符合 STCW'78/95 公约要求
海船船员适任证书考试用培训教材

通信英语

Communication English

（GMDSS 操作级／管理级适用）

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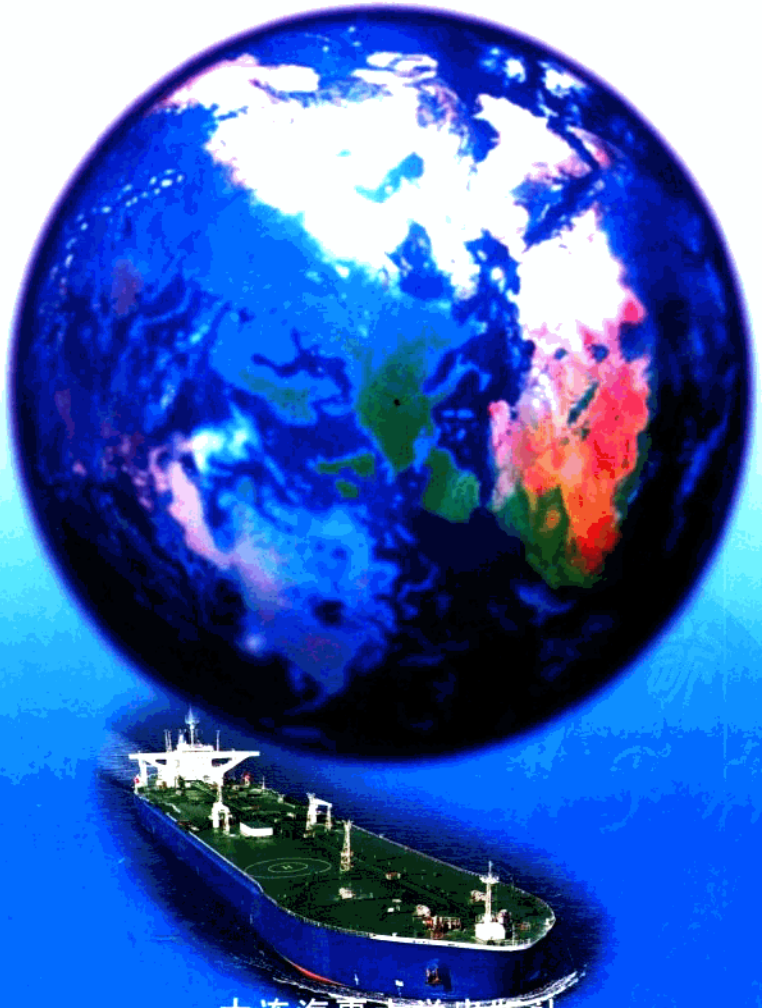

大连海事大学出版社

内 容 提 要

全书共七章，主要内容有：缩写词及术语定义，GMDSS 系统概述及相关的国际公约，INMARSAT 系统和状态记录系统，地面系统与设备，电文种类、写作方式，无线电信号书第一卷选读。

本书可作为船员 GMDSS 培训教材和航海院校通信英语教材。

前　言

STCW 95 修正案实施后，为了履行 STCW 78/95 公约，中华人民共和国海事局于 1997 年组织了考试大纲制订工作。为了更好地完成通信英语的教学及培训工作，履行中华人民共和国最新出版的海船船员考试及评估大纲中“通信英语”子纲，我们几位曾参加大纲编写及调研工作的同志又重新详细研究推敲了“通信英语”考试大纲，并根据大纲的要求编写了本教材。该教材涵盖了大纲中所要求的所有考试内容，如相关的国际公约、典型设备操作指南、GMDSS 系统概论、卫星系统等等。涵盖了一级无线电电子员、二级无线电电子员、通用操作员、限用操作员对通信英语要求的内容。该教材适合作为院校通信英语课程和 GMDSS 考前培训教材。

该教材编写分工如下：第一章由徐东华编写，第二章由王晓锐编写，第三章由苏振庭编写，第四章由张晓峰编写，第五章由赵小东编写，第六章由李瑞云编写，第七章由于成河编写，附录由张海昕编写；全书由张晓峰统稿，张绪吾主审。

大连海事大学成人教育学院方文治院长、大连海事大学航海学院丁勇副院长、大连海运学校陈放校长助理、大连海运学校教务处刘英贤处长在编写中给予了指导与帮助，孙丽红老师参与了第二章词汇收集与整理工作，在此一并表示感谢。

编　者

1999 年 2 月

目　录

Chapter One GMDSS Abbreviations & Terms
第一章 GMDSS 缩写词及名词术语

一、缩写词及术语概述

GMDSS 中缩写词和术语占很大的比例。在通信中缩写词及术语的运用目的在于通过省略与简化来达到完整地表达 GMDSS 相关内容或将特殊内容专业化的目的，并能节省篇幅及传递时间。缩写词的来源是通过大量的报文中经多次缩写实践中约定俗成的，也有部分缩写词由各种公约及 GMDSS 宣传资料所规范而成的。GMDSS 术语则主要来源于国际公约的术语和定义部分，如 SOLAS 公约、国际电信规则、商船搜救手册、GMDSS 示范课程等等。缩写词的读音一般是按单字母拼读，但一般缩写词在同领域被广泛接受，并被推广至社会各界后就会变成一般的单词，其读音应按单词读音处理。如 radar['reidə](radio detection and ranging)雷达、laser['leizə](lightwave amplification by stimulated emission of radiation)镭射。但在航海系统范围内使用的缩写词其写法仍然是大写，但读音可以按单词发音，如 SART[Sɑ:T]EPIRB['ipəb]。术语的理解也决不能望文生意，而应从原公约中查出有关的原文解释。如 distress alerting 定义为 the rapid and successful reporting to a unit which can provide assistance 而并非简单的 distress 加 alerting 的单词组合。

1. 缩写词的缩减方式

GMDSS 相关的缩写词的缩写方式有几种，但归纳起来主要有：截除词尾、截除词首、截去首尾、截除词腰、个别字符省略、首字符拼成、取发音明显单元七种。

截除词尾即只有单词起首部分，去掉单词后半部分，常见于通信报文中，如 CH(channel)信道、ACK(acknowledge)感谢、ANCH(anchorage)锚地。

截除词首即只保留单词后半部分，去掉前半部分，如 phone(telephone)电话、plane(aeroplane)飞机、scope(telescope)望远镜。

截除首尾主要是因为该字太长且中间部位特征明显而去掉词的首尾保留中间，如 flu(influenza)流感；frige(refrigerator)电冰箱。

截除词腰即把一个词的中间或两个词组合的第一个单词词尾或第二单词词首截掉而形成的缩写词，如 NAVTEX(navigational telex)航警电传，NAVAIDS(navigational aids)助航仪器，Hz(Hertz)赫兹等等。

个别字符省略常见于文学作品，在 GMDSS 中较少。但 GMDSS 中使用时主要原因是计费时为了省字，且省掉一二个字母对方仍然可以知道这个单词不影响原文的理解，如 e'en(even)，e'er(ever)，o'er(over)。

捡重音节和辅音字母的缩写词，这些缩写词也常见于无线电报文中，如 ARVL(arrival)抵达，AVLBL(available)必备，BDL(bundle)一捆，CFM(confirm)证实，RGDS(regards)致敬，HQ(headquarters)总部。

最常见的 GMDSS 缩写词就是由各个英文单词的首词符为基础的缩写组合，以及以首字母为基础的缩写组合。如 CR(carriage return)回车，LUT(Local User Terminal)本地用户终端，

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MID(Maritime Identification Digits)海上识别数字, SSB(Single Side Band)单边带, INMARSAT(International Maritime Satellite)国际海事卫星。

个别缩写词考虑到单词的发音, 如

WRU(Who are you?)你是哪个台?

MSG 4 U(message for you)现在有报文给你。

WZ(with)伴随着。

2. GMDSS 缩写词的分类

缩写词的种类很多, 分布很广, 但大致上可以分下列几大类:

缩写词的组织类, GMDSS 有很多相关的国际组织, 有一些还有所属关系。如 U.N 包含 IMO, ITU 等组织, IMO 包括 MSC, ITU 包括 WARC 等等。

下列组织为与 GMDSS 有关联的国际组织缩写:

UN, CCITT, INMARSAT, ITU, MSC, IMO, ITU, WARC, MCC, NCC, NCS, PTT, WMO, BIH, CES

缩写的词公约类, 由于 GMDSS 形成于很多公约中, 每个公约中都有规定, 不能单纯由一个公约表述, 因此下列公约均与 GMDSS 有关联, SOLAS, STCW, RR, SAR Convention。

缩写词的出版物类, 有关 GMDSS 内容的出版物很多, 如 GMDSS 有关设备的说明书的前言部分, 一些英版海事出版物等等, 由于出版物名字较长, 大多有缩写形式, 如 ALRS, ANM, MERSAR, IMOSAR。

缩写词的技术和设备类, 缩写词有不少是有关 GMDSS 相关技术的, 如 DSC, EDI, DHSP, AGC, CR。也有不少是关于 GMDSS 设备类的, 如 EPIRB, NBDP, INMARSAT—A, INMARSAT—B, INMARSAT—C, INMARSAT—M, SSB 等等。

缩写词的系统类, 与 GMDSS 相关的系统有主系统 INMARSAT, 报警系统 COSPAS—SARSAT, 定位系统 GPS 或 NNSS, 船位报告系统 AMVER, JUSREP, AUSREP。

缩写词的标称单位类: Hz, kHz, MHz, GHz, BPS, M(nm), m, cm, KT 等等。

用于收发电文的缩写词或词组: GA^{+}, CGO, PKG, PRT, PY, RGDS, RYTC。

此外, 如果在 GMDSS 英语考试中遇到了相关缩写词, 可以借助词典完成。但查字典时一定要保证所查词意和 GMDSS 相关, 一词的含义有多个, 一定要认真取舍。

如 MID 有 midship 船中、正舵, Maritime Identification Digits 海上识别数字, 应取后者。

二、练习

1. 把下列缩写词按相同性质分类

ID, TDM, VHF, PSDN, INMARSAT, MMSI, ROC, CES, AGC, IOR, kHz, FAX, PEC, GA+, WRU

2. 写出下列缩写词的中文含义

CCITT, NNSS, ASM, ARQ, AUSREP, BPS, LF, GRI, FTC, ID

3. 写出下列单词的英文全拼

BLNCE, DF, AGN, AMVER, BDL, C/O, CAPT, M.V, WZ, MCC

4. 写出下列术语的英文解释

Distress Alerting, GMDSS, SART, Area Al, Area A2, DSC, Bridge-to-bridge Communication, UTC, Ship Station, Public Correspondence

Chapter Two Introduction on the Global Maritime Distress and Safety System
第二章 全球海上遇险和安全系统的介绍

PART ONE HISTORY OF MARITIME SAFETY COMMUNICATIONS

第一节 海上安全通信的历史

Beginning

Radio was first used to save life at sea in March 1899 when it was used by a lightship to report that the steamer "Elbe" had run aground. It was also in 1899 that the first ship was fitted with radio[1]. Since that time radiocommunications have proved to be of paramount importance to safety at sea.

In 1912, some three months after the passenger ship "Titanic" disaster[2] with the loss of more than 1500 lives, an international radio conference, met in London to review and amend the 1906 International Radiotelegraph Convention which prescribed the distress and calling frequencies[3], classes of ship service(watchkeeping), ships radio equipment, requirements for certification of operators for ship stations. Later in January 1914, also in London, an international maritime conference adopted the first International Convention for the Safety of Life at Sea (SOLAS), which required certain ships to carry an MF radiotelegraph installation.

The Existing Distress System

The subsequent 1929, 1948, 1960 and 1974 SOLAS Conventions all required passenger ships and cargo ships of 1600 tons gross tonnage and upwards to carry a radiotelegraph station. It was not until 1948 that requirements for MF radiotelephone stations were included in the convention and then only for ships of between 300 and 1600 tons gross tonnage not fitted with an MF radiotelegraph station. Limited requirements for a VHF radiotelephone station for safety of navigation were included in SOLAS in 1974 but it was not until 1981 that requirements for all SOLAS ships to be capable of communicating with each other by VHF and MF radiotelephone were achieved[4].

Subsequent World Administrative Radio Conferences (WARC) convened by the International Telecommunication Union(ITU) provided the radiotelephone distress call, radiotelephone distress and calling frequencies and reduced the distress bands as radio technology and equipment improved.

Until 1960, when IMO came into being, the ITU was solely responsible for all aspects of maritime radiocommunications, including distress and safety radiocommunications. The 1960s saw great changes and improvements in radiocommunications systems, e.g. satellite communica-

tions, selective calling, direct-printing telegraphy, etc. Both ITU and IMO recognized the advantages of these systems for improving all maritime radiocommunications.

The existing Morse radiotelegraphy and radiotelephone system, with a required MF communication range of 100-150 nautical miles, provided a distress system based on alerting, if time permitted, ships in the vicinity of the distress and coast stations within range[5]. The system therefore did not cover ships which suddenly sank or ships in distress which were too far away from those who could assist.

Improvement of Maritime Radiocommunications

In February 1966 IMO decided to study the operational requirements for a maritime satellite communication system and in 1967 the ITU WARC invited IMO to continue this work.

In the early 1970s, IMO in close co-operation with ITU's International Radio Consultative Committee (CCIR), started active preparations for the establishment of a maritime satellite communication system to serve the maritime community; CCIR preparing the technical bases of the system and IMO the operational requirements, a cost benefit analysis and a draft convention, which was adopted in 1977 and resulted in the establishment of the INMARSAT Organization in 1979[6]. The work of INMARSAT is the subject of another lecture, however, attached at Annex, is an address by Mr. C.P. Strivastava the previous Secretary-General of IMO to the 1989 INMARSAT International Conference, on the creation of INMARSAT and co-operation in developing the GMDSS which should be of interest[7].

In 1973 IMO adopted resolution A.273(VIII), a policy document on development of the maritime distress system which outlined the steps that should be taken to gradually improve the existing system and ultimately achieve what was then the distant future system and is now known as the Global Maritime Distress and Safety System (GMDSS)[8].

IMO also sought to improve search and rescue (SAR) world-wide for those in distress at sea and, concurrent with the development of the INMARSAT Convention[9], Prepared the SAR Convention which was adopted in 1979. SAR under the Convention is based upon co-ordination of all SAR operations, wherever they occur in the world, by responsible authorities ashore(rescue co-ordination centres(RCCs)). As MF and VHF communications have limited range, in order to enable RCCs to meet their responsibilities under the SAR Convention, ships operating outside MF range needed a long range HF or satellite communication capability[10].

The advent of INMARSAT enabled the development of the GMDSS through a carefully considered integration of satellite and modern terrestrial radiocommunication techniques and procedures. Development of the GMDSS required very close co-operation between ITU and IMO, IMO developing the operational requirements and equipment performance standards and CCIR recommending the equipment technical specifications and procedures for its use, the ITU 1983 WARC adopting necessary provisions in the Radio Regulations to test the system and prove the various equipment to be used, the ITU WARC-MOB 87 adopting the necessary amendments to the Radio Regulations to introduce the GMDSS and IMO adopting in 1988 amendments to the SOLAS Convention, to implement the GMDSS on ships[11].

In the late 1970s several countries, particularly the United States and the former USSR, began experiments with satellites which resulted in the COSPAS-SARSAT system being established well before implementation of the GMDSS. Since that time the system has provided a significant contribution to SAR operation and assisted in saving hundreds of lives.

In the later 1970s IMO in co-operation with IHO, established the world-wide navigation warning service(WWNWS) for the co-ordination and broadcast of navigational warnings to ships. Since 1929 Contracting Governments to the SOLAS Convention have undertaken to broadcast meteorological warnings and forecasts to ships and to make arrangements for the reception of danger warnings and meteorological reports, co-ordinated by WMO through its world weather watch (WWW), from ships. These matters together with broadcasts of SAR and other urgent information provide the maritime safety information (MSI) element of the GMDSS.

The GMDSS will be fully implemented in 1999 when, except possibly for a few remaining stations, use of Morse radiotelegraphy by ships will cease after 100 years of dedicated and faithful service.

Planning the GMDSS

Work on the new system started with the definition of the operational requirements that it should fulfil, which are as follows[12]:

"The system should be global and embody the most suitable communication techniques operating methods and shore-based facilities so that every ship, wherever it operates, will be able to perform those communication functions considered essential for the safety of the ship itself and for other ships in its vicinity"[13].

The communication functions include the ability for search and rescue (SAR) authorities ashore, as well as ships in the immediate vicinity of a vessel in distress, to be alerted rapidly to a distress incident so they can assist in a co-ordinated SAR operation with the minimum delay[14]. The functions also include the provision of facilities for urgency and safety communications and for the promulgation of maritime safety information, including navigational and meterological warnings.

The detailed work on the system design was carried out by the development of the following five major elements[15]:

- establishment of a communication network for the reception and transmission of distress alerts and distress and safety traffic;
- arrangements for the promulgation of maritime safety information;
- provision of regulations concerning the operation and implementation of the system[16];
- provision on ships of suitably trained operating personnel[17];
- provision on ships and at coast stations of suitable equipment.

To provide a means of managing the development of the system and for structuring the work, a flow diagram(figure 1) was constructed by connecting together the sequential events which each of the five major elements needed to pass through before the concept could be implemented fully and then interconnecting those flow lines on each occasion that an event in one was

likely to affect significantly the progress in another[18].

To understand the operation of the GMDSS, it is necessary to look in detail at some of these major elements.

The Concept of the GMDSS

The concept of the GMDSS is based on use of the most up-to-date radiocommunication technologies to provide a comprehensive distress and safety system of communication between ships and between ships and the shore and vice-versa wherever in the world the ships may be situated. The functional requirements of the GMDSS include transmitting and receiving ship-to-shore, and shore-to-ship distress alerts, ship-to-ship distress alerts, SAR Co-ordinating communications, on-scene communications, signals for locating, maritime safety information (MSI), general radiocommunications and bridge-to-bridge communications.

The following radiocommunication systems are used in the GMDSS:

1 the INMARSAT system using automatic calling, radiotelephone, direct-printing telegraphy, satellite EPIRBs and the Safety NET MSI service;

2 VHF, MF and HF terrestrial systems, using digital selective calling, radiotelephone, direct-printing radiotelegraphy and the NAVTEX and HF MSI services; and

3 the COSPAS-SARSAT system using the 406 MHz polar orbiting satellite EPIRB service.

The basic principle of the ship always being able to communicate with the shore from wherever it is situated in the world enabled an area of operation concept to be established for application of the GMDSS and for ships to fit, in addition to that necessary for ship-to- ship communications and reception of MSI, equipment necessary for communicating with those coast stations or coast earth stations, established by Administrations to meet GMDSS needs, which will be within range during the ships voyages[19]. The GMDSS Master Plan, being developed by IMO, divides the navigable waters of the world into:

- Sea Area A1—an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available;
- Sea Area A2—an area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available;
- Sea Area A3—an area, excluding sea areas A1 and A2, within the coverage of an INMARSAT geostationary satellite in which continuous alerting is available; and
- Sea Area A4—an area outside areas A1, A2 and A3.

It follows that, in some parts of the world where there is extensive coastal shipping, VHF and MF coast station networks will be established, in other parts, where establishment of VHF and MF networks is unnecessary or uneconomic, on leaving port ships, ships will immediately enter a sea area A3 or A4.

To achieve good commercial communications and ensure the efficient and economic operation of their ships, shipowners have generally fitted the best radiocommunication equipment on their ships and in doing so, have also improved the standards of distress and safety communications of their ships above the minimum standards of the SOLAS Convention[20]. The GMDSS will encour-

age shipowners to continue this practice, as its development has been paralleled by development of similar commercial communication systems by INMARSAT and CCIR, which provide unattended instant access to ships and form ships to the shore e.g. INMARSAT provides and extensive range of high quality and improved commercial services which are also finding favour in the aeronautical and land mobile services; digital selective calling and improved terrestrial services are also available for commercial use in accordance with the recommendations of CCIR.

The interference and congestion and possible delay in establishing contact on the old distress and calling frequencies should rarely occur in the GMDSS as all calling and communications are conducted on the dedicated VHF, MF, and HF distress and safety frequencies allocated by the ITU at WARC-MOB 87 and in the case of distress alert via the INMARSAT system, by priority access to the satellite[21].

The GMDSS also takes into account of the possibility of a ship suddenly sinking or the cause of the distress destroying the radio station and the need for a distress alert capability in such cases. This is provided by means of a satellite emergency position-indicating radio beacon (EPIRB) that is capable of floating free from the sinking ship and being automatically activated or being manually activated on board and transmitting the ships identity and either its position (INMARSAT) or a signal which provides the ships position(COSPAS-SARSAT)[22].

As the satellite EPIRB is portable and can be carried into survival craft and will provide a position accuracy better than 5 kms, survival craft in the GMDSS will be provided with portable VHF transceivers for on-aboard and on-scene communications and search and rescue radar transponders(SARTS) for final location by SAR units arriving at the distress position.

It is essential for safety that ships receive relevant navigational warnings, meteorological warnings and forecasts, SAR and other urgent information (MSI) for the part of the world in which they are situated. In the GMDSS this will be provided by automated unattended reception of printed MSI though, broadcasts in coastal waters, by the international NAVTEX service and elsewhere through the INMARSAT Safety NET service or by HF direct-printing telegraphy[23].

The GMDSS will use existing methods of direct-printing telegraphy and radiotelephony for communications which were in operation both terrestrially and via satellite before the GMDSS was developed. New equipment which had to be proved during development includes:

1 Digital selective calling equipment which complies with recommendations developed, following careful study and trials, by CCIR is a terrestrial system used for distress[24], safety and commercial calling. It is selective because messages can be sent to all stations, groups of stations (such as those in a particular area) or to a specific ship. A distress message can be sent to all stations simply by pressing a button;

2 Standard-C ship-earth stations (SES) which were developed by INMARSAT and CCIR and provide direct-printing telegraphy communications with the shore using simple relatively inexpensive equipment and an omnidirectional antenna. A distress priority message can be sent via CESs to the responsible RCCs ashore simply by pressing a button and individual, or groups of ships, may be called selectively;

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3 NAVTEX equipment which complies with CCIR recommendations and provides for the automatic reception by ships of scheduled MF narrow-band direct-printing broadcasts of MSI for the area in which the ship is situated;

4 INMARSAT Safety NET equipment which is an enhanced group call receiver developed by INMARSAT/CCIR for the reception of scheduled broadcasts of MSI to areas not covered by NAVTEX;

5 406 MHz satellite EPIRBs which are portable float-free devices developed to COSPAS－SARSAT specifications and CCIR recommendations and provide, when automatically or manually activated a distress alert and position via polar orbiting satellite and updated positions on each satellite pass[25];

6 1.6 MHz satellite EPIRBs which were developed form trials and studies conducted by CCIR in co-operation with INMARSAT and provide an instantaneous distress alert following automatic or manual activation; an additional device is necessary for up－dating position or location; and

7 Search and rescue radar·transponders(SARTs) which are used for location of the ship or survival craft by searching ships and aircraft when near the distress position. When the SART is interrogated by a searching unit's radar its unique signal is shown on the radar display giving the precise position of the ship or its survivors.

All GMDSS equipment is required to comply with IMO operational performance standards and the recommendations of CCIR and to be approved by administrations to ensure proper and safe operation.

To ensure equipment availability in the GMDSS, ships will use a combination of duplication of equipment[26] in accordance with the Draft Assembly resolution on radio maintenance for the GMDSS related to sea areas A3 and A4 (MSC 59/33, annex 10), shore based maintenance or at sea electronic maintenance capability.

The SOLAS regulations which resulted form the above concept are discussed in detail in a later lecture. However, they require equipment for different communication services, dependent upon the sea area in which ships trade. The equipment requirements for ships sailing in the various sea areas of operation can be summarized briefly, as follows;

- Sea area A1 ships will carry VHF equipment and either a satellite EPIRB or a VHF EPIRB;
- Sea area A2 ships will carry VHF and MF equipment and a satellite EPIRB;
- Sea area A3 ships will carry VHF, MF, a satellite EPIRB and either HF or satellite equipment;
- Sea area A4 ships will carry VHF, MF and HF equipment and a 406 MHz satellite EPIRB; and
- all ships will carry equipment for receiving broadcasts of MSI.

To ensure that the equipment is capable of operating properly, performance standards, based on the CCIR Recommendations, have been developed by IMO. These standards define the various

technical parameters necessary to enable the operational requirements to be met. Most administrations complement these standards by performance specifications which set out the methods by which the parameters should be tested and prescribe the required test results[27].

Time Frame for Installation of GMDSS Equipment on Ships

In considering an appropriate time frame for requiring GMDSS equipment to be fitted on ships subject to the 1974 SOLAS Convention, many factors were taken into account by the 1988 GMDSS Conference, including:

.1 the views of MOB-87, as expressed in resolution COM 5/1 of that Conference;

.2 the operational advantages to ships of being able to carry out certain of the new functions;

.3 the amortization of the costs of existing shipborne and shore-based equipment;

.4 the suitability of most modern equipment to meet the technical requirements and, hence, to operate satisfactorily in the GMDSS, provided additional facilities were provided;

.5 the probable production rate of new equipment;

.6 the probable time necessary for administrations to provide the necessary facilities on shore, including trained personnel;

.7 the time necessary to equip ships with GMDSS equipment; and

.8 sufficient time should be available to permit a smooth transition from existing arrangements.

As a result, the equipment fitting programme for every cargo ship of 300 gross tons and over and every passenger ship adopted by the 1988 GMDSS Conference is:

.1 all ships constructed after 1 February 1992 shall be fitted with a radar transponder and two-way VHF radiotelephone apparatus for survival craft;

.2 all ships to be fitted with a NAVTEX receiver and satellite EPIRB by 1 August 1993;

.3 all ships constructed before 1 February 1992 to be fitted with a radar transponder and two-way radiotelephone apparatus for survival craft by 1 February 1995[28];

.4 all ships constructed after 1 February 1995 to comply with all appropriate requirements for the GMDSS;

.5 all ships to be fitted with at least one radar capable of operating in the 9 GHz band by 1 February 1995;

.6 all ships to comply with the appropriate requirements for the GMDSS by 1 February 1999.

Ongoing Work on the GMDSS

In accordance with the recommendations of WARC-MOB 87, IMO is developing a GMDSS Master Plan of coast stations and coast earth stations provided by Governments, and co-ordinating schedules of broadcasts of MSI to avoid mutual interference in the NAVTEX, INMARSAT Safety NET and HF MSI systems. Details of the Master Plan will be given in a later lecture.

A WARC will be held in February 1992 to review articles N55 and N56 of the ITU Radio

Regulations and consider possible alignment of requirements with regulation IV/15 of the 1988 SOLAS Amendments[29].

Conclusion

International co-operation involving IMO, ITU, IHO, WMO, INMARSAT and the COSPAS－SARSAT partners, has resulted in the maritime community being provided with an integrated distress and safety communication system which should enhance significantly the safety of life and property in the harsh environment of the sea.

The contribution by the ITU was crucial to the development of the system. In particular the amendments made to the Radio Regulations by MOB-83 and MOB-87 provided the necessary frequencies and operating procedures for the system; and technical studies and tests carried out by CCIR Study Group 8 provided Recommendations which were used as the basis for the equipment performance standards as well as many of the radio services incorporated in the system.

New Words

paramount	adj	最高的，至上的	amend	vt	修正
amendment	n	修正	convene	vt	召开
Morse code	n	莫尔斯电码	attach(to)	vt	带有，附加
annex	vt&n	附录	nautical	adj	航海的
alert	vt&n	警戒	resolution	n	决议
concurrent	adj	一致的	advent	n	来到，来临
integration	n	完整，融合	terrestrial	adj	地面的，陆地的
implement	n	实现，履行	implement	vt&vi	实现，履行
meteorological	adj	气象，气象学的	forecast	vt&n	预报
embody	vt&vi	体现，使具体化	assert	vt	声明，宣称
promulgation	n	传播	sequential	adj	按时间或顺序的，连续的
interconnect	vt	使互相联系	comprehensive	adj	包罗广泛的，综合性的
coverage	n	覆盖	aeronautical	adj	航空的
in accordance to	prep	根据	interference	n	干扰
congestion	n	拥挤	activate	vt	触发，激活，启动
instantaneous	adj	瞬间发生的	interrogate	vt	触发
recommendation	n	建议	prescribe	vt	规定
amortization	n	过渡，分期偿还	alignment	n	调整，排列，合作，结盟
incorporated	adj	结合的，合并的			

Useful Expressions

The Global Maritime Distress and Safety System　全球海上遇险与安全系统

The 1906 International Radiotelegraph Convention　1906 年无线电规则

The distress and calling frequencies　遇险与呼叫频率

The International Convention for the Safety of Life at Sea (SOLAS)　国际海上人命安全公约

Ship Station 船站
Medium Frequency (MF) 中频
Very High Frequency(VHF) 甚高频
Gross Tonnage(G.T) 总吨位
World Administrative Conference (WARC) 世界无线电行政大会
International Telecommunication Union (ITU) 国际电信联盟
IMO—International Maritime Organization 国际海事组织
Narrow-Band Direct-Printing telegraphy 窄带直接印字电报
in the vicinity of 在……的附近
IRCC or CCIR—International Radio Consultative Committee 国际无线电咨询委员会
Take steps 采取步骤,采取措施
SAR—Search and Rescue 搜救
RCCs—Rescue Co-ordination Centers 营救协调中心
Equipment performance standards 设备性能标准
Radio Regulations 无线电规则
COSPAS-SARSAT 近极轨道搜救卫星系统
WMO—World Meteorological Organization 世界气象组织
WWW—World Weather Watch 世界气象观测
WWNWS—the World-Wide Navigation Warning Service 全球航行警告业务
contracting governments 缔约国政府
INMARSAT—International Maritime Satellite 国际海事卫星组织
MSI—Maritime Safety Information 海上安全信息
shore-based facilities 岸基设施
on-scene communications 现场通信
bridge-to-bridge 驾驶台对驾驶台
SAR Co-ordinating Communication 搜救协调通信
EPIRBs—Emergency Position Indicating Radio Beacons 应急无线电示位标
Safety NET—Safety Network 安全网
general communication 常规通信
distress incident 遇险突发事件
DSC—Digital Selective Calling 数字选择性呼叫
NAVTEX—Navigational Telex 航警电传接收机
406 MHz—406 Mega Hertz 406 兆赫兹
polar orbiting satellite 近极轨卫星
in addition to 除了……外,还有……
meet the needs of 满足……的要求
within range of 在……范围内
the GMDSS Master Plan GMDSS 培训计划
CES—Coast Earth Station 海岸地球站

in the case of　如果，以防万一
priority access to　优先接续到……
take into account of　考虑到……
survival craft　救生艇
SART—Search and Rescue Radar Transponder　搜救雷达应答器
SAR unit　搜救单元
comply with　遵守……，满足……
SES—Ship Earth Station　船舶地球站
omnidirectional antenna　全方向性天线
distress priority message　遇险优先等级信息
relating to　关于
dependent upon　根据，视……而定
set out　说明
be subject to　根据，符合……条件
IHO—International Hydrographic Organization　国际水道测量组织

Notes

1. 该句是强调句型。原句应为 Also in 1899, the first ship was fitted with radio.

2. "Titanic"：该船是当时世界上最大的，也是最豪华的游轮。该轮于 1912 年 4 月 4 日载着2 224名乘客从欧洲开往纽约。第二天午夜，它撞上冰山，它发出了遇险信号，尽管"加利福尼亚人"号轮离它只有 20 海里，由于报务员在睡觉，没有收到它的信号；又由于船上没有配备足够的救生艇，大约只有 700 人幸免于难。最后，该轮沉没。"泰坦尼克"号沉船事件是航海史上震惊世界的海难。

3. 该句话中 to review and amend the 1906 International Radiotelegraph Convention 为目的状语。which 从句做 convention 的定语从句。该句意思是：1912 年，在 1 500 人丧生于"泰坦尼克"号海难的三个月后为了修正 1906 年国际无线电报公约，国际无线电大会在伦敦召开。国际无线电公约规定了遇险和呼叫的频率……

4. 为了航行安全，对甚高频无线电话台站的有限要求包括在 1974 年的《国际海上人命安全公约》中，但是直到 1981 年，对所有采纳《国际海上人命安全公约》的船舶具备通过甚高频和中频无线电话进行通信的要求才能实现。

5. 该句话中，with 短语做定语，修饰 system。if time permitted 是独立主格，based on 短语做 system 的定语。该句意思是：具有要求的中频通信范围是 100～150 海里的现存莫尔斯码无线电报和无线电话系统，如果时间允许，提供了建立在警报遇险船舶附近船舶和覆盖范围之内海岸台站基础上的遇险系统。

6. CCIR preparing the technical bases of the system…in 1979. 该句 IMO 后省略了 preparing。which 从句做 convention 的非限定性定语从句。该句意思是：国际无线电咨询委员会准备该系统的技术基础，国际海事组织准备操作要求，成本效益分析及公约的草稿。该公约于 1977 年被采纳并促成国际海事卫星组织于 1979 年成立。

7. 该句中 however, attached at Annex, is an address…是个倒装句：on 短语做定语修饰 address，可译为国际海事卫星的工作是另一讲座的话题。然而，前国际海事组织秘书长 C. P.

Strivastava 先生在 1989 年国际海事卫星国际会议上所做的关于国际海事卫星的产生及在发展应予关心的全球海上遇险和求救系统的合作的演讲附在附录中。

8. 该句中的 VIII 为第八次大会，which 从句做了 document 的定语，that 从句做了 steps 的定语，to gradually improve 与 ultimately achieve 是并列关系，全名可译为：1973 年国际海事组织采纳了第八次大会制定的 A.273 号决议，它是关于发展海上遇险系统的政策性文件，它概述了逐渐改进现存系统并最终建成那时称遥远的未来系统即现在为人所知的全球海上遇险和求救系统所应采取的措施。

9. 即适应国际海事卫星公约的发展。

10. 由于中频和甚高频通信范围有限，为了使救助协调中心能够履行搜寻和救助公约中所规定的责任，超越中频范围的船舶都需具有长距离高频或卫星通信能力。

11. 该句中 IMO developing … standards, CCIR recommending … its use, the ITU 1983 WARC … to be used; the ITU WARC-MOB87 … the GMDSS; IMO adopting … on ships 为五个独立主格结构。全句含义是：发展全球海上遇险和求救系统需要国际电信联盟和国际海事组织的密切合作，国际海事组织发展操作要求及设备执行标准；国际无线电咨询委员会推荐设备技术规范和使用程序；国际电信联盟 1983 年的国际无线电管理委员会为测试系统并证明各种设备可以使用采纳了无线电规则中必要的条款；为了介绍全球海上遇险和求救系统，国际电信联盟世界无线电行政大会的 MOB-87 文件采纳了对无线电规则的必要的修正；为了在所有船上实施全球海上遇险和求救系统，国际海事组织在 1988 年采纳了对海上人命安全公约的修正。

12. 该句中 that it should fulfil 做 requirements 的定语。it 指 new system。which 从句是 requirements 的非限定性定语从句。其含义是：新系统的工作以对它应执行的操作要求进行阐明为开始，操作要求如下。

13. 系统应是全球的并且包括最合适的通信技术操作方法和岸基设施，以便无论在哪操作系统，每艘船都能执行那些被视为对船舶本身安全和附近的其他船舶很必要的通信功能。该句中 so that every ship … in its vicinity 做目的状语从句，其中 wherever it operates 做了地点状语从句：considered essential … vicinity 是过去分词短语做 functions 的定语。

14. "as well as" 词义同 "and"；alert somebody to something 使某人警觉某人。该句含义是：通信功能包括能够使岸上的搜救机构和离遇险船舶最近的船舶很快地警觉遇险事故，因此他们能在最短时间的延误内帮助协调搜救行动。

15. 系统设计的详细工作是通过发展如下五个主要组成部分来进行的。

16. concerning 该处系指 about，全句为：准备关于系统操作和实施的规定。

17. 为了句子的平衡，on ships 插到 provision 与 of 之间，应这样理解 provision of suitably trained operating personnel，即在船上配备适当的培训过的操作人员。

18. 该句中 connecting together … be implemented fully 与 then interconnecting … in another 是两个并列结构，即为了提供一种管理系统发展的方法并组织工作，通过先把 GMDSS 概念全面实施前，五个主要组成部分的每一个必须经过的事件按顺序连起来，然后把代表每一种情况的即在该种情况下其中的一件事件会严重地影响另一事件的进展的流程线相互连接起来，这样来构造一个流程方框图。

19. 该句中 equipment 做了 fit 的宾语；in addition to that 中的 that 代替 equipment；estab-

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