
**Ships and marine technology — Ship's
bridge layout and associated
equipment — Requirements and
guidelines for centralized and integrated
bridge functions**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

*Navires et technologie maritime — Aménagement de la passerelle d'un
navire et disposition de ses équipements annexes — Exigences
supplémentaires et directives pour les fonctions centralisées et
intégrées de la passerelle*

ISO 14612:2004

[https://standards.iteh.ai/catalog/standards/sist/06a9a513-b4a0-4cec-aa68-
cb4b59088c79/iso-14612-2004](https://standards.iteh.ai/catalog/standards/sist/06a9a513-b4a0-4cec-aa68-cb4b59088c79/iso-14612-2004)



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 14612:2004

<https://standards.iteh.ai/catalog/standards/sist/06a9a513-b4a0-4cec-aa68-cb4b59088c79/iso-14612-2004>

© ISO 2004

All rights reserved. Unless otherwise specified, 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 either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope.....	1
2 Normative references	1
3 Terms, definitions and abbreviated terms.....	1
4 Bridge configuration.....	7
5 Bridge arrangement.....	10
6 Bridge equipment.....	17
7 Bridge working environment	19
6 Failure mode and effects analysis (FMEA).....	19
7 Bridge operating manuals.....	19
Annex A (normative) Ship's bridge for high-speed craft	20
Annex B (informative) Typical bridge layouts with centralized and integrated functions	22
Bibliography	24

ISO 14612:2004

<https://standards.itech.ai/catalog/standards/sist/06a9a513-b4a0-4cec-aa68-cb4b59088c79/iso-14612-2004>

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 14612 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 5, *Ships' bridge layout*.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO 14612:2004](https://standards.iteh.ai/catalog/standards/sist/06a9a513-b4a0-4cec-aa68-cb4b59088c79/iso-14612-2004)

<https://standards.iteh.ai/catalog/standards/sist/06a9a513-b4a0-4cec-aa68-cb4b59088c79/iso-14612-2004>

Introduction

It has become common for maritime officers and crew to move between shipping companies and flag states, to serve on a wide range of ships. Pilots, too, increasingly guide a wide variety of ships and equipment. This International Standard therefore gives requirements and guidelines aimed at ensuring safe navigation by standardizing the bridge system and environment so that watchkeepers are provided with a consistent pattern of equipment layout regardless of the ship type or navigational system fitted on the bridge of a particular vessel.

This International Standard has the same structure as that of ISO 8468. Its requirements concentrate on centralizing and integrating key bridge functions, taking into account human factors, ergonomics and advances in technology, and are additional to the requirements specified in ISO 8468.

Functional requirements are outlined in general terms in order to prescribe the basic functionality, providing the OOW — at each defined workstation — with the best possible overview of internally presented data, easy and ergonomic operation of instruments, necessary performance and reliability in instruments and power supplies, and adequate environmental conditions on the bridge.

All information to the OOW made available from instruments, alarm systems and communication equipment has to be suited for the purpose, and presented in accordance with ergonomic principles. Too much information is stressing and may cause confusion. Too little information may reduce safety.

Information as well as control systems have to provide the needed and correct performance suited to the particular workstation and procedures. Safety aspects related to crew, cargo, ship and the environment need to be addressed in detail.

Guidelines and figures give examples, ideal and/or alternative solutions, when such are well defined. Guiding references and comments are added where applicable.

Annex B includes principle solutions of bridge layouts. It should be noted that no specific layout presents the sole solution for proper bridge fulfilling the requirements laid down in this International Standard. This International Standard is parametric, and different types of ships and operations have different optimum designs, even though basic safety requirements are equal.

This International Standard is related to the IMO Resolution on ergonomic criteria for bridge equipment and the general requirements in SOLAS, Chapter V. Based on SOLAS, Chapter IX (ISM-Code), dealing with casualties attributed to the human element, this International Standard — when conformed with — should reduce such casualties.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 14612:2004

<https://standards.iteh.ai/catalog/standards/sist/06a9a513-b4a0-4cec-aa68-cb4b59088c79/iso-14612-2004>

Ships and marine technology — Ship's bridge layout and associated equipment — Requirements and guidelines for centralized and integrated bridge functions

1 Scope

This International Standard specifies technical requirements for the enhanced functionality of ship's bridge layout and design, with the key navigational functions centralized and integrated, for the purpose of securing safe and efficient operation of the ship, berth-to-berth, regardless of the watchkeeping arrangement in place at a particular time. The requirements are generally additional to those given in ISO 8468.

Where there are physical limitations in applying this International Standard, i.e. to small ships or ships of unusual design, the general principles still apply and can be implemented as far as practicable. It is applicable to seagoing ships where bridge duty is regularly maintained.

NOTE While complying with its requirements, users of this International Standard need also to ensure compliance with such statutory requirements, rules and regulations as may be applicable to the individual ship concerned.

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.

ISO 8468:1990, *Ship's bridge layout and associated equipment — Requirements and guidelines*

HSC Code 2000, *International Code of Safety for High-Speed Craft*

International Convention for the Safety of Life at Sea (SOLAS)

3 Terms, definitions and abbreviated terms

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

3.1

abnormal [operating] condition

condition created when internal technical system failures require operation of back-up systems on the bridge or occur under an irregular operating condition, or when the OOW becomes unfit to perform his duties and has not yet been replaced by another qualified officer

3.2

additional bridge function

function performed on the bridge, but not related to a primary bridge function

EXAMPLE Extended communication function, monitoring and control of ballasting and cargo operations, monitoring and control of machinery, monitoring and control of domestic systems, ship management.

3.3

AIS

automatic ship identification system

3.4

alarm

audio-visual and/or audible signal, indicating an abnormal condition

3.5

alarm transfer system

alarm that is transferred from the bridge to the master and the back-up navigator or any place(s) where assigned by the system in case of any OOW deficiency

3.6

ARPA

automatic radar plotting aid

3.7

back-up navigator

qualified officer who has been designated by the ship's master to be on call if assistance is needed on the navigation bridge

3.8

bridge

area from which the navigation and control of the ship is exercised, including the wheelhouse and bridge wings

[ISO 8468:1990, definition 3.1]

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3.9

bridge arrangement

location and interrelation of workstations, instruments and equipment on the bridge

ISO 14612:2004

<https://standards.iteh.ai/catalog/standards/sist/06a9a513-b4a0-4ccc-aa68-cb4b59088c79/iso-14612-2004>

3.10

bridge configuration

shape of the bridge comprising the outer bulkheads and windows of the bridge area

3.11

bridge alarm system

integrated alarm systems comprising watch monitoring, alarm transfer and centralized alarms

3.12

bridge system

total system for the performance of bridge functions, comprising bridge personnel, technical systems, man-machine interface and procedures

3.13

bridge wing

part of the bridge, on both sides of the ship's wheelhouse, which, in general, extends to the ship's side

[ISO 8468:1990, definition 3.2]

3.14

catwalk

extension to a deck outside the wheelhouse wide enough to allow the safe passage of a person

NOTE Adapted from ISO 8468:1990, 3.3.

3.15**collision avoidance function**

detection and plotting of ships and other moving and stationary objects; determination and execution of course and speed deviations to avoid collision

3.16**commanding view**

view without obstructions which would interfere with the navigator's ability to perform his immediate task

[ISO 8468:1990, definition 3.5]

3.17**communications workstation**

workstation for operation and control of equipment for distress, safety and routine communications

NOTE Adapted from ISO 8468:1990, 3.6.

3.18**conning position**

conning station

place in the wheelhouse with a commanding view and which is used by navigators when monitoring and directing the ship's movements

3.19**display**

means by which a device presents visual information to the navigator, including conventional instrumentation

[ISO 8468:1990, definition 3.8]

3.20**docking**

manoeuvring of the ship alongside a berth, another ship or other structure and controlling the mooring operations

3.21**docking workstation**

workstation from which the ship can be manoeuvred during docking, lock passage and other manoeuvres requiring a view of the ship's side

3.22**electronic navigational chart****ENC**

database, standardized as to content, structure and format for use with ECDIS on the authority of government authorized hydrographic offices

NOTE The ENC contains all the chart information for safe navigation and may contain supplementary information in addition to that contained in the paper chart (e.g. sailing directions), considered necessary for safe navigation.

3.23**electronic chart display and information system****ECDIS**

navigation information system which, with adequate back-up arrangements, can be accepted as complying with the up-to-date chart required by regulation V/19 of the 2000-12-05 Amendments to SOLAS by displaying selected information from a system electronic navigational chart (SENC) with positional information from navigation sensors to assist the mariner in voyage planning and route monitoring, and, if required, additional navigation-related information

3.24
ergonomics

study and design of working environments and their components, work practices, and work procedures for the benefit of the worker's productivity, health, comfort and safety

3.25
field of vision

angular size of a scene that can be observed from a position on the ship's bridge

[ISO 8468:1990, definition 3.10]

3.26
FMEA

failure mode and effects analysis

3.27
GMDSS

global maritime distress and safety system

3.28
helmsman

person who steers the ship underway

[ISO 8468:1990, definition 3.11]

3.29
IMO
International Maritime Organisation

iTeh STANDARD PREVIEW
(standards.iteh.ai)

NOTE A specialized agency of the United Nations devoted exclusively to maritime matters.

3.30
irregular [operating] condition

condition causing an excessive operator workload

<https://standards.iteh.ai/catalog/standards/sist/06a9a513-b4a0-4cec-aa68-cb4b59088c79/iso-14612-2004>

3.31
lookout

activity carried out by sight and hearing as well as by available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision

3.32
manoeuvring

operation of steering systems and propulsion machinery as required to move the ship in predetermined directions or into predetermined positions or tracks

3.33
manual steering workstation

workstation from which the ship can be steered by a helmsman

3.34
master

ship's captain and the person in overall charge of the ship

3.35
monitoring

act of periodically checking equipment and environment in order to detect any changes

NOTE Adapted from ISO 8468:1990, 3.12.

3.36**navigation**

process of position-finding as well as planning, recording and controlling the movement of a ship from one place to another

3.37**voyage-planning workstation**

workstation at which the ship's voyage is planned

3.38**navigator**

qualified officer navigating, operating bridge equipment and manoeuvring the ship

NOTE Adapted from ISO 8468:1990, 3.14.

3.39**normal [operating] condition**

condition whereby all shipboard systems and equipment related to primary bridge functions operate within design limits and external conditions, i.e. weather and traffic, or the malfunction of position-fixing systems do not cause excessive operator workloads

3.40**officer of the watch****OOW**

qualified officer responsible for safe navigation, operating of bridge equipment and manoeuvring of the ship

3.41**primary bridge function**

function related to the determination, execution and maintenance of safe course, speed or position of the ship in relation to the waters, traffic or weather conditions

EXAMPLE Voyage planning function, navigation function, collision avoidance function, manoeuvring function, docking function, monitoring of internal safety systems, external and internal communication related to safety in bridge operation and distress situations.

3.42**primary navigation, traffic surveillance and manoeuvring workstation**

workstation with commanding view used by navigators when carrying out navigation, traffic surveillance and manoeuvring functions

3.43**radar plotting**

whole process of target detection, tracking, calculation of parameters and display of information

3.44**raster chart display system****RCDS**

navigation information system displaying RNCs with positional information from navigation sensors to assist the mariner in route planning and route monitoring and, if required, display additional navigational-related information

3.45**raster navigational chart****RNC**

facsimile of a paper chart originated by, or distributed on the authority of, a government-authorized hydrographic office

NOTE For the purposes of this International Standard, RNC is used to mean a single chart or collection of charts.

3.46

route monitoring

periodic surveillance of the ship's position, course and speed in relation to a pre-planned route and the surrounding waters

3.47

safety workstation

workstation at which monitoring displays and operating elements serving safety are concentrated

3.48

screen

device used for presenting visual information based on one or several displays

3.49

seagoing ship

ship designed, equipped and certified to go to sea

NOTE Adapted from ISO 8468:1990, 3.16.

3.50

secondary navigation workstation

back-up workstation for navigation, which may also be used by an assisting navigator when required

3.51

ship management

administrative and miscellaneous activity

3.52

SOLAS

Safety Of Life At Sea

NOTE The international conventions dealing with maritime safety.
<https://standards.iteh.ai/catalog/standards/sist/06a9a513-b4a0-4ccc-aa68-cb4b59088c79/iso-14612-2004>

3.53

superstructure

decked structure, not including funnels, which is on or above the freeboard deck

[ISO 8468:1990, definition 3.17]

3.54

system electronic navigational chart

SENC

database resulting from the transformation of the ENC by the ECDIS for appropriate use, updates to the ENC by appropriate means and other data added by the mariner

NOTE It is the database that is actually assessed by the ECDIS for the display generation and other navigational functions, and is the equivalent to an up-to-date paper chart. The SENC may also contain information from other sources.

3.55

system raster navigational chart

SRNC

database resulting from the transformation of the RNC by the RCDS to include updates to the RNC by appropriate means

3.56

tracking

process of observing the sequential changes in the position of a target, to establish its motion