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Electrical installations in ships -
Part 504: Automation, control and instrumentation

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60092-504:2016. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60092-504 has been prepared by IEC technical committee 18: Electrical installations of ships and of mobile and fixed offshore units. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) aligned bridge and machinery alert references throughout the document;
b) transfer of EMC items to IEC 60533 throughout the document;
c) update of power management and energy management (9.5 and 9.6).

The text of this International Standard is based on the following documents:

Draft	Report on voting
18/2024/FDIS	18/2034/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60092 series, published under the general title *Electrical installations in ships*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

IEC 60092 forms a series of International Standards for electrical installations in sea-going ships, incorporating good practice and coordinating, as far as possible, existing rules.

These standards form a code of practical interpretation and amplification of the requirements of the International Convention for the Safety of Life at Sea (SOLAS), a guide for future regulations which ~~may~~ can be prepared and a statement of practice for use by ship owners, shipbuilders and appropriate organizations.

1 Scope

This part of IEC 60092 specifies requirements for electrical, electronic and programmable equipment supporting essential services intended for automation, control, monitoring, alert, ~~and~~ safety and protection systems ~~for in ships~~

This document is not applicable for:

– maritime navigation and radiocommunication equipment and systems making use of electrotechnical, electronic, electroacoustic, electro-optical and data processing techniques.

NOTE It is important that equipment in the scope of IEC TC 80 (Maritime navigation and radiocommunication equipment and systems) complies with IEC 60945 which already covers the requirements stated in this document.

– internal communication systems, except PA/GA (Public Adress/General Alarm).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60050 (all parts), *International Electrotechnical Vocabulary (IEV)* (available at www.electropedia.org)~~

IEC 60068-2-1, *Environmental testing - Part 2: Tests - Test A: Cold*

IEC 60068-2-2, *Environmental testing - Part 2: Tests - Test B: Dry heat*

IEC 60068-2-6, *Environmental testing - Part 2: Tests - Test Fc: Vibration (sinusoidal)*

IEC 60068-2-30, *Environmental testing - Part 2: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-52, *Environmental testing - Part 2: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)*

IEC 60079-14:2024, *Explosive atmospheres - Part 14: Electrical installation design, selection and installation of equipment, including initial inspection*

IEC 60092-101:~~1994~~2018, *Electrical installations in ships - Part 101: Definitions and general requirements*
~~IEC 60092-101:1994/AMD1:1995~~

IEC 60092-201:1994, *Electrical installations in ships - Part 201: System design - General*

IEC 60092-202, *Electrical installations in ships - Part 202: System design - Protection*

~~IEC 60092-302, *Electrical installations in ships – Part 302: Low -voltage switchgear and controlgear assemblies*~~

IEC 60092-302-2, *Electrical installations in ships - Part 302-2: Low voltage switchgear and controlgear assemblies - Marine power*

IEC 60092-353, *Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV*

IEC 60092-376, *Electrical installations in ships - Part 376: Cables for control and instrumentation circuits 150/250 V (300 V)*

IEC 60092-501, *Electrical installations in ships - Part 501: Special features - Electric propulsion plant*

~~IEC 60092-502, *Electrical installations in ships – Part 502: Tankers – Special features*~~

IEC 60331 (all parts), *Tests for electric cables under fire conditions*

IEC 60332-1-2, *Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame*

IEC 60447, *Basic and safety principles for man-machine interface, marking and identification - Actuating principles*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60533, *Electrical and electronic installations in ships - Electromagnetic compatibility (EMC) - Ships with a metallic hull*

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

~~IEC 61000-4-2, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measuring techniques – Electrostatic discharge immunity test*~~

~~IEC 61000-4-3, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*~~

~~IEC 61000-4-4, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*~~

~~IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*~~

~~IEC 61000-4-6, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*~~

IEC 61000-4-11, *Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase*

IEC 61000-4-17, *Electromagnetic compatibility (EMC) - Part 4-17: Testing and measurement techniques - Ripple on d.c. input power port immunity test*

IEC 61000-4-29, *Electromagnetic compatibility (EMC) - Part 4-29: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests*

~~IEC 61355-1, *Classification and designation of documents for plants, systems and equipment – Part 1: rules and classification tables*~~

Bibliography

~~IEC 60050 (all parts), *International electrotechnical vocabulary* (available at <http://www.electropedia.org>)~~

~~IEC 60092-376, *Electrical installations in ships – Part 376: Cables for control and instrumentation circuits 150/250 V (300 V)*~~

~~IEC 60092-401, *Electrical installations in ships – Part 401: Installation and test of completed installation*~~

IEC 60092 (all parts), *Electrical installations in ships*

~~IEC 60092-352, *Electrical installations in ships – Part 352: Choice and installation of electrical cables*~~

IEC 60092-401, *Electrical installations in ships - Part 401: Installation and test of completed installation*

IEC 60092-502, *Electrical installations in ships - Part 502: Tankers - Special features*

~~IEC 60695-2-11, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*~~

~~IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*~~

IEC 61508-4, *Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 4: Definitions and abbreviations*

~~IEC 61924-2:2013, *Maritime navigation and radiocommunication equipment and systems – Integrated navigation systems – Part 2: Modular structure for INS – Operational and performance requirements, methods of testing and required test results*~~

~~IACS Req. 1991/Rev.6 Oct 2014, *Unified requirements E10, Test Specification for Type Approval*~~

~~IMO Resolution MSC.145(77):2003, *performance standards for water level detectors on bulk carriers*~~

IEC 61772, *Nuclear power plants - Control rooms - Application of visual display units (VDUs)*

IEC 62443 (all parts), *Industrial communication networks - Network and system security*

IEC 63154, *Maritime navigation and radiocommunication equipment and systems - Cybersecurity - General requirements, methods of testing and required test results*

ISO/IEC 12207, *Systems and software engineering*

ISO 3741, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for reverberation test rooms*

ISO 3743, *Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering methods for small, movable sources in reverberant fields, Part 2: Methods for special reverberation test rooms*

ISO 3744, *Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane*

ISO 3745, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for anechoic rooms and hemi-anechoic rooms*

ISO 3746, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane*

ISO 3747, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering/survey methods for use in situ in a reverberant environment*

ABS publication*, Guidance notes on the application of ergonomics to marine systems (2014-02)*

COLREG Annex III, *Technical details of sound signal appliances*

EN 50695, *Public-address-general-emergency-alarm-system, communication-system for marine applications*

IMO Circular MSC.1/Circ. 808, *Recommendation on performance standards for public address systems on passenger ships, including cabling*

IMO Circular MSC.1/Circ.1369, *Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty*

IMO Circular MSC.1/Circ. 1369/Add.1, *Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty*, revisions to interpretations nos. 22 and 27 of Appendix 1 of MSC.1/CIRC.1369

IMO Circular MSC.1/Circ. 1530, *Unified interpretations of SOLAS regulations iii/6.4 and iii/6.5 and clause 7.2 of the ISA code*

IMO Resolution A.1204(34), *Code on Alerts and Indicators, 2025*

IMO Resolution MSC.188(79), *Water Level Detection and Alarm Systems for Multiple-Hold Cargo Ships*

LSA Code - International Life-Saving Appliance Code - Resolution MSC.48(66)

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