

# **Ships and marine technology — Guidelines for implementation of a fleet management system network**

ICS 47.020.99; 35.240.60

# National foreword

This British Standard reproduces verbatim ISO 15849:2001, including amendment 1:2003, and implements it as the UK national standard.

The UK participation in its preparation was entrusted by Technical Committee SME/32, Ships and marine technology, to Subcommittee SME/32/10, Computer applications, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

## Cross-references

The British Standards which implement international publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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This British Standard, having been prepared under the direction of the Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 29 November 2001

## Summary of pages

This document comprises a front cover, an inside front cover, the ISO title page, pages ii to vi, pages 1 to 27 and a back cover.

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## Amendments issued since publication

| Amd. No. | Date          | Comments            |
|----------|---------------|---------------------|
| 16266    | 28 April 2006 | Addition of Annex A |
|          |               |                     |
|          |               |                     |
|          |               |                     |
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ISBN 0 580 38726 7

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**Ships and marine technology — Guidelines  
for implementation of a fleet management  
system network**

*Navires et technologie maritime — Lignes directrices pour la mise en  
oeuvre d'un système de management d'une flotte par réseau*



Reference number  
ISO 15849:2001 + A1:2003(E)



## Contents

|                                                           | Page |
|-----------------------------------------------------------|------|
| 1 Scope .....                                             | 1    |
| 2 Terms and definitions .....                             | 1    |
| 3 Abbreviated terms .....                                 | 3    |
| 4 FMS network architecture .....                          | 3    |
| 4.1 General architecture .....                            | 3    |
| 4.2 Network design .....                                  | 4    |
| 4.3 Network management .....                              | 4    |
| 4.4 Network security .....                                | 5    |
| 4.5 Encryption .....                                      | 5    |
| 4.6 Database model .....                                  | 5    |
| 4.7 Database management system (DBMS) .....               | 5    |
| 5 Shipboard information technology platform (SITP) .....  | 6    |
| 5.1 Introduction .....                                    | 6    |
| 5.2 The SITP data acquisition service .....               | 6    |
| 5.3 SITP executive services .....                         | 7    |
| 5.4 Communications services .....                         | 10   |
| 5.5 SITP underlying system service .....                  | 11   |
| 6 Land-based information technology platform (LITP) ..... | 12   |
| 6.1 General .....                                         | 12   |
| 6.2 Data acquisition services .....                       | 12   |
| 6.3 Executive services .....                              | 12   |
| 6.4 Communications manager .....                          | 12   |
| 6.5 Configuration manager .....                           | 12   |
| 7 Application program interfaces (APIs) .....             | 12   |
| 7.1 Introduction .....                                    | 12   |
| 7.2 Overview of APIs .....                                | 12   |
| 7.3 API applications .....                                | 13   |
| 7.4 API levels of implementation .....                    | 13   |
| 8 System hardware .....                                   | 14   |
| 8.1 System hardware .....                                 | 14   |
| 8.2 Communications bus .....                              | 14   |
| 9 Fault tolerance .....                                   | 14   |
| 9.1 Fault tolerance .....                                 | 14   |
| 9.2 Robustness .....                                      | 14   |
| 10 Demonstration and validation .....                     | 15   |
| 10.1 General .....                                        | 15   |
| 10.2 Test philosophy .....                                | 15   |
| 10.3 System hardware test .....                           | 15   |
| 10.4 LAN software assessment .....                        | 15   |

10.5 Tests and trials ..... 15

11 Quality plan ..... 16

11.1 General ..... 16

11.2 Design and testing of the computer services ..... 16

12 Operation and maintenance ..... 17

13 Human interface ..... 17

13.1 General ..... 17

13.2 Visual display unit (VDU) ..... 17

13.3 Screen image paging ..... 17

14 Training and documentation ..... 17

14.1 General ..... 17

14.2 Documentation ..... 18

Bibliography..... 19

Annex A ..... 20

## 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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15849 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 10, *Computer applications*.

## Foreword to amendment A1

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.

Amendment 1 to ISO 15849:2001 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 10, *Computer applications*.

## Introduction

Competent information management is essential for safe and productive operation of ships and for regulatory compliance. A short list of some of the functions affected includes decision aids for communications, cargo operations, maintenance and repair, personnel records and environmental protection.

The shipbuilding and shipping industries have identified a need to develop comprehensive standards and guides for implementing computer-based shipboard data-management systems.

It is the intent of this International Standard to provide guidelines for the design and implementation of an open client/server architecture for computer and communication networks for shipboard and shore-based applications, as well as guidelines to application software providers to allow ready integration of software applications.

Furthermore, it is the intent of this International Standard to provide guidelines that will promote and enable remote support of the shipboard data systems/networks from support offices ashore.

This International Standard is also intended to assist vessel owners, designers, shipyards, equipment suppliers and computer service providers in the development of contract technical specifications which detail the services to be supported, performance required and criteria for acceptance for specific installations.

## Introduction to amendment A1

Annex A indicates an example of the specifications for the design of the software of the Application Program Interface (API) when it is applied to the SITP and the LTP, as required by the main text of ISO 15849 (Guidelines for the Fleet Management System Network, FMSN) to secure the effective execution of the mutual connectivity with transparency.

# Ships and marine technology — Guidelines for implementation of a fleet management system network

## 1 Scope

This International Standard provides an overview and guide for the selection and implementation by shipowners and operators of a fleet management system (FMS) network of computer services. This includes

- a) guidelines for the general infrastructure, including wide area network, data transmission services and common database facilities,
- b) guidelines for the shipboard installations, including services to application programs, and
- c) guidelines for land-based installations, including services to application programs.

This International Standard does not purport to address the requirements for safety-related systems, e.g. navigation, radio communication as well as systems used to control the operation of the ship.

This International Standard does not purport to address any of the environmental considerations associated with the use of the fleet management system.

## 2 Terms and definitions

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

### 2.1

#### **application program**

computer program that performs a task related to the process being controlled rather than to the functioning of the computer itself

### 2.2

#### **application program interface**

##### **API**

software tool kit that can be used as a building block that facilitates connections primarily between applications and other constituent network software, but that can also provide linkages for other elements of the network

### 2.3

#### **black box test**

test that is based on the design application and does not require a knowledge of the internal program structure

### 2.4

#### **certification**

process of formal approval, by an authority empowered to do so, of arrangements or systems for the reception, storage or transmission of data and intelligence relative to the management, operation or control of vessels

### 2.5

#### **client/server database engine**

commercial database management system serving as a repository for all critical ship operating and configuration information

**2.6**

**client/server architecture**

architecture of computers called servers that manage shared resources and provide access to those shared resources as a service to their clients

**2.7**

**computer system**

functional unit, consisting of one or more computers and associated software, that uses common storage for all or part of a program and also for all or part of the data necessary for the execution of the program

**2.8**

**fault tolerance**

built-in capacity of a system to provide continued correct execution in the presence of a limited number of hardware or software faults

**2.9**

**independent**

independent, as applied to two systems, means that either system will operate with the failure of any part of the other system

**2.10**

**interface**

interface attribute describes the methods and rules governing interaction between different entities

**2.11**

**land-based communications hub**

land-based computer system that provides uniform access to multiple maritime satellite services, as well as access to public telephone networks, e-mail and the Internet

**2.12**

**ship earth station**

mobile earth station for maritime satellite service located aboard a ship

**2.13**

**software**

programs, procedures, rules and associated documentation pertaining to the operation of a computer system

**2.14**

**validation**

test and evaluation of an integrated computer system (hardware and software) to ensure compliance with the functional, performance and interface requirements

**2.15**

**ship information technology platform**

**SITP**

integrated system of software, hardware, communication links and standardized procedures that provide common services to shipboard systems in a standardized form

**2.16**

**verification**

process to determine if the product of each phase of the digital computer system development process satisfies the requirements set by the previous phase

**2.17**

**white box test**

test where the test plan is based on knowledge of the internal structure of the module being tested

See **black box test** (2.3)

**2.18****workstation**

computer and associated visual display unit (monitor) configured as an input/output (I/O) device to perform certain tasks

**3 Abbreviated terms**

For the purposes of this International Standard, the following abbreviated terms apply.

|       |                                                                   |
|-------|-------------------------------------------------------------------|
| ANSI  | American National Standards Institute                             |
| API   | application program interface                                     |
| CCITT | Consultative Committee for International Telegraphy and Telephony |
| DAC   | discretionary access control                                      |
| DBMS  | data base management system                                       |
| FMS   | fleet management system                                           |
| FMSN  | fleet management system network                                   |
| IBS   | integrated bridge systems                                         |
| IEV   | International Electrotechnical Vocabulary                         |
| LAN   | local area network                                                |
| NOS   | network operation system                                          |
| LITP  | land-based information technology platform                        |
| NMEA  | National Marine Electronics Association                           |
| SITP  | shipboard information technology platform                         |
| STEP  | standard for the exchange of product data (ISO)                   |
| VDU   | visual display unit                                               |
| WAN   | wide area network                                                 |

**4 FMS network architecture****4.1 General architecture**

The FMS architecture is shown schematically in Figure 1. The FMS is based upon a wide-area enterprise network, consisting of an unspecified number of SITPs and one or more shoreside LITPs which provides management services for the shipping enterprise. In total, the SITP enables multiple shipboard computer systems to share data with each other and to communicate with shore-based management and/or other vessels.