 contain information specific to the type of radio equipment covered by the present document:

- clause 1: Scope;
- clause 2: References;
- clause 3: Definitions and abbreviations;
- clause 4: Test conditions and configurations;
- clause 5: Performance assessment; and
- clause 6: Performance criteria.

Clause 7 contains the applicability overview tables for emission and immunity.

Clause 8 contains the emission requirements and clause 9 contains the immunity requirements. The requirements set out in these clauses are however identical for all types of marine radio equipment.

For these standards the following structure applies:

- the present document contains all common technical requirements for emission and immunity;
- separate parts cover product related specific marine radio equipment test conditions, test arrangements, performance criteria, normal test modulation, etc. Further work may be underway in the development of specific parts for other types of marine radio communications equipment;
- one new clause has been added to each of the specific radio parts of the present document entitled "Special conditions", if appropriate. This clause contains any deviation from the common requirements set out in the present document.

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 [6]).

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 [3] for marine navigational equipment,

that means to the maritime environment.

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

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

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

- [1] EN 61000-6-3 (2001): "Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments".
- [2] EN 61000-6-1 (2001): "Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments".
- [3] EN 60945 (2002): "Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results".
- [4] Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).
- [5] 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)
- [6] Council Directive 96/98/EC of 20 December 1996 on marine equipment.
- [7] CISPR 16-1 (2003): "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1: Radio disturbance and immunity measuring apparatus".
- [8] EN 61000-4-2 (1995): "Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test".
- [9] EN 61000-4-3 (1996): "Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test".
- [10] EN 61000-4-4 (1995): "Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test".
- [11] EN 61000-4-5 (1995): "Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test".
- [12] EN 61000-4-6 (1996): "Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields".
- [13] IEC 60050-161 (1990): "International Electrotechnical Vocabulary. Chapter 161: Electromagnetic compatibility".
- [14] CEPT/ERC Recommendation 74-01 (1998): "Spurious emissions".
- [15] 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.
- [16] Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).
- [17] IMO Convention: "International Convention for the Safety of Life at Sea (SOLAS)".