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Ships and marine technology — Guidelines for the installation of ship communication networks for shipboard equipment and systems

Navires et technologie maritime — Lignes directrices pour l'installation de réseaux de communication des navires pour les équipements et systèmes embarqués

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16425 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 6, *Navigation and ship operations*.

Introduction

This International Standard gives guidelines relating to such matters as the communication network-system architecture, data requirements, administration, operation, commissioning, inspection and testing.

This International Standard also takes into account differences between shipboard communication networks and networks that are used outside of ships, and stipulates requirements and the like in clauses relating to matters unique to shipboard use.

Until now, there have not been comprehensive guidelines for connecting devices provided by many different manufacturers to a network via generic means, and this has impeded the wider use of shipboard networks.

This International Standard will make it possible to provide guidelines for all aspects of communication network-system design, commissioning, inspection, testing and operation, and improve convenience to all involved parties, including manufacturers, engineering firms, shipbuilders, and shipping companies.

This communication network for shipboard equipment connects equipment, and shares information gathered from shipboard equipment and systems via a network. This communication network is connected to the navigational equipment network and engine-control network via an appropriate gateway.

The independence of such a network is ensured by using a gateway.

This network is intended for information sharing and is not directly related to safety of navigation. Also, it is not a system targeted for classification rules.

Additionally, Annex A is attached to provide detailed examples of technical information that serve as guidelines for some difficulties caused when the information network system is designed.

NOTE Requirements for wireless communication systems, which serve as an effective method of onboard wireless communication, is specified in IEEE 802.11, and national laws are established based on the aforementioned IEEE in each country. Different frequency and output range are allotted by each country, and regulations exist for such frequencies and ranges in some countries. Given the circumstances, it is possible that wireless communication systems cannot be used when calling at a port. Therefore, wireless communication systems are outside the scope of this International Standard.

Ships and marine technology — Guidelines for the installation of ship communication networks for shipboard equipment and systems

1 Scope

This International Standard specifies installation guidelines for ship communication networks for improving communication for shipboard equipment and systems that are independent from navigational equipment networks and engine-control networks.

This International Standard utilizes existing standards relating to protocols, and provides new guidelines for such aspects as communication network-system architecture, administration, operation, and installation.

The new guidelines specifically include: redundancy if necessary for a shipboard communication network system; network administration that does not require experts; physical as well as logical security; and network installation.

2 Normative references

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

IEC 61162-450, *Maritime navigation and radio communication equipment and systems — Digital interfaces — Part 450: Multiple talkers and multiple listeners — Ethernet interconnection*

IEEE 802.3, *Ethernet (Formerly: Carrier Sense Multiple Access with Collision Detection)*

3 Terms and definitions

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

3.1
network
communication network restricted in scope to a ship

3.2
XML
eXtensible Markup Language
meta language for sending and receiving data via a network that is recommended by the WWW Consortium

3.3
gateway
communication device that connects computer networks to networks with differing protocols

3.4
collision domain
domain in a computer network where simultaneous transmission will cause collisions or congestion

3.5
broadcast domain
domain on a computer network where broadcasted frames (broadcasts) are received