

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Maritime navigation and radiocommunication equipment and systems –
Shipborne voyage data recorder (VDR) –
Part 2: Simplified voyage data recorder (S-VDR) – Performance requirements,
methods of testing and required test results**

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**Matériels et systèmes de navigation et de radiocommunication maritimes –
Enregistreur de données de navigation embarqué (VDR) –
Partie 2: Enregistreur de données de navigation simplifié (S-VDR) – Exigences
de performance, méthodes d'essai et résultats d'essai exigés**



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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms, definitions and abbreviations	10
3.1 Definitions	10
3.2 Abbreviations	11
4 Performance requirements	12
4.1 General.....	12
4.2 Purpose	13
4.3 Operational requirements	13
4.3.1 Design and construction	13
4.3.2 Maintenance of sequential records	13
4.3.3 Co-relation in date and time.....	13
4.3.4 Protective capsule	13
4.3.5 Assessment of recording medium	14
4.3.6 Interfaces	15
4.4 Data selection and security	15
4.4.1 Selection of data items	15
4.4.2 Configuration data	15
4.4.3 Resistance to tampering	16
4.4.4 Recording integrity	16
4.5 Continuity of operation	16
4.5.1 Operation	16
4.5.2 Power source	17
4.5.3 Dedicated reserve power source.....	17
4.5.4 Recording period and duration.....	17
4.6 Data items to be recorded	17
4.6.1 Date and time	17
4.6.2 Ship's position	18
4.6.3 Speed.....	18
4.6.4 Heading.....	18
4.6.5 Bridge audio	18
4.6.6 Communications audio	18
4.6.7 Radar data – post-display selection	18
4.6.8 AIS	19
4.6.9 Other items.....	19
4.6.10 Echo sounder	19
4.6.11 Main alarms.....	19
4.6.12 Rudder order and response	19
4.6.13 Engine order and response.....	19
4.6.14 Hull openings (doors) status	19
4.6.15 Watertight and fire door status.....	20
4.6.16 Accelerations and hull stresses	20
4.6.17 Wind speed and direction	20

5	Technical characteristics	20
5.1	Co-relation in date and time	20
5.2	Particular design requirements for the protective capsule	20
5.2.1	Fixed protective capsule	20
5.3	Location beacon(s) for the protective capsule	21
5.3.1	Device for the location of the fixed capsule	21
5.3.2	Device(s) for the location of the float-free capsule	21
5.4	Survivability of recorded data	22
5.4.1	Long-term retention under normal conditions	22
5.4.2	Survival following an incident	22
5.5	Information to be included in the manufacturer's documentation	23
5.5.1	Installation guidelines	23
5.5.2	Operation and maintenance manual	23
5.5.3	Information for use by an investigation authority	23
5.6	Bridge audio specifications	24
5.6.1	Input interface	24
5.6.2	Reference signal	24
5.6.3	Audio frequency response	24
5.6.4	Quality index	24
5.6.5	Audio noise level – signal to noise and distortion	24
5.7	Communications audio	25
5.7.1	Input interfaces	25
5.7.2	Reference signal	25
5.7.3	Audio frequency response	25
5.7.4	Quality index	25
5.7.5	Audio noise level – signal to noise	25
5.7.6	Audio noise level – signal to noise and distortion (SINAD)	25
5.8	Radar data – post-display selection	25
5.8.1	Input interface	25
5.8.2	Image outputs	26
6	Methods of testing and required test results	26
6.1	General	26
6.1.1	Definitions	26
6.1.2	Playback equipment	27
6.1.3	Sequence of tests	27
6.1.4	Requirements to be checked by inspection only	27
6.1.5	Environmental test conditions for normal operation	28
6.1.6	Recording duration	28
6.1.7	Dedicated reserve power source	29
6.1.8	Recharging of dedicated reserve power source	29
6.1.9	Brief interruption of electrical power	29
6.1.10	System integrity	29
6.1.11	Maintenance of sequential records	30
6.1.12	Co-relation in date and time	30
6.1.13	Design and construction of the protective capsule	30
6.1.14	Selection of data items	33
6.1.15	Power source	33

6.2	Data items to be recorded	33
6.2.1	Date/time, ship's position, speed and heading	33
6.2.2	Bridge audio	34
6.2.3	Communications audio	37
6.2.4	Radar data, post-display selection	40
6.2.5	AIS	48
6.2.6	Other items.....	49
6.2.7	Interfaces	49
Annex A	(normative) IEC 61162 sentence formats	50
Annex B	(informative) Cross-references between VDR and S-VDR	51
Annex C	(normative) Download and playback equipment for investigating authorities	52
C.1	Data output interface	52
C.1.1	Data port	52
C.1.2	Cable length	52
C.1.3	Ethernet interface	52
C.1.4	USB interface	52
C.2	Software for data downloading, playback and conversion	52
C.2.1	General	52
C.3	Downloading software	53
C.3.1	Playback software	53
C.3.2	Conversion software	53
C.4	Downloading of data.....	54
C.4.1	Affect to data and S-VDR operation	54
C.4.2	Multiple downloads	54
C.4.3	Deletion of data	54
C.4.4	Required time	54
C.4.5	Multiple data sets	54
C.5	Instructions	55
C.5.1	Basic and detailed instructions	55
C.6	Packaging and storage	55
Annex D	(informative) Mandatory alarms	56
Annex E	(informative) Requirement/test – cross-references	58
Bibliography	60
Figure 1	– Test set-up block diagram	42
Figure 2	– Comparison of images	46
Table 1	– Bridge audio, signal to noise measurements	36
Table 2	– Bridge audio, signal to noise and distortion (SINAD) measurements.....	37
Table 3	– Communications audio, signal to no-signal measurements	39
Table 4	– Communications audio, signal to noise and distortion (SINAD) measurements	40
Table 5	– Intersection colours of test images 1 and 2.....	44
Table A.1	– References in this standard	50
Table B.1	– Subject list and subclauses	51

Table D.1 – IMO instrument: SOLAS Chapter II-1 ^a	56
Table D.2 – IMO instrument: SOLAS Chapter II-2 ^a	57
Table D.3 – IMO instrument: Resolution A.481	57
Table E.1 – Subject list and subclauses	58

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – SHIPBORNE VOYAGE DATA RECORDER (VDR) –

Part 2: Simplified voyage data recorder (S-VDR) – Performance requirements, methods of testing and required test results

FOREWORD

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International Standard IEC 61996-2 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This bilingual version (2017-01) corresponds to the English version, published in 2007-11.

This second edition cancels and replaces the first edition published in 2006, and constitutes a technical revision. A new requirement has been added to 4.3.6 for an interface to be used for downloading the stored data to an external computer. This is defined in Annex C which replaces the Annex C of the first edition which contained an IMO Circular which recommended such an interface. An optional LAN interface for connection to radar has been added in 5.8. Some corrections to the text have also been made.

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

CDV	Report on voting
80/471/CDV	80/500/RVC

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

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 61996 series, under the general title *Maritime navigation and radiocommunication equipment and systems – Shipborne voyage data recorder (VDR)*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
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INTRODUCTION

The S-VDR has been introduced by IMO for fitting to existing ships as a simplified alternative to the voyage data recorder (VDR) which is required for all new ships.

This part of IEC 61996 provides information on the testing requirements for S-VDR as defined in IMO performance standard MSC.163(78).

The specification for S-VDR differs significantly from that for VDR in two areas:

- a) the requirements for monitoring certain sensors are reduced when the data is not provided in IEC 61162 format, and
- b) the requirements for the protective S-VDR capsule are different from the VDR capsule, both for the fixed and float-free versions.

Annex B provides a cross-reference between this standard and IEC 61996-1 to aid test houses who may already have test results for VDRs which are being submitted as S-VDRs.

Subsequent to publishing the performance standard for S-VDR, MSC.163(78), in 2004, the IMO sub-committee on Safety of Navigation (NAV) discussed the issue of download and playback of information. Recognising that after an accident there is a need for investigators to be able to download the stored data and playback the information from VDRs/S-VDRs without delay, the sub-committee agreed on recommended means for extracting stored data for investigation authorities. This was adopted by MSC 81 in 2005 as an amendment to resolution MSC.163(78) given in resolution MSC.214(81). This edition of the standard incorporates this amendment.

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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – SHIPBORNE VOYAGE DATA RECORDER (VDR) –

Part 2: Simplified voyage data recorder (S-VDR) – Performance requirements, methods of testing and required test results

1 Scope

This part of IEC 61996 specifies the minimum performance requirements, technical characteristics and methods of testing, and required test results, for simplified shipborne voyage data recorders (S-VDRs) as required by IMO MSC.163(78). It takes into account IMO resolution A.694(17) and is associated with IEC 60945. When a requirement in this standard is different from IEC 60945, the requirement in this standard takes precedence.

NOTE All text of this standard, whose wording is identical to that of IMO MSC.163(78) or A.861(20) is printed in *italics*, and the Resolution and associated performance standard paragraph numbers are indicated in brackets.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

IEC 60268-16:2003, *Sound system equipment – Part 16: Objective rating of speech intelligibility by speech transmission index*

IEC 60945:2002, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61097-2, *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 61097-7:1996, *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 61162-1, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners*

IEC 61162-2, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 2: Single talker and multiple listeners, high-speed transmission*

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

IEC 61672-1:2002, *Electroacoustics – Sound level meters – Part 1: Specifications*

IMO A.658(16), *Use and fitting of retro-reflective materials on life-saving appliances*

IMO A.662(16), *Performance standards for float-free release and activation arrangements for emergency radio equipment*

IMO A.694(17), *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(19), *Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating on 406 MHz*

IMO A.830(19), *Code on alarms and indicators*

IMO A.861(20), *Performance standards for shipborne voyage data recorders (VDRs)*

IMO MSC.81(70), *Testing of life saving appliances*

IMO MSC.163(78), *Performance standards for shipborne simplified voyage data recorders (S-VDR)*

IMO MSC.214(81), Annex 2, *Amendments to the recommendation on performance standards for shipborne simplified voyage data recorders (VDRs) (Resolution MSC.163(78))*

IMO:1974, *International Convention for the Safety of Life at Sea (SOLAS), as amended*

ITU-R M.633-3:2004, *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 Amendment 1 – *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 (DMT)*

SAE AS 8045:1988, *Engineering Society for advancing mobility land sea air and space – Minimum performance standard for underwater locating devices – acoustic-self-powered*

3 Terms, definitions and abbreviations

For the purposes of this document, the following terms, definitions and abbreviations apply.

3.1 Definitions

3.1.1

activation of a suitable alarm

mutable audible alarm and persistent visual indication, given according to the requirements of IMO A.830(19) but with an audible level in the range of 55 dBA to 65 dBA

3.1.2

combined EPIRB/S-VDR capsule

a single unit which meets all the requirements of a satellite EPIRB (as required by the carriage requirements of SOLAS IV) and all the requirements of a S-VDR (as required by the carriage requirements of SOLAS V)

3.1.3**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
- helms
- communication

3.1.4**data**

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

3.1.5**dedicated reserve power source** (MSC.163(78) 4.5)

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

3.1.6**final recording medium** (MSC.163(78) 4.3)**(FRM)**

any 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

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3.1.7**playback equipment** (MSC.163(78) 4.4)

any 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

3.1.8**recorder** (MSC.163(78) 4.1)**(S-VDR)**

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

3.1.9**resolution**

smallest detectable increment between two values

3.1.10**sensor** (MSC.163(78) 4.2)

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

3.2 Abbreviations

AIS	Automatic identification system
ALR	IEC 61162 sentence: Set alarm state
DPT	IEC 61162 sentence: Depth relative to the transducer
DTM	IEC 61162 sentence: Geodetic datum reference

EPFS	Electronic position fixing system
EPIRB	Emergency position-indicating radio beacon
EUT	Equipment under test
GMDSS	Global maritime distress and safety system
GNS	IEC 61162 sentence: GNSS fix data
GNSS	Global navigation satellite system
HDG	IEC 61162 sentence: Magnetic compass heading
HDT	IEC 61162 sentence: True heading
HTC	IEC 61162 sentence: Heading/track control command
HTD	IEC 61162 sentence: Heading/track control data
IMO	International Maritime Organization
INS	Integrated navigation system
ITU	International Telecommunication Union
MWV	IEC 61162 sentence: Wind speed and angle
OOW	Officer of the watch
ROV	Remotely operated vehicle
RPM	IEC 61162 sentence: Revolutions per minute
RSA	IEC 61162 sentence: Rudder sense angle
SAR	Search and rescue
SENC	System electronic navigation chart
SINAD	Signal to noise and distortion
STI	Sound transmission index
TXT	IEC 61162 sentence: Text message
UTC	Coordinated universal time
VDM	IEC 61162 sentence: AIS – VHF data link message
VDO	IEC 61162 sentence: AIS – VHF data link own-vessel message
VHF	Very high frequency
VBW	IEC 61162 sentence: Dual ground water speed
XDR	IEC 61162 sentence: Transducer measurements
ZDA	IEC 61162 sentence: Time and date

NOTE For IEC 61162 sentences, see Annex A.

4 Performance requirements

Performance requirements described in the following Clauses are specified, where relevant, by reference to the numbered paragraphs of IMO MSC.163(78), if not otherwise indicated.

4.1 General

Requirements specified in this standard are only relevant to equipment designated as an S-VDR and required to meet IMO MSC.163(78).

For equipment designated as a VDR to IMO Performance standards defined in resolution A.861(20) refer to IEC 61996-1.

A table of cross-references between this standard and IEC 61996-1 is included in Annex B.

4.2 Purpose

(MSC.163(78) 1)

The purpose of a simplified voyage data recorder (S-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. Information contained in a S-VDR shall be made available to both the Administration and the shipowner. This information is for use during any subsequent investigation to identify the cause(s) of the incident.

4.3 Operational requirements

(MSC.163(78) 5)

4.3.1 Design and construction

(MSC.163(78) 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 Organization¹, shall take special account of the requirements for data security and continuity of operation as detailed in IMO MSC.163(78) 5.2 and 5.3 and in this standard 4.3, 4.4 and 4.5.

4.3.2 Maintenance of sequential records

(MSC.163(78) 5.1.1)

The S-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.

<https://standards.iteh.ai/catalog/standards/sist/4332aab7-c499-46ea-af86-bd902891b29f/iec-61996-2-2007>

4.3.3 Co-relation in date and time

(MSC.163(78) 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 other 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

4.3.4.1 Final recording medium

(MSC.163(78) 5.1.3)

The final recording medium shall be installed in a protective capsule. The capsule may be designed to remain fixed to the ship in all circumstances. Alternatively, it may be designed to float free automatically if the ship sinks (see 5.2). The fixed capsule may also comply with the requirements of IEC 61996-1.

4.3.4.1.1 Fixed capsule

(MSC.163(78) 5.1.3.2)

¹ Refer to IEC 60945: *Maritime navigation and radiocommunication equipment and systems – General requirements, methods of testing and required test results.*