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*Candidate Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
ElectroMagnetic Compatibility (EMC)  
standard for marine radio equipment and services;  
Part 4: Specific conditions for Narrow-Band  
Direct-Printing (NBDP) NAVTEX receivers**

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Reference

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# Contents

Intellectual Property Rights .....	4
Foreword.....	4
1 Scope .....	5
2 References .....	5
3 Definitions, symbols and abbreviations .....	6
3.1 Definitions .....	6
3.2 Symbols.....	6
3.3 Abbreviations .....	6
4 Test conditions .....	6
4.1 General .....	6
4.2 Arrangements for test signals .....	6
4.2.1 Arrangements for test signals at the input of the receiver .....	6
4.2.2 Arrangements for test signals at the output of the receiver .....	7
4.3 Exclusion bands.....	7
4.3.1 Exclusion bands for receivers .....	7
4.4 Narrow band responses on receivers .....	7
4.5 Normal test modulation .....	7
5 Performance assessment.....	7
5.1 General .....	7
5.2 Equipment which can provide a continuous communication link .....	8
5.3 Ancillary equipment .....	8
5.4 Equipment classification .....	8
6 Performance criteria .....	8
6.1 Performance criteria A for continuous phenomena applied to receivers .....	8
6.2 Performance criteria B for transient phenomena applied to receivers .....	8
6.3 Performance criteria C applied to power supply failure .....	9
6.4 Performance check .....	9
6.4.1 Receiver .....	9
6.5 Performance criteria for equipment which does not provide a continuous communication link.....	9
7 Applicability overview .....	9
7.1 Emission.....	9
7.1.1 General.....	9
7.1.2 Special conditions.....	9
7.2 Immunity .....	9
7.2.1 General.....	9
7.2.2 Special conditions.....	10
<b>Annex A (informative):</b> <b>Examples of types of Narrow-Band Direct-Printing (NBDP) NAVTEX equipment in the scope of the present document .....</b>	<b>11</b>
A.1 Narrow-Band Direct-Printing (NBDP) NAVTEX receivers operating in the maritime mobile service.....	11
<b>Annex B (informative):</b> <b>The EN title in the official languages .....</b>	<b>12</b>
History .....	13

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## Foreword

This Candidate Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the Public Enquiry phase of the ETSI standards Two-step Approval Procedure.

The present document has been produced by ETSI in response to a mandate from the European Commission issued under the Council Directive 98/34/EC [6] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulation.

The present document, together with EN 301 843-1 [1], 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 [3] as amended), and the Council Directive on the approximation of the laws of the Member States relating to radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (the "R&TTE Directive" 1999/5/EC [2]).

The present document is part 4 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

<b>Proposed national transposition dates</b>	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	36 months after doa

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# 1 Scope

The present document together with EN 301 843-1 [1] covers the assessment of Narrow-Band Direct-Printing (NBDP) NAVTEX receivers operating in the maritime mobile service, and ancillary equipment in respect of ElectroMagnetic Compatibility (EMC).

Technical specifications related to the antenna port and emissions from the enclosure port of NAVTEX receivers are not included in the present document. Such technical specifications are found in the related product standard EN 300 065-2 [4] for the effective use of the radio spectrum.

The present document specifies the applicable test conditions, performance assessment and performance criteria for NAVTEX receivers operating in the maritime mobile service and the associated ancillary equipment.

In case of differences (for instance concerning special conditions, definitions, abbreviations) between the present document and EN 301 843-1 [1], the provisions of the present document take precedence.

The electromagnetic environment used in the present document to develop the technical specifications encompasses the electromagnetic environment onboard ships as identified in EN 60945 [5].

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# 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] ETSI EN 301 843-1 (V1.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services; Part 1: Common technical requirements".
- [2] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications equipment and the mutual recognition of their conformity (R&TTE Directive).
- [3] 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).
- [4] ETSI EN 300 065-2 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Narrow-band direct-printing telegraph equipment for receiving meteorological or navigational information (NAVTEX); Part 2: Harmonized EN under article 3.2 of the R&TTE directive".
- [5] EN 60945 (2002): "Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results".
- [6] 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.
- [7] ETSI EN 300 065-3 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Narrow-band direct-printing telegraph equipment for receiving meteorological or navigational information (NAVTEX); Part 3: Harmonized EN under article 3.3 (e) of the R&TTE directive".

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 301 843-1 [1], clause 3, apply.

### 3.2 Symbols

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

emf	electromotive force
rms	root mean square

### 3.3 Abbreviations

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

CER	Character Error Rate
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
RF	Radio Frequency
NBDP	Narrow-Band Direct-Printing

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## 4 Test conditions

For the purposes of the present document, the test conditions of EN 301 843-1 [1], clause 4, shall apply as appropriate. Further product related test conditions for NAVTEX receivers are specified in the present document.

### 4.1 General

The provisions of EN 301 843-1 [1], clause 4.1 shall apply with the following modifications.

For emission and immunity tests the normal test modulation, test arrangements, etc., as specified in the present document, clauses 4.1 to 4.5, shall apply.

All tests shall be performed with the wanted RF input signal on the operating frequency 490 kHz or 518 kHz as appropriate, unless stated otherwise.

### 4.2 Arrangements for test signals

The provisions of EN 301 843-1 [1], clause 4.2 shall apply.

#### 4.2.1 Arrangements for test signals at the input of the receiver

The provisions of EN 301 843-1 [1], clause 4.2.3 shall apply with the following modifications.

The wanted RF input signal, coupled to the receiver, shall be modulated with normal test modulation as specified for that type of equipment (see clause 4.5 of the present document).

The level of the wanted signal shall be 40 dB $\mu$ V (emf) unless indicated otherwise.

## 4.2.2 Arrangements for test signals at the output of the receiver

The output of the receiver consists of the printout of transmitted messages.

During immunity tests with continuous RF test signals, the output of the receiver shall be monitored, e.g. by means of a camera coupled to a monitor located outside the test environment, for the verification of continuous printing.

## 4.3 Exclusion bands

The frequencies on which NAVTEX receivers are intended to operate, shall be excluded from conducted and radiated RF immunity tests.

There shall be no frequency exclusion band applied to emission measurements of NAVTEX receivers, and/or associated ancillary equipment.

The immunity test exclusions are referred to as "exclusion band" and are defined in clause 4.3.1 of the present document.

### 4.3.1 Exclusion bands for receivers

The exclusion band for NAVTEX receivers is the frequency range 462 kHz to 545 kHz.

## 4.4 Narrow band responses on receivers

The provision of EN 301 843-1 [1], clause 4.4 shall apply with the following modifications.

No immunity tests shall be carried out on frequencies of identified narrow band responses on NAVTEX receivers.

An increase of the Character Error Rate (CER) above the value of  $4 \times 10^{-2}$  shall be used as criterion for the identification of any unwanted responses.

The nominal frequency offset to be used for the identification of narrowband responses shall be  $\pm 1$  kHz for the first part of the identification procedure, and  $\pm 1,25$  kHz for its second part.

All narrowband responses shall be disregarded from immunity tests.

## 4.5 Normal test modulation

The normal wanted RF test signal shall be an F1B radio-frequency signal modulated with a frequency shift of  $\pm 85$  Hz centred on 490 kHz or 518 kHz as appropriate.

It shall contain signals providing the following traffic information:

- 1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U - Carriage return - Line feed.

For tests with the normal wanted RF test signal, the above information shall be transmitted at least 35 times continuously.

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# 5 Performance assessment

## 5.1 General

The manufacturer shall at the time of submission of the equipment for test, supply the necessary general information as requested in EN 301 843-1 [1], clause 5.1.

## 5.2 Equipment which can provide a continuous communication link

The provisions of EN 301 843-1 [1], clause 5.2 shall apply with the following modification.

For immunity tests, the wanted input signal, coupled to the receiver, shall be the normal wanted RF test signal (see clause 4.5). Before each test, this signal (see clause 4.5) shall be applied to the EUT to check the correct functioning and to load the message header memory. The user memories shall be loaded with appropriate test data. During the immunity tests, the normal wanted RF test signal shall be preceded by a different header.

## 5.3 Ancillary equipment

The provisions of EN 301 843-1 [1], clause 5.4 shall apply.

## 5.4 Equipment classification

NAVTEX receivers belong solely to the category of mobile marine radio equipment.

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# 6 Performance criteria

For immunity tests, the wanted input signal, coupled to the receiver, shall be the normal wanted RF test signal (see clause 4.5). Before each test, this signal (see clause 4.5) shall be applied to the EUT to check the correct functioning and to load the message header memory. The user memories shall be loaded with appropriate test data. During the immunity tests, the normal wanted RF test signal shall be preceded by a different header.

The equipment shall meet the performance criteria as specified in clauses 6.1, 6.2, 6.3, 6.4 and 6.5, as appropriate.

## 6.1 Performance criteria A for continuous phenomena applied to receivers

During the test the EUT shall continue to print.

After the test the print shall be examined. The Character Error Rate (CER) in the printed output shall be below  $4 \times 10^{-2}$ .

After the test the wanted RF test signal shall be applied to the EUT using the same header as used preceding the test. The test signal shall not be printed.

After the test the data in the user memories shall be checked. The data shall be unchanged from that loaded preceding the test.

## 6.2 Performance criteria B for transient phenomena applied to receivers

If during the test the printing stops, one more RF test signal with the same header shall be applied to the EUT and this test signal shall be printed.

If during the test the printing does not stop, at the conclusion of the test the following shall be carried out:

- a wanted RF test signal shall be applied to the EUT using the same header as used preceding the test. This test signal shall not be printed;
- a wanted RF test signal shall be applied to the EUT using a new header. This test signal shall be printed.

After the test the data in the user memories shall be checked. The data shall be unchanged from that loaded preceding the test.



## 6.3 Performance criteria C applied to power supply failure

After the test, the EUT shall enter receive mode without operator intervention.

After the test the data in the user memories shall be checked. The data shall be unchanged from that loaded preceding the test.

## 6.4 Performance check

### 6.4.1 Receiver

For the purpose of the present document a "performance check" of the receiver is taken to mean a measurement of the receiver's Character Error Rate (CER) with the normal wanted RF test signal (see clause 4.5) applied to the receiver input using a fixed input level of 40 dB $\mu$ V (emf).

The Character Error Rate shall be less than  $4 \times 10^{-2}$ .

## 6.5 Performance criteria for equipment which does not provide a continuous communication link

The provisions of EN 301 843-1 [1], clause 6.5 shall apply.

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# 7 Applicability overview

## 7.1 Emission

### 7.1.1 General

EN 301 843-1 [1], table 1, contains the applicability of EMC emission measurements to the relevant parts of marine radio and/or associated ancillary equipment.

### 7.1.2 Special conditions

No special conditions shall apply to EMC emission measurements on NAVTEX receivers in the scope of the present document.

## 7.2 Immunity

### 7.2.1 General

EN 301 843-1 [1], table 2, contains the applicability of EMC immunity measurements to the relevant parts of marine radio and/or associated ancillary equipment.

## 7.2.2 Special conditions

The following special conditions set out in table 1, relate to the immunity test methods and performance criteria used in EN 301 843-1 [1], clause 9.

**Table 1: Special conditions for EMC immunity tests**

Reference to clauses in EN 301 843-1 [1]	Special product-related conditions, additional to or modifying the test conditions in EN 301 843-1 [1], clause 9
<b>9.2.2: Test method; Radio frequency electromagnetic field</b>	<b>Wanted RF input signal for the receiver under test:</b> A receiver RF input level of 40 dB $\mu$ V (emf) shall be used during the test.
<b>9.5.2: Test method; Radio frequency, Common mode</b>	<b>Wanted RF input signal for the receiver under test:</b> A receiver RF input level of 40 dB $\mu$ V (emf) shall be used during the test.

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## Annex A (informative): Examples of types of Narrow-Band Direct-Printing (NBDP) NAVTEX equipment in the scope of the present document

The provisions of the present document apply to Narrow-Band Direct-Printing (NBDP) NAVTEX receivers intended for operation in the maritime mobile service, and associated ancillary equipment, as set out in the following clause.

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### A.1 Narrow-Band Direct-Printing (NBDP) NAVTEX receivers operating in the maritime mobile service

The present document applies to Narrow-Band Direct-Printing (NBDP) NAVTEX receivers operating in the maritime mobile service as defined in EN 300 065-2 [4] and EN 300 065-3 [7].

## Annex B (informative): The EN title in the official languages

Language	EN title
Danish	Elektromagnetisk kompatibilitet og Radiospektrum Anliggender (ERM); Elektromagnetisk kompatibilitet (EMC) for radioudstyr og tjenester; Del 4: Særlige krav til smalbands NAVTEX modtagere med direkte udskrift (NBDP)
Dutch	Elektromagnetische compatibiliteit en radiospectrumzaken (ERM); ElectroMagnetic Compatibility (EMC) norm voor maritieme radioapparatuur en diensten; Deel 4: Specifieke voorwaarden voor Narrow-Band Direct-Printing (NBDP) NAVTEX ontvangers
English	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for marine radio equipment and services; Part 4: Specific conditions for Narrow-Band Direct-Printing (NBDP) NAVTEX receivers
Finnish	Sähkömagneettinen yhteensopivuus ja radiospektriasiat (ERM); sähkömagneettinen yhteensopivuusstandardi merenkulun radiolaitteille; Osa 4: Erityisvaatimukset NAVTEX vastaanottimille
French	CEM et spectre radioélectrique (ERM); Compatibilité électromagnétique pour les équipements de communication radio maritime et services; Partie 4: conditions particulières pour les récepteurs NAVTEX en bande étroite à impression directe fonctionnant dans le service maritime mobile
German	Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM); Elektromagnetische Verträglichkeit (EMV) für Seefunkrichtungen und -dienste; Teil 4: Spezifische Bedingungen für direkt druckende Schmalband-Funkempfänger (NBDP / NAVTEX)
Greek	Ηλεκτρομαγνητική συμβατότητα και θέματα ραδιοφάσματος (ERM) - Πρότυπο ηλεκτρομαγνητικής συμβατότητας (EMC) για θαλάσσιες ραδιοσυσκευές και ραδιοϋπηρεσίες - Μέρος 4: Είδικες συνθήκες για δέκτες στενοζωνικής άμεσης εκτύπωσης (NBDP) NAVTEX
Italian	Compatibilità elettromagnetica e Questioni relative allo spettro delle radiofrequenze (ERM); Norma di Compatibilità elettromagnetica (EMC) norma per apparecchiature e servizi radio marittimi; Parte 4: Condizioni specifiche per ricevitori NAVTEX in banda stretta a stampa diretta (NBDP)
Portuguese	Assuntos de Espectro Radioeléctrico e Compatibilidade Electromagnética (ERM); Norma de Compatibilidade Electromagnética (EMC) para serviços e equipamentos marítimos; Parte 4: Condições específicas para receptores NAVTEX de Impressão-Directa em Faixa-Estreta (NBDP)
Spanish	Compatibilidad Electromagnética y cuestiones de Espectros Radiofrecuencia (ERM); Compatibilidad Electromagnética (EMC) estándares para equipos radio marítimos y sus servicios; Parte 4: Condiciones específicas para receptores NAVTEX (NBDP) de banda estrecha e impresión directa
Swedish	Elektromagnetisk kompatibilitet och radiospektrumfrågor (ERM); Elektromagnetisk kompatibilitetsstandard (EMC) för marinradioutrustning och -tjänster; Del 4: Specifika villkor för smalbandig direktskrivande (NBDP) NAVTEX-mottagare

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## History

<b>Document history</b>		
V1.1.1	February 2001	Publication
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