SLOVENSKI STANDARD
SIST EN 301 466:2001

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Elektromagnetna združljivost (EMC) in zadeve v zvezi z radijskim spektrom (ERM) - Tehniļne karakteristike in merilne metode za radiotelefonske naprave VHF, ki so fiksno vgrajene na reģilnih ļolnih

ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Technical characteristics and methods of measurement for two-way VHF radiotelephone apparatus for fixed installation in survival craft

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Electromagnetic compatibility and Radio spectrum Matters (ERM); Technical characteristics and methods of measurement for two-way VHF radiotelephone apparatus for fixed installation in survival craft

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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:	13 October 2000
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1 Scope

The present document states the minimum technical characteristics required for VHF radiotelephone equipment, operating in the bands between 156 MHz and 174 MHz allocated to the Maritime Mobile Services and suitable for fixed installations in survival craft in accordance with the provisions of the Global Maritime Distress and Safety System (GMDSS). The relevant requirements detailed in the Radio Regulations [1], International Convention for the Safety Of Life At Sea SOLAS 1974 [6] and the International Maritime Organization Resolutions A.694 [3] and A.809 [2] as well as all relevant requirements of EN 60945 [9] are incorporated 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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] Radio Regulations 1998, Appendix S-18: "Table of transmitting frequencies in the VHF maritime mobile band".

[2] International Maritime Organization Resolution A.809 (19): "Performance standards for survival craft two way VHF radiotelephone apparatus".

[3] International Maritime Organization Resolution A.694 (17): "General requirements for ship-borne radio equipment forming part of the Global Maritime Distress and Safety System (GMDSS)".

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

[5] ITU-T Recommendation P.53 (1994): "Psophometer for use on telephone-type circuits".

[6] SOLAS 1974: "International Maritime Organization (IMO), International Convention for the Safety Of Life At Sea (SOLAS), (1974 as amended)".

[7] IEC 60068-2-27: "Environmental testing. Part 2: Tests. Test Ea and guidance: Shock".

[8] ETSI ETR 273: "Electromagnetic Compatibility and radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement incertainties".

[9] EN 60945 (1997): "Maritime navigation and radio communication equipment and systems - General requirements - Methods of testing and required test results".

[10] ISO Recommendation 694 (1968): "Ships and marine technology - Positioning of magnetic compasses in ships ".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

modulation index: ratio of the frequency deviation to the modulation frequency

rated output power: output power as defined by the manufacturer

3.2 Symbols

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

dBA	Acoustic level in dB relative to 2×10^{-5} Pascal
g	Acceleration of gravity (≈ 9,81 m/s2)
G3E	Phase modulation for voice
Q	Ratio of an observed acceleration at the equipment to the acceleration at the base of the vibration table

3.3 Abbreviations

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

ad	amplitude difference
DSC	Digital Selective Calling
emf	electro-motive force
ERP	Effective Radiated Power
EUT	Equipment under test
fd	frequency difference
GMDSS	Global Maritime Distress and Safety System
IF	Intermediate Frequency
RF	Radio Frequency
rms	root mean square
SINAD	(Signal + Noise + Distortion)/(Noise + Distortion) ratio
SOLAS	International Convention for the Safety of Life at Sea

4 General requirements

4.1 Construction

The equipment shall be capable of being used for on-scene communications between survival craft, between survival craft and ship and between survival craft and rescue unit.

The equipment shall comprise at least:

- a transmitter and receiver;
- an antenna which may be fixed to the equipment or mounted separately; and
- a microphone with press-to-talk switch and a loudspeaker.

The equipment shall be fitted with an external 50 Ω antenna connector.

The equipment may be operated from an external or integrated power source. An integrated power source may consist of primary or secondary batteries.

The mechanical and electrical construction and finish of the equipment shall conform in all respects to good engineering practice and the equipment shall be suitable for use in survival craft at sea.

All controls shall be of sufficient size to enable the usual control functions to be easily performed by a user wearing gloves for immersion suits, in accordance with SOLAS 1974 [6] Chapter III, Regulation 33. The number of controls should be the minimum necessary for simple and satisfactory operation.

Any parts of the equipment required to be checked during inspection or maintenance operations as laid down by the manufacturer, shall be readily accessible. Components shall be readily identifiable.

For the purpose of conformance testing in accordance with the present document, adequate technical and operational documentation shall be supplied with the equipment.

4.2 Frequencies and power

The equipment shall operate only on single-frequency channels for voice communications with manual control (simplex).

The equipment shall provide for transmission and reception of signals on channel 16 and at least one other single frequency channel from those specified in Appendix S-18 of the Radio Regulations [1], (with the exception of the DSC calling channel 70).

Independent selection of transmitting and receiving frequencies shall not be possible.

After switch on the equipment shall be operational within 5 seconds.

It shall not be possible to transmit during channel switching operations.

4.3 Controls

The equipment shall have a channel selector and shall indicate the designator of the channel at which the equipment is set, as given in Appendix S-18 of the Radio Regulations [1].

It shall be possible to determine that channel 16 has been selected in all ambient light conditions.

The equipment shall have the following additional controls:

- on/off switch for the equipment with a visual indication that the equipment is switched on;
- a manual non-locking push to talk switch to operate the transmitter;
- if the transmitter ERP is greater than 1 watt, a switch for reducing the power to a level not exceeding 1 watt ERP;
- an audio-frequency volume control;
- a squelch control;
- a carrier power detector giving a visual indication that the carrier is being produced.

The user shall not have access to any control which may impair the technical characteristics of the equipment if wrongly set.

4.4 Switching time

The channel switching arrangements shall be such that the time necessary to change over from using one of the channels to using any other channel does not exceed 5 seconds.

The time necessary to change over from transmission to reception and vice versa, shall not exceed 0,3 seconds.

4.5 Safety precautions

Means shall be incorporated to prevent damage to the equipment due to reversal of polarity of the battery power supply.

The equipment shall be designed to be free of sharp projections which could damage survival craft.

The equipment shall not be damaged by the effects of an open circuit or a short circuit of the antenna.

4.6 Class of emission and modulation characteristics

The equipment shall use phase modulation, G3E (frequency modulation with a pre-emphasis of 6 dB/octave) for speech.

The equipment shall be designed to operate satisfactorily to the requirements of the present document with a channel separation of 25 kHz.

4.7 Battery

Equipment with integral power supply shall be capable of operating with primary or secondary batteries.

Primary batteries shall have a shelf life of at least two years.

The capacity of integral primary battery shall be sufficient to operate the equipment continuously for at least eight hours at any temperature condition (see subclauses 5.3.1 and 5.4.1) with a 1 : 9 transmit-to receive duty cycle at the highest rated transmit power.

This duty cycle is defined as:

- 6 s transmit at full RF output power without modulation, 6 s reception with an RF input signal at the nominal frequency of the receiver at a level of +60 dBμV using normal test modulation (subclause 6.4); and
- the audio volume control of the receiver set at maximum followed by 48 s reception without input signal and the squelch control operational (muted).

Provisions shall be made for replacing the battery easily without the use of special tools and without degrading the performance of the equipment (particularly water tightness after re-assembly).

If the equipment is capable of operation with secondary batteries, see clause 10.

4.8 Labelling

All controls and indicators shall be clearly labelled.

The equipment shall be clearly labelled with brief instructions for operation.

The equipment shall be clearly marked on the exterior with identification of the manufacturer, type designation and serial number.

The compass safe distance measured in accordance with ISO Recommendation 694 [10], shall be stated on the equipment or in the user document supplied with the equipment.

The type and designation of any integrated battery used, and the expiry date of any primary battery shall be clearly labelled.

Details of the power supply from which the equipment is intended to operate shall be clearly indicated on the equipment.

5 Test conditions, power sources and ambient temperatures

5.1 Normal and extreme test conditions

Conformance testing shall be made under normal test conditions and also, where stated, under extreme test conditions.

5.2 Test power source

During conformance testing, the equipment shall be supplied from a test power source capable of producing normal and extreme test voltages as specified in subclauses 5.3.2 and 5.4.2. The tests power source shall only be used in measurements where its effect on the test results shall be negligible. For the purpose of testing the power source voltage shall be measured at the input terminals of the equipment.

During testing, the power source voltages shall be maintained within a tolerance of ±3 % relative to the voltage level at the beginning of each test.

For equipment with integrated batteries, the test power source shall only be used in measurements where the use of the test power source is mutually agreed between manufacturer and test house. In the event of any discrepancy, results obtained using the batteries shall take precedence over results obtained using the test power source.

5.3 Normal test conditions

5.3.1 Normal temperature and humidity

The normal temperature and humidity conditions for tests shall be a combination of temperature and humidity within the following limits:

- temperature: +15°C to +35°C;
- relative humidity: 20 % to 75 %.

5.3.2 Normal power sources

5.3.2.1 External battery power source

When the equipment is designed to operate from an external battery, the normal test voltage shall be the nominal voltage of the battery (12 V, 24 V, etc.).

5.3.2.2 Integrated battery power source

The normal test voltage shall be the nominal voltage of the battery as declared by the manufacturer.