



国家出版基金项目
NATIONAL PUBLICATION FOUNDATION

国际海事组织海员行为示范

MODEL
COURSE 3.08

助航仪器和设备检验

SURVEY OF NAVIGATIONAL AIDS AND EQUIPMENT (2004)

中华人民共和国海事局 **译**



大连海事大学出版社
DALIAN MARITIME UNIVERSITY PRESS



国家出版基金项目
NATIONAL PUBLICATION FOUNDATION

国际海事组织海员行为示范

MODEL
COURSE 3.08

助航仪器和设备检验

SURVEY OF NAVIGATIONAL AIDS AND EQUIPMENT (2004)

中华人民共和国海事局 译



大连海事大学出版社
DALIAN MARITIME UNIVERSITY PRESS

国际海事组织 1990 年第一次出版

4 Albert Embankment, London SE1 7SR

© 中华人民共和国海事局 2016

图书在版编目(CIP)数据

助航仪器和设备检验:汉英对照/国际海事组织著;
中华人民共和国海事局译. — 大连:大连海事大学出版
社, 2016.1

(国际海事组织海员行为示范)

书名原文: SURVEY OF NAVIGATIONAL AIDS AND
EQUIPMENT

ISBN 978-7-5632-3279-6

I. ①助… II. ①国… ②中… III. ①助航设备-检
验-技术培训-教材-汉、英 IV. ①U644.8

中国版本图书馆 CIP 数据核字(2016)第 012202 号

大连海事大学出版社出版

地址:大连市凌海路 1 号 邮编:116026 电话:0411-84728394 传真:0411-84727996

<http://www.dmupress.com> E-mail: cbs@dmupress.com

大连住友彩色印刷有限公司印装

大连海事大学出版社发行

2016 年 1 月第 1 版

2016 年 1 月第 1 次印刷

幅面尺寸:210 mm×297 mm

印数:1~3000 册

印张:20.75

字数:638 千

出 版 人:徐华东

策 划:徐华东

责任编辑:杨 森 王 琴

责任校对:宋彩霞

封面设计:解瑶瑶

版式设计:孟 冀 解瑶瑶

ISBN 978-7-5632-3279-6

定价:52.00 元

国际海事组织海员行为示范 编审委员会

主 任： 郑和平

副主任： 林 浦 葛同林

委 员： 刘正江 杨万里 张安富 周明顺

朱可欣 于洪江 陆立明 陈永忠

王玉洋 王长青 陈国忠 唐春辉

韩杰祥 毛洪鑫 李蕙兰 饶滚金

石万里 王兴琦

《助航仪器和设备检验》

翻 译： 刘加钊 孟祥武

审 校： 胡甚平 刘肖沛 赵学军

Foreword

Since its inception the International Maritime Organization (IMO) has recognized the importance of human resources to the development of the maritime industry and has given the highest priority to assisting developing countries in enhancing their maritime training capabilities through the provision or improvement of maritime training facilities at national and regional levels. IMO has also responded to the needs of developing countries for postgraduate training for senior personnel in administrations, ports, shipping companies and maritime training institutes by establishing the World Maritime University in Malmö, Sweden, in 1983.

Following the adoption of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW), a number of IMO Member Governments had suggested that IMO should develop model training courses to assist in the implementation of the Convention and in achieving a more rapid transfer of information and skills regarding new developments in maritime technology. IMO training advisers and consultants also subsequently determined from their visits to training establishments in developing countries that the provision of model courses could help instructors improve the quality of their existing courses and enhance their implementation of the associated Conference and IMO Assembly resolutions.

In addition, it was appreciated that a comprehensive set of short model courses in various fields of maritime training would supplement the instruction provided by maritime academies and allow administrators and technical specialists already employed in maritime administrations, ports and shipping companies to improve their knowledge and skills in certain specialized fields. With the generous assistance of the Government of Norway, IMO developed model courses in response to these generally identified needs and now keeps them updated through a regular revision process taking into account any amendments to the requirements prescribed in IMO instruments and any technological developments in the field.

These model courses may be used by any training institution and, when the requisite financing is available, the Organization is prepared to assist developing countries in implementing any course.

E. E. MITROPOULOS

Secretary-General

前 言

国际海事组织(IMO)自成立伊始就认识到人力资源在海运业发展中的重要性,并最优先考虑通过在国家和地区层面上提供或改善培训设备来帮助发展中国家增强其海事培训能力。为应对发展中国家主管机关、港口、航运公司及海事培训机构高层人员对研究生培训的需求,IMO 于 1983 年在瑞典的马尔默成立了世界海事大学。

在《1978 年海员培训、发证和值班标准国际公约》(STCW)通过的初期,一些 IMO 成员国政府就建议 IMO 应制定示范课程,以帮助对该公约的实施以及对航海技术新发展方面信息和技能的迅速转化。IMO 培训顾问和咨询专家在对发展中国家的培训机构进行访问后确定,提供示范课程有助于教员改进现有课程的质量,也有助于提升对相关会议和 IMO 大会决议的实施。

此外,令人欣慰的是,海事培训领域中一套综合性简短课程将对海事院校提供的授课加以补充,并使得已在海事行政机关、港口和航运公司工作的行政管理人员和技术专家能够提高其在某些专业领域中的知识和技能。为此,在挪威政府的慷慨帮助下,IMO 编写了示范课程以应对那些普遍发现的需求,同时考虑到对 IMO 文件中规定要求的任何修正及该领域内的任何技术发展,通过定期修订程序对示范课程进行更新。

任何培训机构可以使用这些示范课程,在筹措到必需的资金时本组织也准备帮助发展中国家实施任何课程。

E.E.米乔普勒斯

秘书长

CONTENTS

	Page
Foreword	iv
Introduction	2
Part A: Course Framework	6
Part B: Course Outline and Timetable	14
Part C: Detailed Teaching Syllabus	18
Part D: Instructor Manual	92
Part E: Evaluation	120
Attachment: Guidance on the implementation of IMO model courses	126
Compendium	166

目 录

	页码
前言	v
介绍	3
A 部分:课程框架	7
B 部分:课程概要和时间表	15
C 部分:教学大纲细则	19
D 部分:教员手册	93
E 部分:评估	121
附件:IMO 示范课程实施指南	127
纲要	167

3.08 **MODEL COURSE**

Introduction

■ Purpose of the model courses

The purpose of the IMO model courses is to assist maritime training institutes and their teaching staff in organizing and introducing new training courses, or in enhancing, updating or supplementing existing training material where the quality and effectiveness of the training courses may thereby be improved.

It is not the intention of the model course programme to present instructors with a rigid “teaching package” which they are expected to “follow blindly”. Nor is it the intention to substitute audiovisual or “programmed” material for the instructor’s presence. As in all training endeavours, the knowledge, skills and dedication of the instructor are the key components in the transfer of knowledge and skills to those being trained through IMO model course material.

Because educational systems and the cultural backgrounds of trainees in maritime subjects vary considerably from country to country, the model course material has been designed to identify the basic entry requirements and trainee target group for each course in universally applicable terms, and the skill necessary to meet the technical intent of IMO conventions and skill necessary to meet the intent of IMO conventions and related recommendations.

■ Use of the model course

To use the model course the instructor should review the course plan and detailed syllabus, taking into account the information provided under the entry standards specified in the course framework. The actual level of knowledge and skills and prior technical education of the trainees should be kept in mind during this review, and any areas within the detailed syllabus which may cause difficulties because of differences between the actual trainee entry level and that assumed by the course designer should be identified. To compensate for such differences, the instructor is expected to delete from the course, or reduce the emphasis on, items dealing with knowledge or skills already attained by the trainees. He should also identify any academic knowledge, skills or technical training which they may not have acquired.

By analyzing the detailed syllabus and the academic knowledge required to allow training in the technical area to proceed, the instructor can design an appropriate pre-entry course or, alternatively, insert the elements of academic knowledge required to support the technical training elements concerned at appropriate points within the technical course.

Adjustment of the course objectives, scope and content may also be necessary if in your maritime industry the trainees completing the course are to undertake duties which differ from the course objectives specified in the model course.

Within the course plan the course designers have indicated their assessment of the time which should be allotted to each learning area. However, it must be appreciated that these allocations are arbitrary and assume that the trainees have fully met all the entry requirements of the course. The instructor should therefore review these assessments and may need to reallocate the time required to achieve each specific learning objective.

介 绍

■ 示范课程的目的

IMO示范课程的目的是协助海事培训机构及其教学人员组织和引入新的培训课程,提高、更新或补充现有的培训材料,以此改进培训课程的质量和培训效果。

本示范课程计划的意图并不是向教员呈交一个他们期望“盲目遵循”的“教学包”,其意图也不是用视听或“编排的”材料来代替教员的存在。在所有的培训努力中,知识、技能和教员的奉献是向IMO示范课程材料的受训者传授知识和技能的关键构成要素。

由于不同国家接受航海类培训的学员所处的教育体系和文化背景各不相同,所以示范课程采用通用术语设计,可以适应各课程受训目标人群的基本要求,并明确提出了需要满足的IMO有关公约及相关决议案所必需的技能的水平。

■ 示范课程的使用

为使用示范课程,教员应当审视课程计划和教学大纲细则,考虑课程框架中规定的入学标准所提供的信息。在审视过程中,应当牢记学员知识和技能的实际水准以及从前的技术教育水平,并应当识别出在教学大纲细则范围内由于学员实际入门水准与课程设计者假定的水准之间的差异,可能引起困难的任何部分。为弥补这些差异,希望教员将涉及学员已经掌握的知识和技能的项目从课程中删去或不做重视。此外,教员应当识别出学员可能还没有掌握的任何学术知识、技能或技术训练。

通过分析教学大纲细则以及技术领域培训所需的学术知识,教员可以设计出适当的预科课程,或者在技术课程中的适当处加入技术课程需要的学术知识。

如果完成该课程的学员在其所处的航海事业中要从事有别于本示范课程规定的课程目标的职责,则可能有必要调整课程的目标、范围和内容。

在课程计划中,课程设计者已经表明了其估计的、应分配给每一个学习部分的时间。但是,必须清楚的是,这些分配是主观的,并假设了学员完全符合本课程的入门要求。因此,教员应当对这些估计进行重新审视而且可能需要重新分配时间以符合每一个特定培训目标的需要。

■ Lesson plans

Having adjusted the course content to suit the trainee intake and any revision of the course objectives, the instructor should draw up lesson plans based on the detailed syllabus. The detailed syllabus contains specific references to the textbooks or teaching material proposed to be used in the course. An example of a lesson plan is shown in **Appendix 1**. Where no adjustment has been found necessary in the learning objectives of the detailed syllabus, the lesson plans may simply consist of the detailed syllabus with keywords or other reminders added to assist the instructor in making his presentation of the material.

■ Presentation

The presentation of concepts and methodologies must be repeated in various ways until the instructor is satisfied that the trainee has attained each specific learning objective. The syllabus is laid out in learning objective format and each objective specifies what the trainee must be able to do as the learning outcome.

■ Evaluation or assessment of trainees' progress

Guidance on evaluation or assessment of trainees is given in Part E of the course.

■ Implementation

For the course to run smoothly and to be effective, considerable attention must be paid to the availability and use of:

- properly qualified instructors;
- support staff;
- rooms and other spaces;
- equipment;
- textbooks, technical papers; and
- other reference material.

Thorough preparation is the key to successful implementation of the course. IMO has produced Guidance on the implementation of model courses, which deals with this aspect in greater detail.

■ 教案

完成了课程内容的调整和课程目标的修订,教师应当根据大纲细则拟写教案。大纲细则包括课程中使用的课本或教学材料特定的参考书,附录 1 提供了一份教案范例,若大纲细则中没有学习目标的调整之处,则教案可只包括大纲细则的关键词句,或其他教辅人员授课的提示性材料。

■ 学员展示

教师对概念的讲解和教学方法的运用必须以各种方式进行重复,直到学员掌握了每一个具体学习目标。大纲以学习目标的形式列出,每一个学习目标具体列出了学员必须能做的事情作为学习结果。

■ 评估

课程 E 部分提供了评估与测试的指导。

■ 实施

为使课程顺利有效进行,必须充分注意下列人员与设备:

- 称职的教员;
- 教辅人员;
- 教室和其他场所;
- 设备;
- 教科书、科技论文;和
- 其他参考资料。

完善的备课是成功实施本课程的关键。国际海事组织出版了“IMO 示范课程实施指南”,它更加详细地解释其实施方法。

Part A: Course Framework

■ Scope

The course is concerned with verification of compliance with the requirements of IMO conventions regarding the safety of ships, navigation and life at sea. It covers the requirements for the initial, annual, intermediate and periodical surveys, as specified in the International Convention for the Safety of Life at Sea, 1974 (SOLAS 74), as amended, and related documents,^{1,2} together with the necessary procedures for verification of these requirements including:

- suggested procedures for the carrying out of Convention requirements and detailed further in “Guidance” or “Recommendation” type documents relating to the Convention.
- suggested acceptance criteria, i.e. standards, parameters or guidance towards acceptance of the requirements.
- any other guidance necessary for the satisfactory determination of these survey requirements, with the aim of issuing the relevant certificates defined in the Convention.
- this course does not cover preliminary design or plan approvals, nor does it cover the survey or inspection of chemical tankers, gas carriers, special-purpose ships or mobile offshore units.
- the course should be supplemented by on-the-job training under the supervision of an experienced ship surveyor.

■ Objectives

The course, supplemented by appropriate on-the-job training, should enable those successfully completing it to:

- conduct on behalf of their Administrations the surveys and inspections required by the 1974 SOLAS Convention, as amended, in respect of navigational aids and equipment;
- report, as necessary on the results of such surveys and inspections to enable the Administration to issue or renew in respect of the ship concerned a Passenger Ship Safety Certificate or a Cargo Ship Safety Equipment Certificate and its Supplement, as appropriate, taking into account reports of surveys or inspections of materials, structure and other equipment in respect of which a certificate is to be issued or renewed, and to issue, renew or endorse the Attachment to the above-mentioned certificates;

1 Assembly resolution A. 948(23), “Revised Survey Guidelines under the harmonized system of survey and certification” intended to replace resolution A.746 (18) “Survey Guidelines under the harmonized system of survey and certification”.

2 The interpretation of any convention is a matter which must be decided by the Contracting Parties.

A部分:课程框架

■ 课程范围

本课程涉及验证船舶、航行和海上人命安全符合 IMO 公约的要求。其对于初次、年度、期间和定期检验的要求参考了经修订的《1974 年国际海上人命安全公约》(英文简称 SOLAS 74)^{1,2} 和相关文件,以及验证这些要求所必要的程序,包括:

- 履行公约要求的建议程序,详情参阅与公约相关的“指南”或“建议”性质的文件。
- 建议验收标准,如对验收要求的标准、参数或指南。
- 其他任何为达成满足检验要求所必需的指南,为签发《公约》中定义的相关证书。
- 本课程不包括对备课或对教学计划的认可,也不包括对化学品船、液化气船、专用船或可移动近岸平台的检验或检查。
- 本课程应将在有经验的验船师的监督指导下进行的在岗培训作为补充。

■ 教学目标

本课程应辅之以必要的在岗培训,其教学目标应完成下列各项:

- 按经修订的 1974 年 SOLAS 公约的要求代表政府实施对助航仪器和设备所进行的检验;
- 报告,作为必要的检验或检查结果,能使政府签发或更新船舶相关的“客船安全证书”或“货船设备安全证书”及其补充文件。对于需要签发或换新的证书的材料、结构和其他设备,适当虑及其检验或检查报告,以签发、更新或背书上述证书的附件;

1 准备用 A.948(23) 大会决议“经修订的船舶检验与发证协调系统(HSSC)检验导则”取代 A.746(18)决议“检验与发证协调系统(HSSC)检验导则”。

2 任何公约的解释必须由缔约方决定。

- identify, specify and require any repair or replacements in the above regards which may be necessary to permit issue or renewal of the above certificates; and
- monitor the conduct and effectiveness of such surveys and inspections carried out on behalf of the Administration under delegated authority.

■ **Entry standards**

Those wishing to undertake this course should be fully qualified deck officers or hold an equivalent qualification and have experience related to the survey or repair of navigational aids and equipment of ships.

Note: This course may also be used in cross-training experienced ship surveyors of other disciplines.

■ **Course certificate, diploma or document**

On successful completion of the course, a document should be issued certifying that the holder has completed a course of training at the required level of knowledge to conduct surveys of navigational aids. Authorisation to conduct such surveys should only be granted following successful completion of appropriate on-the-job training.

■ **Course intake limitations**

The ratio of trainees to instructors should not exceed 20:1 in tutorial sessions and 5:1 in practical training sessions.

■ **Staff requirements**

All training and instruction should be given by suitably qualified personnel. The senior instructor should be an experienced surveyor having a good knowledge of international requirements related to navigational aids and equipment as laid down by IMO conventions, Assembly and MSC resolutions and MSC circulars. Those teaching administrative aspects of survey control should also be experienced in these regards. At least one additional instructor with experience as a surveyor should be available if practical training can be arranged.

■ **Teaching facilities and equipment**

For tutorial sessions ordinary classroom facilities and an overhead projector are sufficient. When audio-visual materials are used, the appropriate equipment must be available.

For practical training, visits to ships are desirable. If these can be arranged, suitable protective clothing, tools and other equipment used for inspection and survey work will be required. Separate rooms equipped with a table and chairs to accommodate three or four groups of trainees during case studies and group assignments will be needed. Each room should be provided with a supply of paper and materials for producing overhead transparencies.

■ **Teaching aids (A)**

A1 Instructor Manual (Part D of the course)

- 识别、指定和要求对上述方面进行必要的任何修理或更换,以允许签发或更换上述证书;以及
- 根据委托代表政府监督此类检验或检查的实施及其有效性。

■ 入学标准

参加本课程的学员应该是合格的船舶驾驶员或持有相关证书并且具有船舶助航仪器和设备检验或维修经验的人员。

注意:本课程也可用于其他项交叉培训有经验的验船师。

■ 课程证书、文凭或证明

在圆满地完成本课程后,即颁发证书以证明证书持有者已完成助航设备检查所必备的知识水平的培训课程,且只有在今后完成相应在岗培训后,方可从事该项检验工作。

■ 课程人数限制

在理论课授课时,受培训的人数与培训者的百分比不得超过 20:1。在实操课阶段其比例不得超过 5:1。

■ 培训工作人员资格

所有的培训与指导应由合格的人员担任。高级教员应是有经验的验船师,精通 IMO 公约、大会和海上安全委员会(英文简称 MSC)决议、MSC 通函关于助航仪器和设备所制定的国际标准。检验控制方面的教学管理人员也应当有这方面的经验。如能安排实操,应至少再增加一名有验船师经验的教员。

■ 教学设施和设备

在理论课期间普通教室有一台投影仪即可,在使用视听材料时应具有相关的设备。

进行实操培训,比较有效的方法是到船上参观,如果此建议可行,应具备合格的防护服、工具及其他用于检验所必备的设备。应有单独的教室备有桌椅以供三至四组受训者进行个案研究和分组作业。每个教室应备有纸张、其他材料,以备打印幻灯片上的内容。

■ 教具(A)

A1 见培训人员手册(本课程 D 部分)