
Maritime navigation and radiocommunication equipment and systems - Shipborne voyage data recorder (VDR) - Performance requirements - Methods of testing and required test results (IEC 61996:2000)

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EUROPEAN STANDARD

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**Maritime navigation and radiocommunication equipment and systems -
Shipborne voyage data recorder (VDR) -
Performance requirements -
Methods of testing and required test results
(IEC 61996:2000)**

Matériels et systèmes de navigation et
de radiocommunication maritimes -
Enregistreurs de données de voyage
(VDR) de bord -
Exigences de fonctionnement -
Méthodes d'essai et résultats d'essai
exigés
(CEI 61996:2000)

Navigations- und Funkkommunikations-
geräte und -systeme für die Seeschifffahrt -
Fahrtdatenaufzeichnungsgerät auf
Seeschiffen (VDR) -
Leistungsanforderungen -
Prüfverfahren und geforderte
Prüfergebnisse
(IEC 61996:2000)

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This European Standard was approved by CENELEC on 2000-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 80/248/FDIS, future edition 1 of IEC 61996, prepared by IEC TC 80, Maritime navigation and radiocommunication equipment and systems, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61996 on 2000-09-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2001-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2003-09-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annexes A, B and C are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61996:2000 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60936-1 NOTE: Harmonized as EN 60936-1:2000 (not modified).

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-27	1987	Basic environmental testing procedures Part 2: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993
IEC 60268-16	1998	Sound system equipment Part 16: Objective rating of speech intelligibility by speech transmission index	EN 60268-16	1998
IEC 60651	1979	Sound level meters	EN 60651	1994
IEC 60945	1996	Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results	EN 60945	1997
IEC 61097-2	1994	Global maritime distress and safety system (GMDSS) Part 2: COSPAS-SARSAT EPIRB - Satellite emergency position indicating radio beacon operating on 406 MHz - Operational and performance requirements, methods of testing and required test results	-	-
IEC 61097-5	1997	Part 5: Inmarsat-E - Emergency position indicating radio beacon (EPIRB) operating through the Inmarsat system - Operational and performance requirements, methods of testing and required test results	-	-
IEC 61097-7	1996	Part 7: Shipborne VHF radiotelephone transmitter and receiver - Operational and performance requirements, methods of testing and required test results	-	-
IEC 61162	Series	Maritime navigation and radiocommunication equipment and systems - Digital interfaces	EN 61162	Series
IEC 61260	1995	Electroacoustics - Octave-band and fractional-octave-band filters	EN 61260	1995

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IMO A.658	1989	Use and fitting of retro-reflective materials on life-saving appliances	-	-
IMO A.662	1989	Performance standards for float-free release and activation arrangements for emergency radio equipment	-	-
IMO A.689	1991	Testing of life saving appliances	-	-
IMO A.694	1991	General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids	-	-
IMO A.810	1995	Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating on 406 MHz	-	-
IMO A.812	1995	Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating through the geostationary INMARSAT satellite system on 1,6 GHz	-	-
IMO A.830	1995	Code on alarms and indicators	-	-
IMO A.861	1997	Performance standards for shipborne voyage data recorders (VDRs)	-	-
IMO	1974	Convention on Safety of Life at Sea (SOLAS), as amended	-	-
ITU-R M.632-3	1997	Transmission characteristics of a satellite emergency position-indicating radio beacon (satellite EPIRB) system operating through geostationary satellites in the 1,6 GHz band	-	-
ITU-R M.633-1	1990	Transmission characteristics of a satellite emergency position-indicating radiobeacon (satellite EPIRB) system operating through a low polar-orbiting satellite system in the 406 MHz band	-	-
Eurocae		Minimum operational performance specification (MOPS) for cockpit voice recorder system	-	-
VESA	1996	Video electronics standards association - Discrete monitor timings standard 1.0, Revision 0.7 (DMTS)	-	-
SAE AS8045	1988	Engineering Society for advancing mobility land sea air and space - Minimum performance standard ofr underwater locating devices - acoustic self-powered	-	-

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equipment and systems –**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MARITIME NAVIGATION AND RADIOCOMMUNICATION
EQUIPMENT AND SYSTEMS –Shipborne voyage data recorder (VDR) –
Performance requirements –
Methods of testing and required test results

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall be not held responsible for identifying any or all such patent rights.

International Standard IEC 61996 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

The text of this standard is based on the following documents:

FDIS	Report on voting
80/248/FDIS	80/273/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annexes A, B and C are for information only.

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this standard may be published at a later date.

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS –

Shipborne voyage data recorder (VDR) – Performance requirements – Methods of testing and required test results

1 Scope

This International Standard specifies the minimum performance requirements, technical characteristics and methods of testing, and required test results, for shipborne voyage data recorder (VDR) installations as required by chapter V of the International Convention for Safety of Life at Sea (SOLAS), as amended. It takes account of IMO resolution A.694 and is associated with IEC 60945. When a requirement in this standard is different from IEC 60945, the requirement in this standard takes precedence.

This standard incorporates the applicable parts of the performance standards included in IMO Resolution A.861.

NOTE All text of this standard, whose wording is identical to that of IMO Resolution A.861, is printed in *italics*, and the Resolution and associated performance standard paragraph numbers are indicated in brackets.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60068-2-27:1987, *Environmental testing – Part 2: Tests – Test Ea and guidance: Shock*

IEC 60268-16:1998, *Sound system equipment – Part 16: Objective rating of speech intelligibility by speech transmission index*

IEC 60651:1979, *Sound level meters*

IEC 60945:1996, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61097-2:1994, *Global maritime distress and safety system (GMDSS) – Part 2: COSPAS-SARSAT EPIRB – Satellite emergency position-indicating radio beacon operating on 406 MHz – Operational and performance requirements, methods of testing and required test results*

IEC 61097-5:1997, *Global maritime distress and safety system (GMDSS) – Part 5: Inmarsat-E – Emergency position-indicating radio beacon (EPIRB) operating through the Inmarsat system – Operational and performance requirements, methods of testing and required test results*

IEC 61097-7:1996, *Global maritime distress and safety system (GMDSS) – Part 7: Shipborne VHF radiotelephone transmitter and receiver – Operational and performance requirements, methods of testing and required test results*

IEC 61162 (all parts), *Maritime navigation and radiocommunication equipment and systems – Digital interfaces*

IEC 61260:1995, *Electroacoustics – Octave-band and fractional-octave-band filters*

- IMO A.658:1989, *Use and fitting of retro-reflective materials on life-saving appliances*
- IMO A.662:1989, *Performance standards for float-free release and activation arrangements for emergency radio equipment*
- IMO A.689:1991, *Testing of life saving appliances*
- IMO A.694:1991, *General requirements for shipborne radio equipment forming part of the Global maritime distress and safety system (GMDSS) and for electronic navigational aids*
- IMO A.810:1995, *Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating on 406 MHz*
- IMO A.812:1995, *Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating through the geostationary INMARSAT satellite system on 1,6 GHz*
- IMO A.830:1995, *Code on alarms and indicators*
- IMO A.861:1997, *Performance standards for shipborne voyage data recorders (VDRs)*
- IMO:1974, *Convention on Safety of Life at Sea (SOLAS), as amended*
- ITU-R M.632-3:1997, *Transmission characteristics of a satellite emergency position-indicating radio beacon (satellite EPIRB) system operating through geostationary satellites in the 1,6 GHz band*
- ITU-R M.633-1:1990, *Transmission characteristics of a satellite emergency position-indicating radiobeacon (satellite EPIRB) system operating through a low polar-orbiting satellite system in the 406 MHz band*
- Eurocae: ED56A – *Minimum operational performance specification (MOPS) for cockpit voice recorder system*
- VESA:1996, *Video electronics standards association – Discrete monitor timings standard 1.0, Revision 0.7 (DMTS)*
- SAE AS8045:1988, *Engineering Society for advancing mobility land sea air and space – Minimum performance standard for underwater locating devices – acoustic-self-powered*

3 Definitions and abbreviations

3.1 Definitions

3.1.1

recorder (VDR) (A.861/4.1)

complete system, including any items required to interface with the sources of input data, for processing and encoding the data, the final recording medium in its capsule, the power supply and dedicated reserve power source

3.1.2

sensor (A.861/4.2)

any unit external to the VDR to which the VDR is connected and from which it obtains data to be recorded

3.1.3

final recording medium (A.861/4.3)

item of hardware on which the data is recorded such that access to it would enable the data to be recovered and played back by use of suitable equipment

3.1.4

playback equipment (A.861/4.4)

equipment, compatible with the recording medium and the format used during recording, employed for recovering the data. It includes also the display or presentation hardware and software that is appropriate to the original data source equipment. Playback equipment is not normally installed on a ship and is not regarded as part of a VDR within this standard

3.1.5

dedicated reserve power source (A.861/4.5)

secondary battery, with suitable automatic charging arrangements, dedicated solely to the VDR, of sufficient capacity to operate it as required by 4.5.3

3.1.6

resolution

smallest detectable increment between two values

3.1.7

data

any item of information received by the VDR for recording, including numerical values, text and audio or radar signals, except where specifically stated or the context dictates otherwise

3.1.8

activation of a suitable alarm

mutable audible alarm and persistent visual indication, given according to the requirements of A.830, but with an audible level in the range of 55 dBA to 65 dBA

3.1.9

bridge work station

position at which a person is expected to be when performing one of the normal bridge duties at, for example, the following work stations:

- centre line conning
- bridge wing(s)
- main radar
- chart table
- helmsman
- communication

3.2 Abbreviations

EPFS	electronic position-fixing system
IMO	International Maritime Organization
INS	integrated navigation system
ITU	International Telecommunication Union
OOW	officer of the watch
ROV	remotely operated vehicle
SENC	system electronic navigation chart
SINAD	signal to noise and distortion
STI	sound transmission index

4 Performance requirements

4.1 General

Performance requirements described in this clause are specified by reference to the numbered paragraphs of IMO Resolution A.861.

4.2 Purpose (A.861/1)

The purpose of a Voyage Data Recorder (VDR) is to maintain a store, in a secure and retrievable form, of information concerning the position, movement, physical status, command and control of a vessel over the period leading up to, and following, an incident having an impact thereon. This information is for use during any subsequent investigation to identify the cause(s) of the incident.

4.3 Operational requirements (A.861/5)

4.3.1 Design and construction (A.861/5.1.4)

The design and construction, which shall be in accordance with the requirements of resolution A.694(17) and international standards acceptable to the International Maritime Organization (IMO), shall take special account of the requirements for data security and continuity of operation as detailed in 4.4 and 4.5.

4.3.2 Maintenance of sequential records (A.861/5.1.1)

The VDR shall continuously maintain sequential records of pre-selected data items relating to the status and output of the ship's equipment, and command and control of the ship, referred to in 4.6.

4.3.3 Co-relation in date and time (A.861/5.1.2, 5.4.1)

To permit subsequent analysis of factors surrounding an incident, the method of recording shall ensure that the various data items can be co-related in date and time during playback on suitable equipment.

The recording method shall be such that the timing of all recorded data items can be derived on playback with a resolution sufficient to reconstruct the history of an incident in detail (see 4.6.1).

4.3.4 Protective capsule (A.861/5.1.3)

4.3.4.1 Final recording medium

The final recording medium shall be installed in a protective capsule. The capsule shall meet all the requirements of 4.3.4.2 and 4.3.4.3.

4.3.4.2 (A.861/5.1.3.1) *The capsule shall be capable of being accessed following an incident but secure against tampering*

The capsule shall enclose the final recording medium. The final recording medium shall not be accessible by standard operating procedures during normal ship operations.

A means shall be provided to retrieve stored information via an external device without opening the protective capsule.