

GMDSS船员适任证书培训系列教材

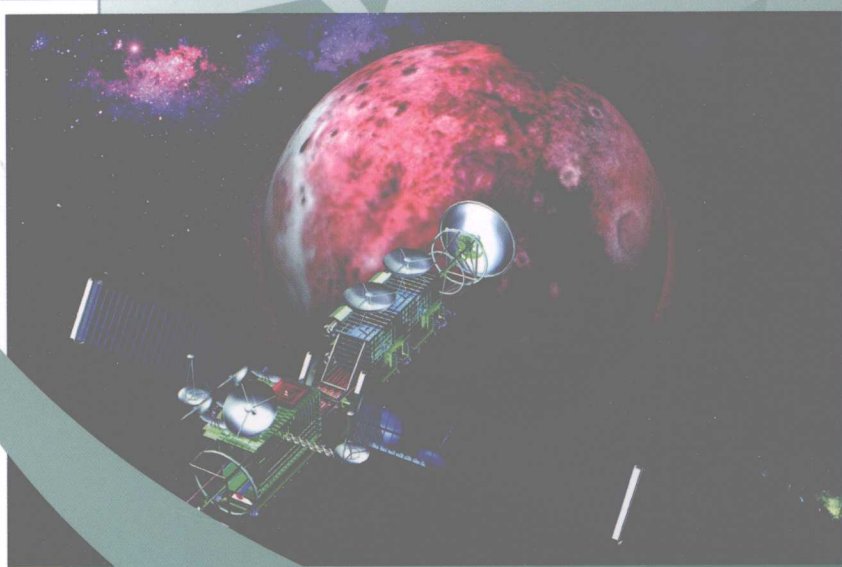
# GMDSS

## 通 信 英 语

主 编 李 军 李大泽

副主编 王晓娟 丁 峰

主 审 毛奇凰 陈 放



大连海事大学出版社

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# GMDSS 通信英语

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## 内容简介

本书共分5章:第一章为 GMDSS 英语阅读理解;第二章为 GMDSS 常用英文函电写作及翻译;第三章为英语听力,包括码语、标准航海英语和日常通信用语等内容的听写;第四章为 GMDSS 英语口语,包括码语、日常用语和无线电通信用语等;第五章为键盘打字,包括指法练习、GMDSS 专业词汇、语句、文章打字练习等内容。

本书比较全面系统地介绍了 GMDSS 各个分系统的组成及工作方式,对国际公约也作了必要的阐述,并结合新的“海船船员 GMDSS 适任证书考试大纲与评估规范”的要求,满足新大纲和评估规范对于“GMDSS 通信英语”知识的要求。在取材和编排上,力求理论联系实际,并编排大量例题和习题,所附光盘含全部听力材料,便于读者学习和教学使用。

本书可作为 GMDSS 适任证书培训专用教材,也可作为航海院校“GMDSS 通信英语”课程的教材,还可作为现职船舶驾驶员、航运公司管理人员和其他相关人员培训和业务学习的参考书。

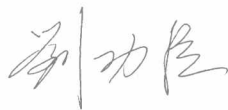
## 序

全球海上遇险与安全系统(GMDSS)是目前海上遇险、紧急、安全和常规通信的唯一通信系统,在保障航行安全方面起到非常重要的作用。多年来,我国的航海院校和船员培训机构培训了大批适任的 GMDSS 操作员,有力地保障了该系统在我国的顺利实施,对保障海上交通安全做出了积极的贡献。

近年来,随着航海技术的快速发展,新技术、新设备不断应用到 GMDSS 中。为确保 GMDSS 操作员能够胜任该系统的新要求,需要对现有的 GMDSS 考试大纲进行相应的调整。为此,中华人民共和国海事局组织有关专家对《GMDSS 考试大纲与评估规范》进行了修订。经修订的《GMDSS 考试大纲与评估规范》进一步明确了航海院校和船员培训机构开展 GMDSS 操作员培训的师资、设施和设备要求,提高了使用真实设备进行培训的要求,强化了对实际操作能力的考核要求。

为增强 GMDSS 培训的针对性和有效性,进一步提高培训质量,在深入研究、理解《GMDSS 考试大纲与评估规范》的基础上,由航海院校从事 GMDSS 的教学研究人员和海事管理机构长期从事 GMDSS 考试评估人员组成的教材编写组,历时两年编写了这套 GMDSS 船员适任证书培训系列教材。这套教材内容翔实,系统性强,既强调了 GMDSS 的基本理论,更重视 GMDSS 的实际操作能力,涵盖经修订的《GMDSS 考试大纲与评估规范》的全部要求,反映了新技术和新设备在 GMDSS 中的应用,全面系统地介绍了 GMDSS 及其发展状况。

我相信,这套教材的出版,对提高 GMDSS 培训质量和 GMDSS 操作员的综合素质将起到重要作用,是航海院校和船员培训机构开展 GMDSS 适任培训的优秀教材,同时也是航运业相关人员的有益参考书。



2008 年 7 月 20 日

# GMDSS 船员适任证书培训系列教材

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# 前 言

自 GMDSS 全面实施以来,海上通信发生了革命性的变化,船舶通信由过去的人工操作向自动化方向发展,船舶通信也变得像陆地一样方便和快捷。因此,船舶通信不再是需要专职人员经过长时间专门训练才能从事的一项工作。从 GMDSS 全面实施以来,大多数船公司、船东逐步取消了船舶专职的通信人员,由船舶驾驶员担任船舶的通信工作。船舶驾驶员经过一段时间的培训,取得了 GMDSS 通用操作员证书,基本可以承担船舶通信工作,但是船舶通信工作不仅局限于船舶的日常通信工作,而且还要应对各种安全检查,并且在紧急情况下还要迅速、可靠、灵活地利用最有效的通信手段完成船舶报警和通信工作,因此,培养兼任通信工作的驾驶人员的 GMDSS 英语综合应用能力,特别是听说能力是至关重要的。通过有针对性的学习与训练,能读懂 GMDSS 相关英文文章,并掌握其中心意思;能使用英语进行日常、无线电通信联络、遇险、紧急与安全通信;能基本完成水上移动业务电文等 GMDSS 相关写作任务;使船舶兼职通信人员更经济、更有效地完成船舶通信方面的各项工作。这就是本教材出版的目的。

本教材是根据中华人民共和国海事局海船船员《GMDSS 考试大纲与评估规范》的相关内容要求而编写的。

本教材共分五章,主要内容包括 GMDSS 英语阅读理解、GMDSS 常用英文函电写作及翻译、GMDSS 英语口语、英语听力和键盘打字五部分。

本教材由李军、李大泽任主编,王晓娟、丁峰任副主编,毛奇凰、陈放任主审;李军负责统稿并编写第一章第一、二、三、五节;李大泽编写第一章第七节,第八节的第 1、4、6、7 部分;王晓娟编写第一章第四、六、八节,第五章;丁峰编写第二章;张颖编写第三章;杨华编写第四章和附录三。

本教材可作为航海院校“GMDSS 通信英语”课程的教材,也可作为现职船舶驾驶员、航运公司管理人员以及其他相关人员培训和业务学习的参考用书。

本教材在编写过程中,青岛远洋船员学院信息工程系及通信、电子工程教研室全体教师为教材的编写提出许多宝贵的意见和建议,在此表示衷心的感谢。

教材的出版得到中华人民共和国海事局、山东海事局、航海院校专家和大连海事大学出版社的积极支持,在此一并表示感谢。

由于编者水平有限,书中难免存在错误和不妥之处,敬请读者,特别是使用本书的教师和学生积极指出批评和改进意见,以便今后不断改进。您的意见和建议请发至以下 E-mail:

hhuiliu@qingdaonews.com

编 者  
2008 年 7 月

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# CHAPTER 1 GMDSS READING COMPREHENSION

## 1.1 INTRODUCTION

### 1.1.1 *Basic Concept of the GMDSS*

#### **The GMDSS**

The new system is called the Global Maritime Distress and Safety System (GMDSS). It was adopted by the IMO in 1988 and replaces the 500 kHz Morse code system. The GMDSS is automated and uses ship-to-shore alerting by means of satellite radio in addition to terrestrial radio. The GMDSS applies to all cargo ships of 300 gross tons and above on international voyages, and to all passenger ships, regardless of size, on international voyages.

#### **Implementation**

The GMDSS requirements for radio communications are contained in Chapter IV of SOLAS. There was a transition period from the old to the new system in order to allow time to overcome any unforeseen problems in implementation of the new system. The transition period began on 1 February 1992 and continued to 1 February 1999.

The GMDSS has eliminated compulsory aural radio watch keeping on 2182 kHz. However an aural watch on VHF CH16 by SOLAS ships will remain for the foreseeable future with a view to provide:

- (1) a distress alerting and communication channel for non-SOLAS vessels; and
- (2) bridge-to-bridge communications for SOLAS ships.

#### **Basic Concept of the GMDSS**

Prior to the introduction of the GMDSS, maritime distress and safety communications relied primarily on the capability of a vessel in distress to alert another vessel for assistance. The GMDSS emphasizes the ability to alert search and rescue (SAR) authorities ashore as well as shipping in the vicinity in order to achieve a rapid, coordinated response to distress situations. The shore-based rescue authorities now have the primary role of coordinating assistance and rescue operation following a distress alert. In the past, assistance was possible only if vessels capable of receiving the distress alert were within radio range. The danger was that calls for assistance would go unheard in remote areas.

In the GMDSS, the initial acknowledgement of a DSC distress alert should be by a shore station. Ships should acknowledge receipt of a distress message by voice or telex on the follow-up frequency. Subsequent actions and communications should be controlled by the assigned Rescue

Coordination Centre (RCC). In normal circumstances it should not be necessary for a vessel to relay a distress alert. In order to avoid confusion and delay, vessels must monitor the distress frequency to be certain that the original alert was not received before initiating a distress relay. Particular care is needed when a distress alert is received on HF at a considerable distance from the incident to avoid making unnecessary or confusing transmissions in response. The method of distress alerting can depend on the sea area in which the vessel is sailing and on the equipment carried.

### Navigational sea areas

The GMDSS is based on the concept of using four marine communication sea areas to determine the operational maintenance and personnel requirements for maritime radio communications, viz:

**Sea Area A1** Within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available. Such an area could extend typically 20 - 50 nautical miles from the coast station.

**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. For planning purposes this area typically extends to up to 150 nautical miles offshore, but would exclude any A1 designated areas, in practice, satisfactory coverage may often be achieved to around 250 nautical miles offshore.

**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. This area lies between about latitudes 70° North and South, but excludes A1 and/or A2 designated areas.

**Sea Area A4** An area outside sea areas A1, A2 and A3. This is essentially the polar regions, north and south of about 70° of latitude, but excludes any other areas.

The worldwide communication coverage of the GMDSS is achieved by a combination of satellite (Inmarsat) and terrestrial systems. Based on the range limitations of each system, the four sea areas have been defined according to the coverage of VHF, MF, HF Coast Radio Services and Inmarsat services. The type of radio equipment required to be carried by a vessel is therefore determined by its area of operations.

The GMDSS will enable a ship in distress to send a message in various ways and be virtually certain that it will be heard and acted upon. The distress or safety message will be picked up by ships in the area and by shore stations within range (as in the present system), if sent on MF and VHF, or shore stations if transmitted using HF, Inmarsat or the COSPAS-SARSAT system.

### New Words and Phases

auspices *n.* 主办, 赞助

acknowledgement *n.* 承认, 应答

predecessor *n.* 前辈, 前身

compulsory *a.* 强迫的, 强制的

terrestrial *a.* 地面的

aural *a.* 耳的, 听觉的

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

IMO (International Maritime Organization) 国际海事组织

**Questions:**

1. Which of the following statements is correct according to this passage?
  - A. Sea Area A1 is within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available.
  - B. Sea Area A2 is within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available.
  - C. Sea Area A3 is within the coverage of an Inmarsat geostationary satellite in which continuous alerting is available.
  - D. Both A and B.
2. The type of radio equipment carried by a SOLAS vessel is determined by:
  - A. The area it operates.
  - B. The size of the vessel.
  - C. The type of the vessel.
  - D. None of above.
3. How does the GMDSS enable a ship in distress to send a message?
  - A. in many ways
  - B. in a way
  - C. only by DSC
  - D. only by Inmarsat
4. Which of the following statements is correct according to this passage?
  - A. The new GMDSS was carried out on 1 February 1992.
  - B. The new GMDSS was carried out on 1 February 1999.
  - C. The transition period from the old to the new system began on 1 February 1992 and continued to 1 February 1999.
  - D. None of above.

### 1.1.2 *Sub-systems*

An essential feature of the GMDSS is that radio watch keeping is automatic, so that when the receiving equipment is activated, an operator is alerted. Subsequent distress and safety communications are carried out on radiotelephone or radiotelex.

On board the vessel, when communications are not in progress, radio operators (usually the bridge watchkeeping officers) are required to monitor just two essential conditions:

- a) that the equipment is in service and fully operational, and
- b) that the equipment is correctly set up to perform all the mandatory GMDSS functions; this is done by carrying out regular tests according to the relevant regulations.

The GMDSS is composed of several "sub-systems" which are co-ordinated through shore-based authorities to provide all the required functions needed to ensure safety at sea.

The main sub-systems can be grouped as follows:

#### (1) The Digital Selective Calling (DSC) Terrestrial Calling System

This is an automatic calling system which makes the initial contact between two stations (or groups of stations or stations in a selected area). The caller composes a short message which is transmitted directly to the receiving station (or stations). Dedicated radio frequencies have been allocated for this purpose in the VHF, MF and HF bands for short, medium and long ranges respectively.

The received information is displayed on a screen and an alarm is sounded, in rather a similar way as an SMS message is received by mobile telephones. The received information indicates the purpose of the call and directs the operator to a radiotelephone or radiotelex channel for subsequent communications.

If the caller is in distress, the ship's name, position and nature of distress are included in the DSC message. For distress and urgency alerts, the alarm sounds continuously until the received information has been read by the operator. DSC distress alerts received by shore stations may be automatically and immediately routed to the nearest Rescue Co-ordination Centre (RCC).

#### (2) The Satellite Communication System

Satellite networks are capable of providing a full range of communication services encompassing all general communications requirements, as well as distress and safety functions, within the network coverage area. At present, Inmarsat (a fully commercial, non-government, company) is the only provider of GMDSS maritime communication services by satellite, but others may provide such services later, subject to authorization by IMO. Inmarsat coverage is between 70°N and 70°S.

#### (3) The Maritime Safety Information (MSI) System

MSI includes navigational and meteorological warnings, meteorological forecasts, and other urgent or safety-related messages of importance to all vessels at sea and may also include electronic chart correction data. Broadcasts are by MF telex (known as NAVTEX) for local MSI, and by Inmarsat-C or HF telex for long-range MSI (i. e., Navarea warnings, etc.).

#### (4) The EPIRB (Emergency Position Indicating Radio Beacon) System

EPIRB alerting via satellite is available through Inmarsat and Cospas-Sarsat. The Inmarsat system provides coverage between 70°N and 70°S via 4 geostationary satellites. The EPIRB's position is transmitted after being entered into the EPIRB either manually or by GPS. Inmarsat EPIRBs operate at L-band (1.6 GHz).

The Cospas-Sarsat system provides full global coverage via both polar orbiting and geostationary satellites. The EPIRB's position can be determined by Doppler method (which does not require position input at the EPIRB) or by having the position entered manually or by GPS. Cospas-Sarsat EPIRBs operate on 406 MHz and include a 121.5 MHz signal to provide a homing signal for searching aircraft.

The carriage requirements for satellite EPIRBs came into effect on 1 August 1993, and is mandatory for all vessels subject to SOLAS.

### Detection of erroneous activation of EPIRBs:

EPIRBs are usually mounted in exposed locations, so that they can float free of obstruction if a vessel founders. They are not normally visible from the bridge, so if an EPIRB is dislodged, or falls into the sea, it sends its distress message without those on board being aware that it has done so. Under some circumstances this can also occur when the EPIRB is removed for routine maintenance checks and battery replacement.

The false activation of a 406 MHz EPIRB which is not immediately detected onboard, will result in RCCs attempting to contact the ship. If activation is not established very quickly, full SAR procedures can often be initiated. This can place a heavy burden on people in SAR organizations, including volunteers. Moreover, there is a chance that a false distress alert will coincide with an actual distress situation, resulting in SAR resources being delayed in responding to a real distress. It can result in ships being diverted, and may involve helicopters or long distance flights by fixed-wing aircraft if the position indicated is in mid-ocean.

#### (5) The SART (Search And Rescue Transponder) System

The SART is a portable radar transceiver, primarily intended to be deployed on survival craft. When it receives a 9 GHz (3cm) radar signal (ie. from a searching radar), it switches on its transmitter and broadcasts its own special signal. This is seen as a series of 12 dots on all radar screens within range. The dot nearest to the screen centre is the SART's location. Aircraft are sometimes fitted with 9 GHz marine radar for marine SAR operations.

A full understanding of each of the above sub-systems is essential to all operators and service technicians, whether ashore or afloat.

### New Words and Phases

initiate	v. 开始, 发动	divert	v. 转移, 转向
encompassing	n. 包含, 围绕	coincide	n. 一致, 巧合

MSI (Maritime Safety Information) 海上安全信息

SART (Search And Rescue Radar Transponder) 搜救雷达应答器

EPIRB (Emergency Position Indicating Radio Beacon) 紧急无线电示位标

DSC (Digital Selective Calling) 数字选择性呼叫系统

#### Questions:

1. In the Cospas-Sarsat system, the EPIRB's position can be determined by:
  - A. Doppler method.
  - B. GPS.
  - C. being entered manually.
  - D. none of the above.
2. Which of the following statements is true according to this passage?
  - A. The false activation of a 406 MHz EPIRB will result in RCCs attempting to contact the ship.
  - B. The false activation of a 406 MHz EPIRB may be resulting in SAR resources being

delayed in responding to a real distress.

- C. The false activation of a 406 MHz EPIRB can result in ships being diverted, and may involve helicopters or long distance flights by fixed-wing aircraft if the position indicated is in mid-ocean.
  - D. all of above.
3. In the DSC system, if the caller is in distress, which one is not included in the message?
- A. the name of the ship.
  - B. the call sign of the ship.
  - C. the position of the ship.
  - D. the nature of distress.
4. Which system can broadcast the MSI?
- A. NAVTEX
  - B. Inmarsat-C
  - C. HF telex
  - D. all of above

### 1.1.3 Functional Requirements

The GMDSS is a largely, but not fully, automated system which requires vessels to have a range of equipment capable of performing the nine radiocommunication functions of the GMDSS, viz:

(1) Transmission of ship-to-shore distress alerts by at least two separate and independent means, each using a different radio communication service

Details for each individual vessel are to be found on its Safety Radio Certificate. On a Sea Area A1 vessel, for example (which always remains within DSC range of a shore VHF station) the primary means would be the VHF DSC, and the secondary means could be an EPIRB. In the case of a Sea Area A4 ship, the primary means would have to be HF DSC and the secondary means a 406 MHz EPIRB.

(2) Reception of shore-to-ship distress alerts

If, for example, a vessel sends a distress signal via an EPIRB or Inmarsat-C satellite terminal, other vessels which might be in the vicinity will not become aware of the distress until the shore authorities relay the distress details by directing a DSC distress relay call and/or a satellite call to all vessels within an appropriate Geographical Area.

(3) Transmission and reception of ship-to-ship distress alerts

A vessel in distress can alert other vessels in the vicinity by sending a DSC distress alert on VHF and MF, simultaneously if desired, and follow it up with a distress (MAYDAY) voice message on CH16 or 2182 kHz. Note that HF DSC is for long-range work and is intended primarily for alerting the shore-based authorities, especially if there are no vessels in the vicinity.

(4) Transmission and reception of search and rescue co-ordinating communications

This means that vessels must be able to perform the functions described in the IAMSAR Manual. For suitably equipped vessels, this might include the use of radiotelex (more properly



called Narrow-Band Direct-Printing - NBDP) between the vessels involved in a search.

(5) Transmission and reception of on-scene communications

“On-scene communications” are short to medium range communications carried out during the course of a search and rescue operation. For this purpose, vessels must be able to communicate with aircraft, as well as with other vessels and the shore, using the dedicated GMDSS frequencies for voice and NBDP distress communications.

The “on-scene” frequencies for radiotelephone are:

VHF (F3E) CH16 (distress & safety communications) and CH06 (intership and ship-aircraft communications)

VHF (A3E) 121.5 & 123.1 MHz (ship-aircraft communications - compulsory for passenger vessels)

MF (J3E) 2182 kHz (distress & safety communications)

HF (J3E) 3023 kHz (ship-aircraft), 4125 kHz (ship-shore, ship-ship) and 5680 kHz (ship-aircraft)

To avoid confusion and unnecessary interventions, any DSC transmissions on MF or HF related to distress incidents, and intended to be received by other ships in general, should be addressed precisely to the geographical area involved.

(6) Transmission and reception of signals for locating

Locating and homing signals in the GMDSS are provided by radar beacons (SARTs) and EPIRBs as described above.

(7) Transmission and reception of Maritime Safety Information (MSI)

The GMDSS supports three independent systems for broadcasting MSI to ships, viz: (1) NAVTEX on MF for coastal areas, (2) SafetyNET via Inmarsat-C for long-range purposes and (3) HF telex. MSI for coastal areas not covered by NAVTEX are broadcast via SafetyNET and/or HF telex.

(8) Transmission and reception of general radiocommunications to and from shore-based radio systems or networks

The GMDSS provides facilities for all types of commercial and personal communications. GMDSS radio operators need to know how to make telephone and telex calls to shipping agents, port authorities, the public telephone network etc. through commercial telecommunication networks.

(9) Transmission and reception of bridge-to-bridge communications

This refers to the SOLAS requirement that access to VHF communication equipment must be available from the position at which the vessel is normally navigated. The equipment must include operation on CH13, the frequency reserved for intership communications relating to the Safety of Navigation.

## *New Words and Phases*

NBDP (Narrow-Band Direct-Printing) 窄带直接印字报

HF (High Frequency) 高频

IAMSAR (International Aeronautical and Maritime Search And Rescue Manual) 国际海空搜