

INTERNATIONAL STANDARD

IEC 61174

Second edition
2001-10

Maritime navigation and radiocommunication equipment and systems – Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results

© IEC 2001 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission 3, rue de Varembé Geneva, Switzerland
Telefax: +41 22 919 0300 e-mail: inmail@iec.ch IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE **XD**

For price, see current catalogue

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Definitions and abbreviations.....	9
3.1 Definitions	9
3.2 Abbreviations	11
4 Minimum operational and performance requirements.....	12
4.1 Introduction	12
4.2 ECDIS definitions	12
4.3 Display of SENC information	13
4.4 Provision and updating of chart information.....	14
4.5 Scale.....	15
4.6 Display of other navigational information	15
4.7 Display mode and generation of the neighbouring area	16
4.8 Colours and symbols	16
4.9 Display requirements.....	16
4.10 Route planning, monitoring and voyage recording	16
4.11 Accuracy	19
4.12 Connections with other equipment (Interfaces).....	19
4.13 Performance tests, malfunction alarms and indications.....	19
4.14 Back-up arrangements	19
4.15 Power supply.....	20
5 Requirements contained in IHO special publications.....	20
5.1 Content and structure of chart data	20
5.2 Priority of chart display.....	20
5.3 Display of chart information	21
5.3.1 Scale and navigation purpose.....	21
5.3.2 Text.....	21
5.3.3 Units and legend	22
5.4 Display functions	22
5.4.1 Object information	22
5.4.2 Navigational information	23
5.4.3 Safety contour	23
5.4.4 Navigational calculations	23
5.5 Supplementary display functions	23
5.5.1 Additional mariner's information.....	23
5.5.2 Additional non-HO information	24
5.5.3 Tidal adjustment.....	24
5.6 Use of the presentation library.....	24
5.7 Display characteristics.....	24

5.8	Performance requirements	25
5.8.1	Redraw.....	25
5.8.2	Resolution	25
5.8.3	Number of colours	25
5.8.4	Brightness and contrast.....	26
5.9	Ergonomic requirements.....	26
5.10	Update of chart information	27
5.10.1	General	27
5.10.2	Manual update.....	28
5.10.3	Semi-automatic update.....	28
5.10.4	Reception of updates.....	28
5.10.5	Sequence check	29
5.10.6	Consistency check.....	29
5.10.7	Geographic applicability	29
5.10.8	Summary report.....	29
5.10.9	Review of ENC updates.....	29
5.10.10	Modification of updates.....	29
6	Methods of testing and required test results	29
6.1	EUT installation and technical documentation.....	29
6.2	Interfaces	30
6.3	Environmental	30
6.4	Preparation	30
6.4.1	Power-up.....	30
6.4.2	Initial ship parameters	30
6.4.3	Required test items	31
6.5	Initial data tests.....	31
6.5.1	Presentation library	31
6.5.2	ENC	31
6.6	Accuracy	32
6.7	Visual requirements.....	32
6.7.1	Symbols	32
6.7.2	Units and legend	32
6.7.3	Colour table.....	33
6.7.4	Resolution	35
6.7.5	Display characteristics.....	36
6.8	Functional requirements	36
6.8.1	Standard display.....	36
6.8.2	Display base.....	36
6.8.3	All other information	36
6.8.4	Display priorities.....	36
6.8.5	Additional display functions	37
6.8.6	Scale and navigation purpose.....	37
6.8.7	Mode and orientation.....	38
6.8.8	Safety contour	38
6.8.9	Safety depth	38
6.8.10	Object information	38
6.8.11	Navigation related functions	39

6.8.12	Position integration.....	39
6.8.13	Radar and plotting information.....	40
6.8.14	Loading of corrupted data.....	40
6.8.15	Automatic updates.....	40
6.8.16	Manual updates.....	41
6.8.17	Self-tests of major functions.....	42
6.9	Operational requirements.....	42
6.9.1	Ergonomic principles.....	42
6.9.2	Route planning.....	42
6.9.3	Route monitoring.....	43
6.9.4	Twelve-hour log.....	44
6.9.5	Voyage record.....	44
6.9.6	Power supply.....	44
Annex A (normative)	SENC information to be displayed during route planning and route monitoring.....	45
Annex B (normative)	Navigational elements and parameters.....	46
Annex C (normative)	Areas for which special conditions exist.....	47
Annex D (normative)	Alarms and indicators.....	48
Annex E (normative)	Navigational symbols.....	49
Annex F (normative)	ENC test data set.....	54
Annex G (normative)	Back-up arrangements.....	57
Annex H (normative)	ECDIS in the RCDS mode of operation.....	67
Annex I (normative)	Alarms and indicators in the RCDS mode of operation.....	87
Annex J (normative)	Scenario definitions and plots.....	88
Table 1 –	Light levels.....	34
Table 2 –	Light levels.....	35
Table 3 –	Area, line and point objects.....	39

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARITIME NAVIGATION AND RADIOCOMMUNICATION
EQUIPMENT AND SYSTEMS –**
**Electronic chart display and information system (ECDIS) –
Operational and 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 not be held responsible for identifying any or all such patent rights.

International Standard IEC 61174 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This second edition of IEC 61174 cancels and replaces the first edition published in 1998, of which it constitutes a technical revision.

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

FDIS	Report on voting
80/308/FDIS	80/316/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, C, D, E, F, G, H, I and J form an integral part of this standard.

The committee has decided that the contents of this publication will remain unchanged until June 2004. At this date, the publication will be

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

INTRODUCTION

For this second edition of this International Standard, the maintenance team completed the following tasks:

- a) developed minimum operational and performance requirements for the RCDS mode of operation in accordance with appendix 7 of the IMO performance standards as amended by IMO resolution MSC.86, importing much of the text from appendix 7 to produce an unambiguous and user-friendly annex H to this standard;
- b) developed separate tests for back-up arrangements as defined by appendix 6 of the IMO performance standards (see annex G);
- c) clarified the colour tolerance requirements and created allowances for the separate testing of monitors;
- d) performed an extensive review of the standard to ensure proper referencing and language throughout.

Technical committee 80 recognizes that there is further work to be accomplished in this standard, and a future revision is anticipated within 12 to 18 months, to incorporate some critical hydrographic considerations including the RNC test data set, several S-57 definitions and tests and harmonisation of the navigation related symbols.

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS –

Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results

1 Scope

This International Standard specifies the performance requirements, methods of testing and required test results of equipment conforming to performance standards not inferior to those adopted by the IMO in resolution A.817 as amended by annex 5 to IMO resolution MSC.64 and annex 4 to IMO resolution MSC.86.

This standard is based upon the performance standards of IMO resolution A.817, and is also associated with IMO resolution A.694 and IEC 60945. Reference is made, where appropriate, to IMO resolution A.817, and all subclauses whose wording is identical to that in the resolution are printed in italics.

In association with the above IMO resolution A.817, are the International Hydrographic Organization (IHO) special publications S-52, S-57 and S-61. This standard has included extracts from the above publications where they are applicable to this equipment. Where reference is made, all subclauses whose wording is identical to that in the publications, are printed in italics.

The requirements of this standard are not intended to prevent the use of new techniques in equipment and systems, provided the facilities offered are not inferior to those stated.

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 60872-1: *Maritime navigation and radiocommunication equipment and systems – Radar plotting aids – Part 1: Automatic radar plotting aids (ARPA) – Methods of testing and required test results*

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

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

ISO 9000 (all parts), *Quality management and quality assurance standards*

IMO Convention for safety of life at sea (SOLAS) 1997 (as amended)

IMO A.424:1979, *Performance standards for gyro-compasses*

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.817:1995, *Performance standards for electronic chart display and information systems (ECDIS)*

IMO A.821:1995, *Performance standards for gyro-compasses for high-speed craft*

IMO A.823:1995, *Performance standards for automatic radar plotting aids (ARPAs)*

IMO A.824:1995, *Performance standards for devices to indicate speed and distance*

IMO MSC.64(67):1996, Annex 4 – *Performance standards for radar equipment*

IMO MSC.64(67):1996, Annex 5 – *Amendment to IMO A.817*

IMO MSC.86(70):1998, Annex 4 – *Amendments to IMO A.817*

IHO S-52:1996, *Specifications for chart content and display aspects of ECDIS*

IHO S-52, appendix 1:1996, *Guidance on updating the electronic navigational chart*

IHO S-52, appendix 2:1997 (as amended), *Colour and symbol specifications for ECDIS*

IHO S-52, appendix 3:1997, *Glossary of ECDIS-related terms*

IHO S-52, appendix 4: *Test data set for use with IEC 61174*

IHO S-57:1996 (as amended), *Transfer standard for digital hydrographic data*

IHO S-61:1999, *Product specification for raster navigational charts (RNC)*