SLOVENSKI STANDARD
SIST EN 301 925 V1.1.1:2003

01-december-2003

Elektromagnetna združljivost in zadeve v zvezi z radijskim spektrom (ERM) ï Radiotelefonski oddajniki in sprejemniki za pomorsko mobilno storitev, ki obratujejo v pasovih VHF ï Tehniļne karakteristike in merilne metode

Electromagnetic compatibility and Radio spectrum Matters (ERM); Radiotelephone transmitters and receivers for the maritime mobile service operating in VHF bands; Technical characteristics and methods of measurement

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Electromagnetic compatibility and Radio spectrum Matters (ERM); Radiotelephone transmitters and receivers for the maritime mobile service operating in VHF bands; Technical characteristics and methods of measurement

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Foreword

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

National transposition dates	
Date of adoption of this EN:	20 September 2002
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1 Scope

The present document specifies the minimum requirements for shipborne radio transmitters and receivers for fixed installations operating in the VHF frequency bands between 156 MHz and 174 MHz allocated to the maritime mobile service, capable of Radiotelephony and Digital Selective Calling communications within the Global Maritime Distress and Safety System. The present document incorporates the requirements of the relevant resolutions of the International Maritime Organization (IMO) and is primarily intended to specify equipment suitable for fitting to ships subject to the SOLAS Convention [1] and complying with the European Marine Equipment Directive [2].

The EMC parameters defined in the clauses of the present document covering emission tests and immunity tests (see clauses 10 and 11) have been selected to ensure an adequate level of compatibility for apparatus in marine environments. Should the EMC requirements in this standard conflict with those of EN 60945 [17], then the requirements of this standard shall take precedence.

Compliance to the EMC 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 their test report any observations regarding the test sample becoming dangerous or unsafe as a result of the application of the tests called for herein.

The present document does not address the testing of ancillary equipment on a stand-alone basis, i.e. separately from the radio equipment with which it is to be used.

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.

[1] IMO SOLAS 1974: "International Convention for the Safety of Life at Sea" (Consolidated Edition 2001 incorporating all amendments in effect on 1 January 2001).

[2] Council Directive 96/98/EC of 20 December 1996 on marine equipment (as amended by Commission Directive 98/85/EC) (the European Marine Equipment Directive).

[3] IMO Resolution A.803(19) (as amended by MSC.68(68)): "Performance Standards for Shipborne VHF Radio Installations capable of Voice Communications and Digital Selective Calling".

[4] IMO Resolution A.524(13): "Performance Standards for VHF Multiple Watch Facilities".

[5] ITU Radio Regulations (1998).

[6] ITU Radio Regulations Appendix S18 (1998): "Table of transmitting frequencies in the VHF maritime mobile band".

[7] ITU-R Recommendation M.489-2 (1995): "Technical characteristics of VHF radiotelephone equipment operating in the maritime mobile service in channels spaced by 25 kHz".

[8] ITU-R Recommendation M.493-10 (2000): "Digital selective-calling system for use in the maritime mobile service".

[9] ITU-R Recommendation M.541-8 (1997): "Operational procedures for the use of digital selective-calling equipment in the maritime mobile service".

[10] ITU-R Recommendation SM.329-8 (2000): "Spurious emissions".

[11] ITU-R Recommendation SM.332-4 (1978): "Selectivity of receivers".

[12] ITU-T Recommendation E.161 (1995): "Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network".

[13] ITU-T Recommendation O.41 (1994): "Psophometer for use on telephone-type circuits".

[14] CISPR 16-1 (1999): "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1: Radio disturbance and immunity measuring apparatus".

[15] ETSI ETR 028 (Edition 2): "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".

[16] ETSI EN 300 338 (V1.2.1): "ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Technical characteristics and methods of measurement for equipment for generation, transmission and reception of Digital Selective Calling (DSC) in the maritime MF, MF/HF and/or VHF mobile service".

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

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

[19] IEC 61000-4-3 (2002): "Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test".

[20] EN 61000-4-4 (1995) amended by Am1 (2001): "Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test".

[21] IEC 61000-4-5 (2001): "Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test".

[22] IEC 61000-4-6 (2001): "Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields".

[23] IEC 61000-4-11 (Ed.1.1) (2001): "Electromagnetic compatibility (EMC) - Part 4-11: Testing and measuring techniques - Voltage dips, short interruptions and voltage variations immunity tests".

[24] EN 61162-1 (2000): "Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 1: Single talker and multiple listeners".

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

3 Definitions, symbols 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 transmitter or receiver is considered to be an ancillary equipment if:

- the equipment is intended for use in conjunction with a transmitter or receiver to provide additional operational 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 the radio equipment; and
- the radio equipment to which it is connected is capable of providing some intended operation, such as transmitting or receiving, without the ancillary equipment (i.e. it is not a sub-unit of the radio equipment essential to the basic functions of the radio equipment).

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 (see IEC 60050-161)

duplex operation: operating method in which transmission is possible simultaneously in both directions of a telecommunications channel

effective radiated power: product of the power supplied to the antenna and its gain relative to a half-wave dipole (see ITU Radio Regulations)

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.

G3E: phase-modulation (frequency modulation with a pre-emphasis of 6 dB/octave) for speech operation

G2B: phase-modulation (frequency modulation with a pre-emphasis of 6 dB/octave) for Digital Selective Calling (DSC) operation

NOTE: The carrier is modulated by a sub-carrier which is FSK modulated by digital data.

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.

mobile equipment: marine receiver, transmitter or transmitter/receiver (transceiver) intended for installation and use onboard ships, and powered by the ship's supply

modulation index: ratio between the frequency deviation and the frequency of the modulating audio signal

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

performance check: check of the transmitter frequency error, carrier power, audio frequency harmonic distortion of emission (see clauses 8.2, 8.3 and 8.4 of EN 301 925); and receiver sensitivity (see clause 8.5 of EN 301 925)

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).

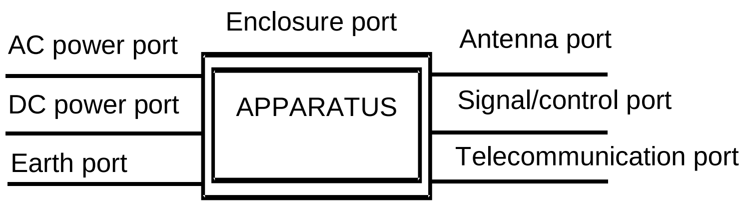

Figure 1: EUT Ports for EMC purposes

Q ratio: ratio of an observed magnitude of acceleration at the equipment to the magnitude of acceleration at the base of the vibration table

radio communications equipment: marine communications equipment which includes one or more radio transmitters or receivers or parts thereof, for use in a mobile application onboard ship

NOTE: Such equipment may be operated with ancillary equipment but, if so, is not dependent upon it for basic functionality.

semi-duplex operation: operating method in which simplex operation is used at one end of the circuit and duplex operation at the other

simplex: operating method in which transmission is made possible alternately in each direction of a telecommunications channel, for example, by means of manual control

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 (see ITU Radio Regulations [5]).

switching range: maximum frequency range over which the receiver or the transmitter can be operated without reprogramming or realignment

transient phenomena: 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 (see IEC 60050-161)

3.2 Symbols

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

dBA	sound pressure relative to 2×10^{-5} Pa
dBd	antenna gain relative to a half-wave dipole
λ	lambda (wavelength)
Q	mechanical resonance

3.3 Abbreviations

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

AC	Alternating Current
DC	Direct Current
DSC	Digital Selective Calling
EMC	ElectroMagnetic Compatibility
emf	electromotive force
ESD	Electrostatic Discharge
EUT	Equipment Under Test