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MODEL  
COURSE 2.06

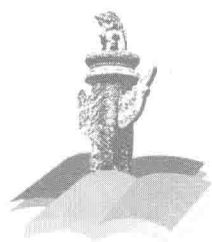
# 油船货油与压载操作模拟器

OIL TANKER CARGO AND BALLAST HANDLING SIMULATOR (2002)

中华人民共和国海事局 译



大连海事大学出版社  
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《油船货油与压载操作模拟器》

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# Foreword

Since its inception the International Maritime Organization 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 administration, ports, shipping companies and maritime training institutes by establishing the World Maritime University in Malmö, Sweden, in 1983.

Following the earlier adoption of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, 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 effectiveness in meeting the requirements of the Convention and implementing 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. IMO has therefore developed the current series of model courses in response to these generally identified needs and with the generous assistance of Norway.

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

W. A. O'NEIL

*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 and 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中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》通过的初期,一些 IMO 成员国政府就建议 IMO 应制定示范培训课程,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,提供示范教程有助于教员改进现有课程的质量,提高其满足公约要求及实施相关会议和 IMO 大会决议的有效性。

此外,令人欣慰的是,海事培训诸多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可以提高其在某些专业领域中的知识和技能。为此,IMO 在挪威的慷慨帮助下编写了当前的系列示范课程,以应对那些普遍发现的需求。

任何培训机构都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。

W.A.奥尼尔

秘书长

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# 2.06 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 audio-visual 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 to specify clearly the technical content and levels of knowledge and skill necessary to meet the technical intent of IMO conventions and related recommendations.

This is the first major revision to this model course. In order to keep the training programme up to date in the future, it is essential that users provide feedback. New information will provide better training in safety at sea and protection of the marine environment. Information, comments and suggestions should be sent to the Head of the STCW and Human Element Section at IMO, London.

## ■ Use of the model course

To use the model course the instructor should review the course outline 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.

Adjustment of the course objective, 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 amount of time which should be allotted to each area of learning. *Teaching staff should note that the sequence and length of time allocated to each subject are suggestions only.*

# 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术内容、知识和技能的水平。

这是本示范课程的首次重要修订。为使培训项目能够始终与时俱进,用户的反馈意见至为关键。新的信息将有助于提供更好的海上安全和海洋环境保护方面的培训。如果您有信息、意见和建议,请投递至设在伦敦的STCW总部和IMO人为因素科。

## ■ 示范课程的使用

为使用示范课程,教员应当审视课程概要和教学大纲细则,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。

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,课程设计者对每个知识点的时间分配进行了预估。教员应注意到,课程顺序和学时的安排只是课程设计者的建议。

*These factors may be adapted by lecturers to suit individual groups of students according to their experience and ability as well as equipment and staff available for training.*

By analysing 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.

Within the course outline, Part 2, the course designers have indicated their assessment of the time which should be allotted to each subject area. *However, it must be appreciated that these allocations are suggestions only. These factors may be adapted by lecturers to suit individual groups of students according to their experience and ability as well as equipment and staff available for training and assume that the trainees have fully met all 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.

## ■ 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 included in the instructor manual in most model courses, but in this course, the exercise scenarios supplied as an appendix to the instructor manual serve this purpose. 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, by testing and evaluating the trainee's performance and achievements, 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. Taken as a whole, these objectives aim to meet the knowledge, understanding and proficiency specified in the appropriate tables of the STCW Code.

## ■ Evaluation or assessment of trainee progress

The nature of this course involves all of the trainees and the instructors in an ongoing process of individual and group evaluation.

## ■ Implementation

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

教员可根据每组学员的经验、能力、培训设施设备和师资力量进行重新调整。

通过分析大纲细则和开展该技术领域的培训所需的理论知识，教员可以设计适当的预科课程，或者在课程适当的地方穿插一些支持技术培训相关要素的理论知识。

在第2部分的课程概要中，课程设计者对完成每个科目所需学时进行了预估。但必须意识到这些课时仅仅是课程设计者的一个建议。教员应根据每个学员小组的经验和能力，以及设备和可用的师资，同时在假设学员全部符合课程入学条件的情况下，对课程的内容进行调整。因此，教员应该参考这些预估学时，并根据每个具体学习目标重新设定所需的学时。

■ 教案

在为适应招收的学员以及课程目标的修正而调整课程内容之后，教员应当基于大纲细则拟定教案。大纲细则中有教科书具体的参考书目以及计划用于课程的教学资料。在多数示范课程中，教员手册都有一个教案的例子，但在本课程中，教案实例将在教员手册的附录中以训练脚本的形式出现。若大纲细则中的学习目标没有调整的必要时，则可将大纲细则附以关键词和注解作为教案，以协助教员讲解相关内容。

■ 学员展示

对概念和方法的讲解应通过各种不同的方式不断重复，直到通过学员的测试及其表现与成果的评估，使得教员满意地认为学员达到了课程学习的目的为止。教学大纲以学习目标的形式，并把学员最终必须能做什么作为学习成果。总之，这些目标主要是为了满足STCW规则相应表格中所列的“知识、理解和熟练”的具体要求。

■ 对学员学习进程的评价

该课程的本质决定了在整个教学过程针对个人和小组持续评价中将涉及所有学员和教师。

■ 实施

为使课程顺利进行和卓有成效，必须充分注意下列资源的获得和使用：

- 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 a booklet entitled “Guidance on the implementation of IMO model courses”, which deals with this aspect in greater detail. A copy of this booklet is included as an attachment to this course.

## ■ Training and the STCW 1995 Convention

The standards of competence that have to be met by seafarers are defined in Part A of the STCW Code in the Standards of Training, Certification and Watchkeeping for Seafarers Convention, as amended in 1995. This IMO model course has been revised and updated to cover the competences in STCW 1995. It sets out the education and training to achieve those standards.

For ease of reference, the course is divided into separate sections.

Part 1 provides the framework for the course with its aims and objectives and notes on the suggested teaching facilities and equipment. A list of useful teaching aids, IMO references and textbooks is also included.

Part 2 provides an outline of lectures, demonstrations and exercises for the course, together with a suggested sequence and timetable. From the teaching and learning point of view, it is more important that the trainee achieves the minimum standard of competence defined in the STCW Code than that a strict timetable for each topic is followed.

Depending on their experience and ability, some students will naturally take longer to become proficient in some topics than in others.

Part 3 gives the Detailed Teaching Syllabus. This is based on the theoretical and practical knowledge specified in the STCW Code. It is presented in a logical sequence, starting with basic knowledge and information on petroleum and its hazards, safety and pollution prevention, and concluding with inert gas systems and crude oil washing operations. Each subject area is covered by a series of *required performances*, in other words what the trainee is expected to be able to do as a result of the teaching and training. In this way the overall required performance of knowledge, understanding and proficiency is met. IMO references, textbook references and suggested teaching aids are included to assist the teacher in designing lessons.

- 完全合格的教员;
- 辅助人员;
- 教室或其他场所;
- 设备;
- 教科书、技术论文;和
- 其他参考资料。

充分的准备是课程成功实施的关键。IMO制定了《IMO示范课程实施指南》,作为本课程的附件给出,指南对此有更详细的阐述。

## ■ 培训和STCW 1995公约

《海员培训、发证和值班标准国际公约》(经1995年修正)中STCW规则中A部分对船员必须满足的适任能力标准进行了定义,为覆盖STCW 1995公约对适任能力的要求,IMO示范课程也做了相应的修订,制定了为达到这些标准所需的教育和培训内容。

为了便于参考,课程分为几个独立的部分。

第1部分给出了课程整体框架,包括课程的目的、教学目标以及推荐的教学设施设备,还包括一个有用教具、IMO参考书目和教科书的清单。

第2部分为课程的讲授、演示和练习提供了课程概要,以及推荐的教学顺序和时间表。但从教与学的角度出发,使学员达到STCW规则所要求的最低适任标准比严格遵循时间表要重要得多。

根据经验和能力的不同,有些学员在某些主题方面达到精通的程度要比其他学员所需的时间更长。

第3部分基于STCW规则所规定的理论和实践知识给出了详细的教学大纲。大纲按照逻辑顺序进行编写,先从石油的基本知识和信息开始,再到石油的危害、安全和污染防治,直至惰气系统和原油洗舱的操作。每个主题范围都有一系列的技能要求,换句话说,受训者都要达到学习和训练所要求的结果。通过这种方式,对学员所有关于“知识、理解和熟练”方面的要求都能得到满足。为帮助教师进行课程设计,还包含了IMO参考资料、教学参考书和推荐的教具。

Part 4 contains an Instructor Manual with additional explanations, an example lesson plan and simulator exercise for instructors who may have access to a liquid-cargo-handling simulator.

The Convention defines the minimum standards to be maintained in Part A of the STCW Code. Mandatory provisions concerning Training and Assessment are given in Section A-1/6 of the STCW Code. These provisions cover: qualification of instructors; supervisors as assessors; in-service training; assessment of competence; and training and assessment within an institution. A corresponding Part B of the STCW Code contains non-mandatory guidance on training and assessment.

A separate IMO model course addresses Examination and Assessment of Competence. This course explains the use of various methods for demonstrating competence and criteria for evaluating competence as tabulated in the STCW Code and may be helpful in developing any necessary assessments.



第4部分为教员手册,包含附加注释、教案实例和为教员设计的液货装卸模拟器练习。

该公约在STCW规则A部分中规定了要保持在最低标准。有关培训和评估的强制性规定在STCW规则第A- I/6节中载明。这些规定包括:教员的资格;作为评估员的监督员;在职培训;适任能力评估;以及院校内的培训和评估。STCW规则中相应的B部分载有培训和评估的非强制性指南。

另外,有一独立的IMO示范课程为“考试和适任能力评估”。该课程阐述了展示适任能力所用的不同方法和适任能力评估的标准,这些方法和标准在STCW规则的表格中列出,对开发一些必要的评估项目有帮助。