INTERNATIONAL STANDARD

IEC 60936-1

Edition 1.1

2002-08

Edition 1:1999 consolidated with amendment 1:2002

Maritime navigation and radiocommunication equipment and systems – Radar –

Part 1: Shipborne radar – Performance requirements – Methods of testing and required test results

Matériels et systèmes de navigation et de radiocommunication maritimes – Radars –

Partie 1: Radars de navire – Exigences de fonctionnement – Méthodes d'essai et résultats d'essai exigés



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – RADAR –

Part 1: Shipborne radar – 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.
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International Standard IEC 60936-1 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

The IEC 60936 series, of which this is part 1, replaces IEC 60936 published in 1988, in order to reflect the new requirements of the International Maritime Organization (IMO). This part of the series contains some of the IMO specific requirements.

This consolidated version of IEC 60936-1 consists of the first edition (1999) [documents 80/235/FDIS and 80/249/RVD] and its amendment 1 (2002) [documents 80/341/FDIS and 80/346/RVD].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 1.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

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

Annexes A, B, C and D form an integral part of this standard.

Annex E is for information only.

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

The committee has decided that the contents of the base publication and its amendments will remain unchanged until 2003. At this date, the publication will be

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- withdrawn;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

NOTE Annex C.5.2.2 of this standard contains symbols for the display of AIS-targets. Due to the fact that AIS is a new navigation system, the process of the evaluation of different proposals for the presentation of AIS information on the bridge is still ongoing. A final decision about AIS presentation can only be drawn after functional and operational evaluation of related research projects. In this respect the symbols for AIS targets given in Annex C.5.2.2 No. 2.3, 2.4, 2.5 are provisional and subject of future decision.

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – RADAR –

Part 1: Shipborne radar – Performance requirements – Methods of testing and required test results

1 Scope

This International Standard specifies the minimum performance requirements, methods of testing and required test results for conformance to performance standards not inferior to those required by IMO resolution MSC.64 (67), Annex 4. In addition, it takes account of IMO resolution A.694 and is associated with IEC 60945. When a requirement of this standard is different from that of IEC 60945, the requirement in this standard shall take precedence.

This standard does not include the optional performance requirements for superimposition of selected parts of SENC information. These are specified in IEC 60936-3.

All text in this standard whose wording is identical to that in IMO resolution MSC.64 (67), Annex 4 is printed in *italics*, and the resolution (abbreviated to – A4) and paragraph numbers are indicated in brackets, for example (A4/3.3).

2 Normative references

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this part of IEC 60936. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60936 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 documents referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

IEC 60872-1:1998, *Maritime navigation and radiocommunication equipment and systems – Radar plotting – Part 1: Automatic radar plotting aids (ARPA) – Methods of testing and required test results*

IEC 60872-2:1999, *Maritime navigation and radiocommunication equipment and systems – Radar plotting – Part 2: Automatic tracking aids (ATA) – Methods of testing and required test results*

IEC 60872-3:2000, *Maritime navigation and radiocommunication equipment and systems – Radar plotting aids – Part 3: Electronic plotting aid (EPA) –Performance requirements – Methods of testing and required test results*

IEC 60936-3:2002, *Maritime navigation and radiocommunication equipment and systems – Radar – Part 3: Radar with chart facilities – Performance requirements – Methods of testing and required test results*

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

IEC 61023:1999, *Maritime navigation and radiocommunication equipment and systems – Marine speed and distance measuring equipment (SDME). Performance requirements – Methods of testing and required test results*

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

IEC 61174:1998, *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 61209:1999, *Maritime navigation and radiocommunication equipment and systems – Integrated bridge systems (IBS) – Operational and performance requirements, methods of testing and required test results*

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

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

IMO A.477:1981, *Performance standards for radar equipment*

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.823:1995, *Performance standards for automatic radar plotting aids*

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

IMO A.861:1997, *Performance standards for shipborne voyage data recorders (VDRs)*

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

IMO MSC SN/Circular 197:1997, *Operation of marine radar for SART detection*

IMO:1997, *International Convention for the Safety of Life at Sea (SOLAS) Consolidated edition*

ITU:1997, *Radio Regulations*

ITU-R M.628-3:1994, *Technical characteristics for search and rescue radar transponders*

ITU-R M.824-2:1995, *Technical parameters of radar beacons (RACONS)*

ITU-R M.1177-1:1997, *Techniques for measurement of spurious emissions of radar systems*

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

3 Performance requirements

The radio frequency of operation of the equipment shall at all times be within the limits defined in the ITU Radio Regulations.

At the World Radio Conference in 1997, the ITU modified Appendix S3 of the Radio Regulations to include maximum permitted spurious emission power levels for radiodetermination services. This Appendix S3 references ITU-R M.1177, a recommendation on measurement methods for spurious emissions of radar systems, as guidance for the measurement of the required levels.