

# 驾驶台资源管理

Bridge Resource Management

(中英文对照)

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## 内容提要

本书全面系统地论述了驾驶台资源管理的理论和方法。全书共分 10 章, 主要内容包括: 引言; 态度与人为失误; 通信与沟通; 决策制定; 规划与组织; 管理技能与领导艺术; 工作负荷、疲劳与压力; 驾驶台团队工作; 应急策略; 案例等。本书可作为船长和负责航行值班的高级船员的培训用书, 也可作为高等学校航海技术专业的教材和参考书。

# 前 言

船舶安全涉及到人、船、环境和管理等各方面的因素。以往发生的海上交通事故表明,由于人为失误或疏忽造成的事故占事故总数的80%以上。如何减少这类事故的发生,成为困扰航运界的最重要的问题之一。

STCW95公约是关于海员培训等方面的一个非常重要的国际公约。它在其B-VIII/2部分(非强制部分)对各缔约国船公司以指导性建议的方式提出了驾驶台资源管理的概念及其内容,强调了船舶驾驶人员团队工作训练的重要性,并指出:参加驾驶台团队工作的人员必须由足够的、称职的和不同职级的航海人员组成,他们必须分工明确、责任到人,彼此间的对话与联系应明确无误,集中精力工作,能随时对环境与局面的变化做出及时反应和采取有效的措施。根据IMO的要求,为了确保船舶的安全与营运效益,瑞典、挪威、芬兰等欧洲国家的交通与海事安全主管部门、船东协会、航运公司和引航员协会等在借鉴北欧航空公司(SAS)飞行团队管理和控制课程(CRM)的经验,并在自我开发船舶驾驶人员安全教育与技能培训课程的基础上,共同研发了驾驶台资源管理(Bridge Resource Management, BRM)。

从目前趋势来看,欧美国家许多航运公司的船员都进行了这方面的培训,取得了比较好的效果。BRM提倡的安全操作程序所带来的效益不是仅局限于船舶驾驶员值班,而是船舶营运过程中涉及的方方面面。

本书从管理行为学的角度阐述了驾驶台团队成员的态度与人为失误;通信与沟通;决策制定;规划与组织;管理技能与领导艺术;工作负荷、疲劳与压力;紧密结合驾驶台团队工作的特点,

阐述了航行计划的拟定、执行与监控的团队工作情况；针对应急行动的特殊性，提出了应急策略；最后用详实的案例说明驾驶台资源管理的重要性。

本书在王凤武、毕修颖编写的《驾驶台工作与管理》基础上，由王凤武和张卓共同构思，王凤武编写第一、二、四、七、八、十章；张卓编写第三、五、六、九章，最后，由王凤武统稿。虽然我们在撰写和修改定稿过程中反复研讨和再三斟酌，但是由于我们水平有限，书中难免有不当或失误之处，敬请读者批评指正。

在本书撰写和修改过程中，承蒙大连海事大学洪碧光船长、教授和顾萍老师在百忙之中仔细审阅了全部书稿并提出宝贵的修改意见；大连海事大学刘正江教授提供了大量的资料；大连海事大学航海学院院长东昉教授、成人教育学院院长丁勇教授、航海学院副院长戴冉副教授给予关心和指导，在此一并致谢。

作者

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# 第一章 引 言

## 第一节 驾驶台资源管理的概念

### 一、国际海事组织的规定

国际海事组织在 1995 年修订的《1978 年海员培训、发证和值班标准国际公约》的 B-VIII/2 部分“关于值班安全和应遵循原则的指导”的“驾驶台资源管理”中指出：公司需向各船船长和负责航行值班的高级船员以驾驶台资源管理原则为基础的，关于驾驶台值班人员如何配置和使用的持续评估的必要性的指导，即：

要有足够的合格人员值班，以保证有效地履行各种职责；所有参与值班的人员都需具有相应的资格并适于充分地履行其职责，或者负责航行值班的高级船员在做出航行或操作决定时需考虑到每个值班人员的资格或适合性的局限性；分派给每个人的职责需明确无误，他们需证实已明白自己的责任；工作任务需按明确的先后次序完成；不要给任何航行值班人员分派其不能有效完成的过多或过难的工作任务；任何时候对每个人都需分派其最能充分有效履行其职责的岗位，当情况需要时，需另行分派岗位；对航行值班人员，不要分派给不同的职责、任务或岗位，除非负责航行值班的高级船员确信这种调整能充分有效地完成；履行职责所必需的仪表和设备需备妥，使负责航行值班的相应人员随时

# **1 Introduction**

## **1.1 The Conception of Bridge Resource Management**

### **1.1.1 The Requirement of IMO**

Bridge resource management of guidance regarding watchkeeping arrangements and principles to be observed in STCW78/95, Code Section B-VIII/2 address that companies should issue guidance to masters and officers in charge of the navigational watch on each ship concerning the need for continuously on bridge resource management principles such as the following:

A sufficient number of qualified individuals should be on watch to ensure all duties can be performed effectively; all members of the navigational watch should be appropriately qualified and fit to perform their duties efficiently and effectively or the officer in charge of the navigational watch should take into account any limitation in qualifications or fitness of the individuals available when making navigational and operational decisions; duties should be clearly and unambiguously assigned to specific individuals, who should confirm that they understand their responsibilities; tasks should be performed according to a clear order of priority; no member of the navigational watch should be assigned more duties or more difficult tasks than can be performed effectively; individuals should be assigned at all times to locations at which they can most efficiently and effectively perform their duties, and individuals should be reassigned to other locations as circumstances may require; members of the navigational watch

可用；航行值班人员之间的通话需清楚、迅速、可靠，并与所从事的业务有关；非紧要的活动和使人分心的活动需避免、禁止或取消；所有驾驶台设备需工作正常，否则，负责航行值班的高级船员在做出操作决定时需考虑到可能存在的任何故障；需收集、处理和解释一切重要的信息，并使之便于为履行其职责而需要这种信息的人员使用；驾驶台或任何工作面上不得放置无关东西；并且航行值班人员在任何时候均需做好准备，以便充分有效地对环境改变做出反应。

国际海事组织于 2001 年在 STCW 分委会通过了示范教程（MODEL COURSE）1.22 有关船舶模拟器与驾驶台团队工作的决议，其目的就是在训练中，要求受训者有效利用驾驶台程序，遵守 1972 年国际海上避碰规则（CLOREG1972）及 STCW95 公约中 VIII/2、A-III/2 和 B-III/2 规定的有关航行值班的基本规则。让受训者担任值班中的不同角色，并进行轮换，给每个受训者提供一个作为船长的训练机会。

成功地完成这个教程的受训者将获得在各种不同情况

should not be assigned to different duties, tasks or locations until the officer in charge of the navigational watch is certain that the adjustment can be accomplished efficiently and effectively; instruments and equipment considered necessary for effective performance of duties should be readily available to appropriate members of the navigational watch; communications among members of the navigational watch should be clear, immediate, reliable, and relevant to the business at hand; non-essential activity and distractions should be avoided, suppressed or removed; all bridge equipment should be operating properly and if not, the officer in charge of the navigational watch should take into account any malfunction which may exist in making operational decisions; all essential information should be collected, processed and interpreted, and made conveniently available to those who require it for the performance to their duties; non-essential materials should not be placed on the bridge or any work surface; and members of the navigational watch should at all times be prepared to respond efficiently and effectively to changes in circumstances.

Sub-committee on STCW of IMO has identified the ship simulator and bridge teamwork (1.22) of model course, the objective is that during exercises, trainees are expected to make use of effective of bridge procedures, to comply with International Regulations for Preventing Collisions at Sea, 1972 (COLRG 1972) and to observe the basic principles of keeping a navigational watch, as set out in regulation VIII/2, section A-VIII/2 and B-VIII/2 of the STCW 95 Convention and Code. They will assume the different roles of the bridge watchkeeping team, the roles being rotated to allow each trainee an opportunity to act as master for some of the exercises.

The trainees who successfully complete this course will have

下操纵船舶的经验，并能在船舶正常和发生故障的紧急情况下做出有助于驾驶台工作的有效行动。

特别地，受训者应达到：

—熟悉车舵操作；

—掌握风、流、浅水、岸壁、狭水道作用和船舶载态对船舶的影响；

—加强对制定计划航线和备用航线重要性的认识；

—在一般或特殊情况下，对值班和装卸货作业过程中驾驶台各项措施和团队工作的有效性有深刻的认识；

—加强理解互动通信和建立一个共享的计划航线的好处。

## 二、驾驶台资源管理的概念

资源是指可利用的资产(牛津英文字典)或是用以维持的财产(剑桥字典)。管理是其技艺和行为，是指导或运用任何事情的方法(剑桥字典)或是对一个企业的控制和组织等(牛津英文字典)。

资源管理是指对可利用的资产或用以维持的财产的控制和组织或是管理机构对可利用的资产或用以维持的财产的管理技艺或行为，或娴熟的处理。

驾驶台资源管理是指一个管理机构对驾驶台工作环境中的可利用资产的控制和组织；或是一个管理机构对驾驶台工作环境中的可利用的资产的管理技艺或行为处理。船舶驾驶

gained experience in handling ships under various conditions and will make a more effective contribution to the bridge team during ship manoeuvring in normal and emergency situations.

In particular, trainees will gain:

—Familiarization with the use of engines and helm for ship manoeuvring;

—An understanding of effects on the behaviour of the ship of wind, current, shallow water, banks and narrow channels and condition of loading;

—A greater awareness of the importance of planning a passage or manoeuvre and need for an alternative plan;

—A greater understanding and awareness of efficient bridge procedures and bridge teamwork during watchkeeping and ship handling; in normal and in emergency situations;

—A greater awareness and understanding of a good interactive communication style and building up a common shared mental model of the planned passage.

### **1.1.2 The Conception of Bridge Resource Management**

Resource is the available assets (Oxford English dictionary) or is the means of support (Chambers dictionary). Management is the art or act of managing; the manner directing or of using anything (Chambers dictionary) or is the control and organization of a business, etc (Oxford English dictionary).

Resource management is the controlling and organization of available assets or means of support or is the art or action of managing, or the skillful treatment of available assets or means of support by a body of managers.

Bridge resource management (BRM) is the controlling and organization of the available assets of the bridge working environment by a body of managers, or bridge resource management is the art or act of managing, or the skillful treatment of the available

台资源管理也称船舶驾驶台团队管理，是指为达到船舶安全营运的目的而对所有的人力与技术资源和驾驶台团队成员的技能、经验的有效管理与运用。这种资源既指在船工作的船员，也包括诸如设备、仪器、物品、备件等的硬件；命令簿、手册、指导书、海图、计划等的软件，还有包括时间、技能与经验等其他资源。

驾驶台资源管理强调的是驾驶员在团队工作、团队形成、联系与沟通、领导、决策和管理等方面的技术，并将这一技术运用到有组织 and 有规律的管理之中。驾驶台资源管理是对压力、态度和危险等操作性任务的管理，在计划中，有许多有效而安全的因素如个人的、组织的和规则的因素。这种管理贯穿于航行计划的开始、执行和结束。

## 第二节 培训目的

在海损事故绝大多数是因人为因素造成的观点已形成共识的今天，很多人都认为只要航运公司的船员具有良好的知识与技能，并制定了相关的操作程序与规定，就能保证船舶的本身的安全和营运效益。实际上，除了上述这些重要的因素外，船员对待自己工作的态度和日常管理技能在船舶安全和营运效益上也有着非常重要的作用。因此，为了提高和确



assets of the bridge working environment by a body of managers. Bridge Resource Management on board, or as it is also called Bridge Team Management (BTM), is the effective management, utilization and co-ordination of all resources, human and technical, all the skills, knowledge, experiences and resources available to the bridge team work to accompany or achieve the established goals of safety and efficiency of passage. The resources on board are that crew: personnel working on board ship; hardware: equipment, instruments, tools, stores, spare parts, etc; software: standing orders, manuals, guide books, charts, plans, etc and others: time, skills and experience.

BRM focuses on bridge officers' skills such as teamwork, teambuilding, communication, leadership, decision-making and resource management and incorporates this into the larger picture of organizational and regulatory management. BRM addresses the management of operational tasks, as well as stress, attitudes and risk. BRM recognizes there are many elements of job effectiveness and safety, such as individual, organizational, and regulatory factors, and they must be anticipated and planned for. BRM begins before the voyage with the passage plan and continues through the end of the voyage with the passage debrief.

## **1.2 The Objectives of Bridge Resource Management**

The common recognizing has been formed today that the human errors are caused in most of marine accidents. Most of people consider that as long as the crews have good knowledge, skill and procedures and regulations to make, the safety and effective business can be maintained. Actually, besides the above factors, the working attitudes and routine skills of management of crew are very important for safety and effective business. For