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COMSAR.1/Circ.33/Rev.1  
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## **GMDSS COAST STATION OPERATOR'S CERTIFICATE (CSOC) SYLLABUS**

1 The Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), at its ninth session (21 to 30 June 2022), noted the amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974 adopted by the Maritime Safety Committee, at its 105th session (20 to 29 April 2022), by resolution MSC.496(105).

2 Subsequently, the Sub-Committee finalized the revision of the GMDSS Coast Station Operator's Certificate (CSOC) syllabus to ensure that staff on duty in rescue coordination centres (RCCs) and in GMDSS shore-based facilities for the mobile satellite service and maritime mobile service are adequately qualified and trained to operate the stations effectively in accordance with the SOLAS Convention. This syllabus is not intended for engineers, technicians and operators of a recognized mobile satellite service network. The syllabus may be adapted to different shore-based facilities for radiocommunications, as appropriate, in particular, for operators in coast stations using only one frequency band of the maritime mobile service for a dedicated purpose.

3 The Sub-Committee agreed that this syllabus should be made available to elaborate IMO model courses in conformity to the *Revised guidelines for the development, review and validation of model courses* (MSC-MEPC.2/Circ.15/Rev.1).

4 The Sub-Committee also agreed that, pending validation and in view of an urgent need for immediate provision of training to operators at GMDSS shore-based facilities for the mobile satellite service and maritime mobile service, and RCCs, the syllabus set out in the annexes to the current circular should be made available to Member States as soon as possible.

5 Member States are invited to bring this circular to the attention of all parties concerned and use the syllabus in the interim to train operators at GMDSS shore-based facilities for the mobile satellite service and maritime mobile service, and RCCs until IMO model courses have been finalized and validated.

6 This circular revokes COMSAR.1/Circ.33.

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## ANNEX 1

### GMDSS (CSOC) SYLLABUS AIMS AND OBJECTIVES

#### 1 AIMS

1.1 The Global Maritime Distress and Safety System (GMDSS) syllabus is designed to prepare a course to revise well-known radiocommunication practices and to enhance procedures within rescue coordination centres (RCCs) and GMDSS shore-based facilities for the mobile satellite service and maritime mobile service.

1.2 It will raise awareness of the GMDSS and its procedures among operators of RCCs and GMDSS shore-based facilities for the mobile satellite service and maritime mobile service, and promote best practices and efficient use of radiocommunication equipment.

1.3 The syllabus will aim to achieve standards common to those required of professional mariners (GMDSS General Operator's Certificate) and, as such, promote the certification of operators at RCCs and GMDSS shore-based facilities for the mobile satellite service and maritime mobile service.

1.4 The syllabus may be adapted to different shore-based facilities for radiocommunications, as appropriate, in particular for operators in coast stations using only one frequency band of the maritime mobile service for a dedicated purpose.

#### 2 OBJECTIVES

By the end of the course based on this syllabus, the participant will have:

- .1 understood all Routine, Distress, Urgency and Safety radiotelephony (RTP) procedures to a common standard of expertise;
- .2 a comprehensive knowledge of the GMDSS, including all component parts and procedures;
- .3 considered all the implications of the GMDSS for the search planner and how to apply the knowledge to real-life situations;
- .4 consolidated knowledge and expertise in the use of all communication equipment utilized by RCCs and GMDSS shore-based facilities for the mobile satellite service and maritime mobile service; and
- .5 his/her knowledge and competence measured by a series of three examinations which be at least equivalent to the standards set by the GMDSS General Operator's Certificate.

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## ANNEX 2

### SYLLABUS ITEMS

#### **SECTION 1 – GMDSS overview**

- 1.1 Origins and implementation
- 1.2 Objectives, concept and functions of the GMDSS
- 1.3 Application
- 1.4 Sea areas defined
- 1.5 General equipment types
- 1.6 Equipment requirements by sea area

#### **SECTION 2 – Radio wave characteristics and propagation**

- 2.1 Concept of radio frequency, wavelength and velocity
- 2.2 Relationship between wavelength and aerial height/length
- 2.3 Units of radio frequency and the frequency spectrum
- 2.4 Propagation mechanisms
- 2.5 Types of modulation
- 2.6 Classes of emission
- 2.7 Simplex and duplex

#### **SECTION 3 – Types of station in the mobile service**

- 3.1 Maritime mobile service
- 3.2 Aeronautical mobile service
- 3.3 Land mobile service

#### **SECTION 4 – Digital selective calling**

- 4.1 General overview
- 4.2 DSC frequencies
- 4.3 National DSC coast station arrangements
- 4.4 DSC action by ships and CRSS
- 4.5 Overview of HF DSC

#### **SECTION 5 – RTP communications**

- 5.1 Distress
- 5.2 Urgency
- 5.3 Small craft safety information (SCSI) broadcasts where applicable
- 5.4 Safety
- 5.5 Routine communications and ITU Radio Regulations
- 5.6 RTP communications integrity

#### **SECTION 6 – SATCOMS/Recognized mobile satellite services**

- 6.1 General overview
- 6.2 Component parts of the systems
- 6.3 Variety of communications
- 6.4 System equipment
- 6.5 Enhanced group call (EGC)

#### **SECTION 7 – NAVTEX services**

- 7.1 General overview
- 7.2 Ship equipment and message priorities
- 7.3 Message categories
- 7.4 National NAVTEX system

## **SECTION 8 – EPIRBs**

- 8.1 General overview
- 8.2 The COSPAS-SARSAT system
- 8.3 Approved EPIRBs and EPIRB databases

## **SECTION 9 – Emergency portable VHF radios**

- 9.1 General requirements
- 9.2 Mandatory channels

## **SECTION 10 – Devices for locating**

- 10.1 General overview
- 10.2 Positioning aboard ship
- 10.3 Technical specification
- 10.4 Range of signals for locating

## **SECTION 11 – Concept of RCC and SAR operations**

- 11.1 Equipment types
- 11.2 Workstations
- 11.3 Log keeping
- 11.4 Publications
- 11.5 Codes, signals and standard phrases
- 11.6 Communications for SAR operations
- 11.7 Authority and responsibility for communications by national RCCs, CRSs and GMDSS shore-based facilities
- 11.8 Advice to the public on efficient radio procedure and use of radiocommunication equipment
- 11.9 Equipment user manuals and guides
- 11.10 Equipment power delivery

## **SECTION 12 – Implications of the GMDSS for RCCs**

- 12.1 Distress alerts
- 12.2 False alerts
- 12.3 Interference problems
- 12.4 Information gathering
- 12.5 Search planning
- 12.6 Effort allocation
- 12.7 Search instructions
- 12.8 Probability of detection (PoD)
- 12.9 Decoding MMSIs, serial numbers and alert messages, and databases

## **SECTION 13 – Practical use of RCC and GMDSS shore-based facility communication equipment**

- 13.1 Communication equipment
- 13.2 Other types of SATCOMS message broadcast
- 13.3 Testing and maintenance of GMDSS equipment

## **SECTION 14 – Telephone, fax and RTP calls to ships**

- 14.1 Methods of making calls
- 14.2 Methods of charging calls

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## ANNEX 3

### DETAILED SYLLABUS AIMS AND OBJECTIVES

**NOTE:** *It is recommended that the syllabus objectives highlighted in bold italics may not be required if an individual has previously qualified in the GMDSS General Operator's Certificate. The syllabus should be adapted to different GMDSS shore-based facilities for radiocommunications, in particular for operators in coast stations using only one frequency band of the maritime mobile service for a dedicated purpose.*

#### SECTION 1 – GMDSS overview

##### 1.1 Origins and implementation

**Aim:** *To ensure that participants gain knowledge of how the GMDSS was developed and an overview of previous legislation governing maritime communications.*

**Objectives:** By the end of the session the participant will be able to:

***state correctly from memory the organizations responsible for the administration of the GMDSS, both international and domestic;***

***state correctly from memory the international agreement which enables the GMDSS and the domestic legislation which has ratified the system within national legislation;***

***state correctly from memory, three out of four types of equipment on which communication legislation prior to the GMDSS was based; and***

***discuss accurately from memory four relevant advantages of GMDSS communication regulations.***

##### 1.2 Objectives, concept and functions of the GMDSS

**Aim:** *To consider and discuss the objectives, concept, and functions of the GMDSS.*

**Objectives:** By the end of the session the participant will be able to:

***state correctly from memory two out of three main objectives desired of the GMDSS; and***

***list correctly, with the aid of a mnemonic if necessary, all nine functions of the GMDSS.***

##### 1.3 Application

**Aim:** *To consider what ships must comply with the GMDSS regulations and what provisions exist for exemption from compliance.*

**Objectives:** By the end of the session the participant will be able to:

***decide correctly from memory on every occasion, given the size, type, nature of passage and means of propulsion of any ship, whether that ship must comply with the GMDSS provisions or not; and***

***list correctly from memory exemptions from the GMDSS provisions.***

#### **1.4 Sea areas defined**

***Aim:*** To examine the designation of sea areas as laid down in the GMDSS provisions compared both to the world's coastline and to the declarations of particular Governments.

**Objectives:** By the end of the session the participant will be able to:

***Define correctly on every occasion from memory the four sea area designations under the GMDSS regulations;***

***decide correctly on every occasion from memory which GMDSS sea area a position would relate to;***

***state correctly from memory how to validate the answers above in terms of declarations by a particular government; and***

***state correctly from memory which sea area(s) are within own SRR.***

#### **1.5 General equipment types**

***Aim:*** To develop an overview of the types of shipborne equipment and communication systems which make up the GMDSS.

**Objective:** By the end of the session the participant will be able to list from memory nine systems of communication equipment which contribute to the GMDSS.

#### **1.6 Equipment requirements by sea area**

***Aim:*** To develop an understanding of the GMDSS requirements for shipborne equipment dependent upon sea area of navigation.

**Objective:** By the end of the session the participant will be able to correctly list from memory:

***all types of communication equipment which must be carried by a ship navigating within sea area A1;***

***all types of communication equipment which must be carried by a ship navigating within sea area A2;***

***all types of communication equipment which must be carried by a ship navigating within sea area A3; and***

***all types of communication equipment which must be carried by a ship navigating within sea area A4.***



## **SECTION 2 – Radio wave characteristics and propagation**

### **2.1 Concept of radio frequency, wavelength and velocity**

***Aims:** To explore the basic physical science which underpins the theory of radio waves and propagation.*

**Objectives:** By the end of the session the participant will be able to:

***discuss accurately with the aid of a handout, the concepts of radio wavelength, frequency and velocity; and***

***state correctly from memory the relationship between radio wavelength, frequency and velocity.***

### **2.2 Relationship between wavelength and aerial height/length**

***Aims:** To give the participant a basic rule of thumb in understanding how the wavelength of radio signals affects the optimum length of aerial.*

**Objectives:** By the end of the session the participant will be able to **state correctly from memory a rule of thumb calculation which can determine the optimum antenna length required for a given radio wavelength.**

### **2.3 Units of radio frequency and the frequency spectrum**

***Aims:** To introduce the participant to the International System of Units (SI units) used to measure radio frequency, wavelength and velocity and the correct means of labelling such values.*

**Objectives:** By the end of the session the participant will be able to:

***quote correctly from memory the SI units used to measure velocity, frequency and wavelength;***

***state correctly from memory the three standard multiples of the basic unit of frequency and the correct labelling for each;***

***state correctly from memory on every occasion, in which part of the frequency spectrum a given radio frequency lies;***

***state correctly from memory the exact frequency band appropriate to VHF maritime radiocommunications; and***

***discuss accurately with the aid of a handout a practical use for each of the radio bands.***

### **2.4 Propagation mechanisms**

***Aims:** To examine the means by which radio waves travel in still air.*

**Objectives:** By the end of the session the participant will be able to:

***discuss accurately with the aid of a handout the physical form of radio waves;***

***list correctly from memory, three ways in which radio waves are affected by the atmosphere;***

***discuss accurately with the aid of a handout, the three layers of atmosphere which affect radio wave propagation;***

***list correctly from memory the four types of radio propagation wave and be able to discuss accurately from memory characteristics of each;***

***state correctly with the aid of a handout, the meaning of the terms "skip zone" and "skip distance";***

***discuss accurately with the aid of a handout, the meaning of the term "fading" of radio reception;***

***state correctly from memory how to calculate the theoretical radio horizon for any particular antenna;***

***list correctly from memory three properties which will affect the propagation of radio waves over a long distance; and***

***discuss accurately from memory three properties which will affect the propagation of VHF radio waves.***

## **2.5 Types of modulation**

***Aims:*** To introduce the participant to the concepts of amplitude and frequency modulation, carrier and bandwidth.

**Objectives:** By the end of the session the participant will be able to:

***discuss accurately from memory the meaning of the term "modulation";***

***state correctly from memory the two main forms of modulation used in radiotelephony (RTP) communications and state correctly which applies to VHF radio and which to MF radio;***

***discuss accurately with the aid of a handout, the characteristics of amplitude modulation;***

***discuss accurately with the aid of a handout, the characteristics of frequency modulation; and***

***discuss accurately with the aid of a handout, the terms "bandwidth" and "carrier frequency".***

## **2.6 Classes of emission**

***Aims:*** To introduce the participant to the ITU classifications of emission and examine those of particular relevance to maritime RTP communications.

**Objectives:** By the end of the session the participant will be able to:

***discuss accurately with the aid of a handout, the method of designating class of emission used by the ITU;***

***state correctly from memory the three-letter acronym designating the class of emission used with 2 182 kHz distress communication channel and discuss the meaning accurately from memory;***

***state correctly from memory the three-letter acronym designating the class of emission for use with MF band working frequencies and discuss the meaning accurately from memory; and***

***state correctly from memory the three-letter acronym designating the class of emission for use in VHF RTP communications and discuss the meaning accurately from memory.***

## **2.7 Simplex and duplex**

***Aims:*** To introduce the participant to the basic concept of simplex and duplex RTP communications.

**Objectives:** By the end of the session the participant will be able to:

***discuss accurately from memory the characteristics of simplex communications; and***

***discuss accurately from memory the characteristics of duplex communications.***

## **SECTION 3 – Types of station in the mobile service**

### **3.1 Maritime mobile service**

***Aims:*** To determine working definitions for different types of operating stations within the maritime communication system.

**Objectives:** By the end of the session the participants will be able to:

***define accurately from memory the terms "station", "ship" and "traffic" as they are applied to maritime communications;***

***list correctly from memory five out of six stations with which a ship is permitted to communicate directly by RTP;***

***list correctly from memory two facilities provided by a CRS; and***

***list correctly with the aid of a handout, the three methods by which a ship can achieve commercial communications via a CRS.***

### **3.2 Aeronautical mobile service**

***Aims:*** To determine working definitions for different types of operating stations within the aeronautical communication system.

**Objectives:** By the end of the session the participants will be able to:

***understand the different frequency bands used for aircraft;***

***define accurately from memory the frequencies for communication with aircraft on VHF, MF and HF bands; and***

***identify and use aircraft's call signs in Search and Rescue (SAR) operations.***

### **3.3 Land mobile service**

***Aims:*** To determine working definitions for different types of operating stations within the land communication system.

**Objectives:** By the end of the session the participants will be able to:

***understand the different frequency bands and systems used for land mobile service; and***

***define accurately from memory frequencies and systems for communication with land mobiles.***

## **SECTION 4 – Digital selective calling**

### **4.1 General overview**

***Aims:*** To explore fully the characteristics and principles of the Digital Selective Calling (DSC) system.

**Objectives:** By the end of the session the participant will be able to:

***list correctly from memory, in which sea areas DSC is relevant;***

***describe accurately with the aid of a handout, basic technical details of the DSC system, including the duration of a DSC alert on MF and VHF;***

***state accurately from memory, the term used to describe the error check function of the DSC system and with the aid of a handout, discuss how this works;***

***describe accurately from memory, the number and frequency of distress alerts transmitted by ships' equipment;***

***state correctly from memory, the options available when addressing a DSC message;***

***discuss accurately from memory, a potential difficulty in terms of the range of communications when operating DSC equipment and the subsequent analogue RTP equipment;***

***discuss accurately from memory the meaning of the terms "designated" and "undesignated" DSC distress alerts;***

***demonstrate from memory, correct analysis of a DSC distress alert message on 15 out of 18 occasions;***

***discuss accurately from memory, how position information can be derived for DSC systems, and the implications this may have for search area determination;***

***distinguish accurately from memory, on every occasion, between MMSIs for ship stations, shore stations and groups of ship stations; and***

***state correctly from memory, the three sources of information to enable the decoding of MMSIs.***

#### **4.2 DSC frequencies**

***Aims:*** To determine the DSC frequencies used in the VHF, HF and MF bands, and the procedure for subsequent RTP communications.

**Objectives:** By the end of the session the participant will be able to:

***list accurately from memory, the frequency of MF DSC, the channel appropriate for VHF DSC, and in each case the associated RTP frequency and channel; and***

***list accurately with the aid of a handout, the five frequencies of HF DSC and in each case the associated RTP frequencies.***

#### **4.3 National DSC coast station arrangements**

***Aims:*** To examine the configuration of DSC coast radio stations (CRS) within the national SRR.

**Objectives:** By the end of the session the participant will be able to ***list correctly from memory, the RCC(s) and CRS(s) in own SRR which are provided with MF DSC.***

#### **4.4 DSC action by ships and CRSs**

***Aims:*** To explore in greatest possible depth the procedure laid down for operation of the DSC system.

**Objectives:** By the end of the session the participant will be able to:

***discuss accurately from memory, when an RCC should acknowledge a distress alert from a ship at sea under varying circumstances:***

- .1 position is in the RCC SRR;***
- .2 position is outside the RCC SRR; and***
- .3 no position information is shown on alert;***

***discuss accurately from memory, the subsequent action required of a CRS having acknowledged a DSC distress alert;***

***state correctly from memory, under what circumstances a DSC distress alert would be acknowledged by a ship station;***

***state correctly from memory, under what circumstances a DSC distress alert relay would be transmitted by a ship station;***

***state correctly from memory, under what circumstances a DSC distress alert relay would normally be transmitted by a CRS;***

***discuss accurately from memory, the circumstances under which a DSC distress alert relay would be transmitted by a CRS;***

***state correctly from memory, what action is required by a CRS receiving a distress alert relay from another CRS;***

***state accurately from memory, what action is required by a CRS receiving a distress alert acknowledgement from another CRS;***

***state accurately from memory, what action is required by a CRS in receipt of a distress alert relay from a ship station; and***

***state correctly from memory, under what circumstances a DSC acknowledgement is required from a CRS when dealing with urgency, safety and routine alerts.***

#### **4.5 Overview of HF DSC**

***Aims:*** To ensure that participants are aware of the HF DSC system, the areas it applies to and which countries are directly involved.

**Objectives:** By the end of the session the participant will be able to:

***discuss accurately from memory, the areas of the globe where HF radio can achieve propagation;***

***state correctly from memory, how HF DSC and associated procedure compares to that of MF DSC;***

***state correctly from memory, where HF DSC coast radio stations are situated; and***

***state correctly from memory, the message routing procedure from HF DSC CRSs to the appropriate RCC for SAR action.***

### **SECTION 5 – RTP communications**

#### **5.1 Distress**

***Aims:*** To revise correct radio procedure for all communications relating to distress situations.

**Objectives:** By the end of the session the participant will be able to:

***state correctly from memory, under what circumstances a ship is permitted to use the distress call;***

***state correctly from memory, the meaning of the terms "distress signal", "distress call" and "distress message";***

***demonstrate from memory, complete and accurate understanding of the correct format and content of a standard distress message;***

***demonstrate from memory, accurate understanding of the correct format for a distress acknowledgement;***

***discuss accurately from memory, an effective choice of timing for a distress acknowledgement in two situations of varying gravity and urgency;***

***demonstrate from memory, complete and accurate understanding of the correct format and content of a distress alert relay message, given different sets of circumstances – Distress by RTP;***

***state correctly from memory, two formats permitted for position information in a distress alert relay message;***

***discuss accurately from memory, when the prowords "seelonce distress" and "seelonce mayday" would be used;***

***discuss accurately from memory, the correct procedure for terminating a distress situation;***

***discuss accurately from memory, the correct procedure for lifting silence, but retaining restricted working on an RTP frequency; and***

***state the correct proword which should precede every communication related to a distress incident.***

## **5.2 Urgency**

***Aims:*** To enable the participant to revise RTP communications procedure relevant to urgency situations.

***Objectives:*** By the end of the session the participant will be able to:

***state correctly from memory, the circumstances in which a ship is permitted to use the urgency signal;***

***state correctly from memory, the meaning of the terms "urgency signal", "urgency call" and "urgency message";***

***demonstrate from memory, an accurate knowledge of the correct format for a standard urgency message from a ship;***

***demonstrate from memory, an accurate knowledge of the correct format for an urgency acknowledgement message;***

***demonstrate from memory, an accurate knowledge of the correct format for a standard urgency relay broadcast;***

***state correctly from memory, when an urgency broadcast for a red flare report will normally become a distress alert relay;***

***state correctly from memory, the type of message you would expect to receive from a ship which has sighted a red flare from an unknown source; and***

***state correctly from memory, the type of broadcast which would be made for a medical situation on board ship.***

### **5.3 Small craft safety information (SCSI) broadcasts where applicable**

***Aims:*** To revise the format and procedure relevant to the uncertainty phase of SAR operations.

**Objectives:** By the end of the session the participant will be able to:

***state correctly from memory, the meaning of the term "uncertainty phase" and the associated key word(s);***

***demonstrate correctly from memory, how the SCSI broadcast should be announced;***

***demonstrate correctly from memory, a professional and efficient format for the SCSI broadcast;***

***state correctly from memory, the frequencies/channels which should be used to announce and broadcast a SCSI broadcast;***

***state correctly from memory, how a SCSI broadcast is repeated;***

***state correctly from memory, what action should be considered having broadcast a SCSI twice, but no positive information is forthcoming; and***

***demonstrate accurately from memory, how a SCSI broadcast should be cancelled.***

### **5.4 Safety**

***Aims:*** To revise the format and procedure relevant to safety communications and broadcasts.

**Objectives:** By the end of the session the participants will be able to:

***state correctly from memory, the meaning of the term "safety signal";***

***state correctly from memory, what is the correct usage of the safety signal and message;***

***state correctly from memory, in what circumstances an RCC should make a local navigation warning;***

***state correctly from memory, under what circumstances broadcasts warning of drifting hazards should be repeated;***

***state correctly from memory, the frequency with which warnings relating to navigation buoys off station should be repeated;***

***state correctly from memory, the frequency with which warnings relating to defective or extinguished navigation lights should be repeated;***



***state correctly from memory, what frequencies and medium should be used for safety broadcasts, both in terms of RTP, satellite and DSC communications; and***

***demonstrate from memory, a satisfactory format for safety broadcasts which closely resembles those for distress and urgency situations, and which indicates an efficient and professional approach.***

## **5.5 Routine communications and ITU Radio Regulations**

***Aims:*** To revise well-established national and ITU routine radio procedure and clarify some of the relevant ITU Radio Regulations.

**Objectives:** By the end of the session the participant will be able to:

***describe accurately from memory and demonstrate competent use of the rhythm-speed-volume-pitch (RSVP) principles during RTP communications;***

***demonstrate from memory, the use of 10 out of 15 commonly used prowords, in the correct format and context;***

***state correctly from memory, the maximum length of an RTP transmission on the distress frequencies;***

***state correctly from memory, the maximum length of an RTP test transmission on the distress frequencies and state correctly from memory one item of information which must be included in this transmission;***

***describe accurately from memory, the full call, abbreviated call and call serving as address, procedures as they apply to RTP transmissions;***

***list correctly and be able to describe accurately from memory, four responses to a radio check which indicates the signal strength;***

***list correctly and be able to describe accurately from memory, four responses to a radio check which indicates the readability of the modulated signal;***

***state correctly from memory, the appropriate time zone used to identify all radio transmissions and log entries;***

***state correctly from memory, what frequencies ships must monitor continuously in the GMDSS;***

***describe accurately from memory, the regulations which direct ships to keep a VHF radio watch for distress communications;***

***describe accurately from memory, the procedure to be adopted when a calling station has difficulty in raising another station;***

***state correctly from memory, who is designated as the controlling station during communications between a ship and a shore station;***

***describe accurately from memory, the action to be taken when a station hears a call, but is not certain that the call was intended for it;***

***discuss accurately from memory, the content of ITU Radio Regulations in respect of radio secrecy;***

***discuss accurately with the aid of study notes, guidelines designed to help avoid radio interference;***

***discuss accurately with the aid of study notes, guidelines designed to regulate preliminary radio operations;***

***list correctly from memory, the VHF channels RCCs and CRSs are licensed to operate; and***

***list correctly with the aid of a handout, the MF frequencies RCCs and CRSs are licensed to operate.***

## **5.6 RTP communications integrity**

***Aim:*** To revise the role of RCCs, CRSs and CESs in policing the integrity of distress and working frequencies of RTP communications where appropriate.

**Objectives:** By the end of the session the participant will be able to:

***discuss accurately from memory, the responsibility of RCCs, CRSs or GMDSS shore-based facilities for the mobile satellite service in relation to misuse of RTP frequencies;***

***discuss accurately from memory, the RCCs, CRSs or GMDSS shore-based facilities for the mobile satellite service guidelines as to when action should be taken against a rogue RTP station; and***

***state correctly from memory, where guidelines as to appropriate warning messages to stations misusing RTP can be located, and where you would find the appropriate report form should further action be required.***

## **SECTION 6 – SATCOMS/Recognized mobile satellite services**

### **6.1 General overview**

***Aims:*** To investigate the background and characteristics of the different recognized mobile satellite services (RMSSs).

**Objectives:** By the end of the session the participant will be able to:

***state correctly from memory, how many satellites are involved in different RMSSs;***

***state correctly from memory, the satellite orbit characteristics of different RMSSs;***

***with the aid of a handout, discuss briefly but accurately the history of different RMSSs;***

***list correctly from memory, the different RMSS areas for operations, and state correctly from memory which areas are applicable to your SRR;***

***state correctly from memory, what the nominal coverage of different RMSSs are, as designated under the GMDSS, and state correctly from memory the coverage which has been achieved in practice; and***

***with the aid of a handout, list correctly the radio frequencies utilized by different RMSSs, and with the aid of a handout, state correctly the purpose of each frequency.***

## **6.2 Component parts of the systems**

***Aims:*** To examine the component parts of different RMSS data routing systems, and the role played by each part.

**Objectives:** By the end of the session the participant will be able to:

***list correctly from memory, the contributing parts of different RMSS data routing systems;***

***state correctly from memory, the meaning of their acronyms;***

***state accurately from memory, the concept for provision of different GMDSS shore-based facilities in the mobile satellite service throughout the world in terms of the operating authority; and***

***state correctly from memory, the location of different RMSS headquarters; and state accurately from memory, the role of the key components of different RMSSs.***

## **6.3 Variety of communications**

***Aims:*** To discuss the types of communication methods and messages which can be processed using different RMSSs.

**Objectives:** By the end of the session the participant will be able to:

***list correctly from memory, the different types of communication methods provided for by each RMSS; and***

***list correctly from memory, four categories of messages which can be processed using each RMSS.***

## **6.4 System equipment**

***Aims:*** To examine the various standards of equipment available now and proposed for the future by mobile satellite services. Such examination will categorize each system as GMDSS acceptable or not, and which types of communications are achievable through each system.

**Objectives:** By the end of the session the participant will be able to:

***list correctly from memory, the different standards of equipment, including those currently in use and those planned for the future;***

***distinguish correctly from memory, between the two acronyms ADE and BDE;***

***list correctly from memory, all three types of communications available through RMSSs;***

***list correctly with the aid of a handout, all types of communications available through different RMSSs; and***

***state correctly from memory, how distress messages can be processed using different RMSS SESs.***

## **6.5 Enhanced group call (EGC)**

***Aims:*** To examine the purpose and usage of different RMSS EGC systems.

***Objectives:*** By the end of the session the participant will be able to:

***state correctly from memory, the correct meaning of the acronym EGC;***

***state accurately from memory, the concept of the EGC system;***

***state correctly from memory, the different subsystems which operate within the EGC system;***

***list correctly from memory, all types of messages handled by EGC;***

***list correctly from memory, all ways of addressing an EGC message; and***

***state correctly with reference to a handout, the meaning of the term "information provider" where necessary.***

## **SECTION 7 – NAVTEX services**

### **7.1 General overview**

***Aims:*** To examine in detail the concept and role of the NAVTEX system within the GMDSS.

***Objectives:*** By the end of the session the participant will be able to:

***state correctly from memory, two main functions of the NAVTEX system;***

***state correctly from memory, the voice communication frequency associated with NAVTEX;***

***state correctly with the aid of a handout, the alternative frequency made available for national (non-English) language broadcasts;***

***list correctly from memory, six out of nine main system characteristics for NAVTEX as laid down in the GMDSS regulations; and***

***with reference to a handout, describe accurately the structure of the NAVTEX system.***

### **7.2 Ship equipment and message priorities**

**Aims:** *To examine the role of ship NAVTEX equipment and identify it as receive only equipment, and to identify the levels of priority for message handling in the NAVTEX service.*

**Objectives:** By the end of the session the participant will be able to:

***state correctly from memory, the capabilities of the shipborne NAVTEX equipment in terms of transmission and reception; and***

***state correctly from memory, the three message priorities which can be assigned by NAVTEX CRSs.***

### **7.3 Message categories**

**Aim:** *To examine the various categories of message relevant to the NAVTEX system.*

**Objectives:** By the end of the session the participant will be able to:

***with reference to a handout, list correctly the 17 message categories of the NAVTEX system; and***

***state correctly from memory, the three message categories which cannot be de-programmed from the ship equipment.***

### **7.4 National NAVTEX system**

**Aims:** *To examine the National NAVTEX broadcast system in detail and gain an understanding of how a broadcast can be achieved by this means.*

**Objectives:** By the end of the session the participant will be able to:

***state correctly from memory, which area of the WWNWS the national SRR falls into;***

***state correctly from memory, the nominal and the likely maximum range of NAVTEX signals and the designated range of the National NAVTEX broadcasts; and***

***list correctly from memory, the National NAVTEX broadcast remote aerial sites, and state correctly from memory, where the NAVTEX system is controlled from.***

## **SECTION 8 – EPIRBs**

### **8.1 General overview**

**Aims:** *To investigate all distress beacon types which use 406 MHz through the COSPAS-SARSAT system and to discuss which are acceptable under the GMDSS carriage requirements. The session will, identify what is recognized under the GMDSS but also cover other 406 MHz beacon types that may be activated in the maritime domain.*

**Objectives:** By the end of the session the participant will be able to:

***list correctly from memory, all types of EPIRBs available to a mariner;***

*state correctly from memory, which EPIRB types are acceptable to the GMDSS regulations;*

*state correctly on every occasion, which type of EPIRB is acceptable to any given sea area in the GMDSS system; and*

*discuss accurately with the aid of handouts, where necessary, basic characteristics of the EPIRB types not acceptable to the GMDSS, and where each of them might be used.*

## **8.2 The COSPAS-SARSAT system**

**Aims:** *To examine in detail the COSPAS-SARSAT satellite system, revealing the more important characteristics and component parts.*

**Objectives:** By the end of the session the participant will be able to:

*describe accurately with the aid of a handout, the origins of the COSPAS-SARSAT system, and be able to discuss those countries involved;*

*describe accurately with the aid of a handout, characteristics of different satellites used in the COSPAS-SARSAT system;*

*list correctly from memory, ground elements which together make up the ground processing of COSPAS-SARSAT maritime distress alerting messages;*

*describe with the aid of a handout, the system of routing COSPAS-SARSAT distress alert messages on a global basis;*

*describe accurately with the aid of a handout, the meaning of the Doppler effect and how it applies to the COSPAS-SARSAT system;*

*state correctly from memory, the location accuracy to be applied to 406 MHz beacon-derived distress positions;*

*list correctly with the aid of a handout, power and battery life characteristics of 406 MHz EPIRBs;*

*accurately compare and contrast from memory, the global and real-time modes of operation in the COSPAS-SARSAT system;*

*describe accurately from memory the meaning of the term "merged solution" in terms of COSPAS-SARSAT system distress alerts, and discuss how this affects information on a distress alert message;*

*demonstrate accurately on every occasion, analysis of COSPAS-SARSAT system distress alert messages; and*

*describe accurately from memory, the differences between MEOSAR, GEOSAR and LEOSAR EPIRB systems.*

## **8.3 Approved EPIRBs and EPIRB databases**

**Aims:** *To develop understanding of characteristics of EPIRBs used in the GMDSS system.*

**Objectives:** By the end of the session participants will be able to:

*with the aid of a handout, accurately describe the pertinent details of all EPIRB systems approved for use in the GMDSS;*

*demonstrate knowledge about national and international EPIRB databases and 406 MHz beacon protocols; and*

*understand the use of 121.5 MHz as a homing frequency.*

## **SECTION 9 – Emergency portable VHF radios**

### **9.1 General requirements**

**Aims:** *To explore the requirements under the GMDSS for the carriage of emergency portable VHF radio units.*

**Objectives:** By the end of the session the participant will be able to:

*state correctly from memory, the number of such radio units required for ships of different sizes;*

*describe accurately from memory, where the radio units should be stowed on board ship;*

*state correctly from memory, what additional provision must be made if the radio units are to be used in conjunction with day-to-day business of the ship; and*

*state accurately from memory, the purpose of emergency portable VHF radio units.*

### **9.2 Mandatory channels**

**Aims:** *To introduce the participants to the VHF channels which are mandatory under GMDSS provisions and the purposes of each.*

**Objectives:** By the end of the session the participant will be able to:

*list correctly from memory, all three VHF radio channels mandatory under GMDSS provisions; and*

*state accurately from memory, the correct designation of VHF channels 16, 06 and 13.*

## **SECTION 10 – Devices for locating**

### **10.1 General overview**

**Aims:** *To examine the concept and purpose of different devices for locating, the frequency band of operations, the equipment required to detect different signals for locating and the nature of such signals.*

**Objectives:** By the end of the session the participant will be able to:

***state correctly from memory, what the primary purpose of the devices for locating is;***

***state correctly from memory, what type of equipment is required to detect different signals for locating;***

***state correctly from memory the recommended choice of radar range setting in order to detect radar SART signals;***

***describe accurately from memory, the radar image expected from a radar SART from first detection to that experienced when well within 1 nautical mile from the transponder; and***

***state correctly from memory, how a survivor in the presence of an operating radar SART would know the transponder was being interrogated by approaching radar.***

## **10.2 Positioning aboard ship**

***Aims:*** To describe how many devices for locating must be carried and where they may be located on board GMDSS ships.

***Objectives:*** By the end of the session the participant will be able to:

***state correctly from memory, how many devices for locating must be carried by ships of less than 500 gt, ships greater than 500 gt and passenger ships; and***

***state correctly from memory, where on board a ship the required complement of device for locating should be stowed.***

## **10.3 Technical specification**

***Aims:*** To determine and understand the specifications of a device for locating as designated by GMDSS regulations.

***Objectives:*** By the end of the session the participant will be able to:

***state correctly from memory, the frequency bands designated for radar SART and AIS-SART transmissions;***

***state correctly from memory, the required minimum operating life of radar SART and AIS-SART batteries, including standby and operating time;***

***state correctly with the aid of a handout, the operating temperature range for a radar SART and AIS-SART; and***

***describe accurately from memory, the display expected from an AIS-SART on the equipment on board the ship receiving the AIS-SART signal.***

## **10.4 Range of signals for locating**

***Aims:*** To explore the issue of detection range for different signal for locating both from theoretical specification and practical application.



**Objectives:** By the end of the session the participant will be able to:

***state correctly from memory, the IMO specified performance criteria relating to the range of detection of different signals for locating;***

***state correctly from memory, the two examples of SART signal detection range as experienced by surface and airborne SAR units;***

***state correctly from memory, any SAR facility that has no capability to detect SARTs;***

***state accurately from memory, with reference to three out of five guidelines factors which may affect the detection range of SARTs; and***

***describe accurately the difference between the radar SART and AIS-SART signals.***

## **SECTION 11 – Concept of RCC and SAR operations**

### **11.1 Equipment types**

***Aim:*** To introduce participants to the types of communication equipment operated by RCCs or CRSs in which they operate.

**Objective:** By the end of the session participants will be able to ***correctly name from memory all types of RCC or CRS radio communication equipment used in operation rooms.***

### **11.2 Workstations**

***Aim:*** To raise the awareness of participants as to the correct procedure of handing over a VHF channel 16 watch and associated equipment checks to make.

**Objective:** By the end of the session participants will be able to ***list correctly from memory, all key considerations in terms of continuity of watchkeeping and equipment checks for the operator's attention when taking over the VHF channel 16 watch from a colleague.***

### **11.3 Log keeping**

***Aim:*** To ensure all participants understand and are in a position to apply the correct log keeping procedure at radio watchkeeping workstations.

**Objective:** By the end of the session the participant will be able to ***describe accurately from memory, all key considerations and log entries when maintaining a radio log.***

### **11.4 Publications**

***Aim:*** To raise the awareness of participants to written procedural support material held as standard issue at RCCs.

**Objectives:** By the end of the session participants will be able to:

***list correctly from memory, five publications held as standard issue at RCCs; and***

***state accurately from memory, in which publication to find particular details relating to maritime communications on seven out of ten occasions.***

#### **11.5 Codes, signals and standard phrases**

***Aim:*** To ensure all participants understand and can practise international codes, signals and standard phrases.

**Objective:** By the end of the session the participant will be able to:

***use the International Code of Signals (ICS), as appropriate;***

***use spoken emergency signals and procedural words; and***

***communicate in RTP and in written message by using the IMO Standard Marine Communication Phrases (SMCP).***

#### **11.6 Communications for SAR operations**

***Aim:*** To ensure all participants can select SAR-dedicated frequencies and communicate with all SAR components of a SAR operation.

**Objective:** By the end of the session the participant will be able to:

***select SAR-dedicated frequencies;***

***format distress and safety messages;***

***communicate with all participants of a SAR operation;***

***draft SAR operation messages including situation report (SITREP), search action messages, rescue action messages and other SAR messages;***

***understand distress alert information from CRSs, GMDSS shore-based facilities of mobile satellite services and COSPAS-SARSAT; and***

***relay distress alert information to other RCCs and communicate with them.***

#### **11.7 Authority and responsibility for communications by national RCCs, CRSs and GMDSS shore-based facilities**

***Aim:*** To ensure participants understand levels of authority and responsibility involved in operating RCC, CRS and GMDSS shore-based facility communication equipment and the responsibility for local training and development.

**Objectives:** By the end of the session participants will be able to:

***state accurately from memory, by whose authority RCC, CRS and GMDSS shore-based facilities of mobile satellite services communication equipment is operated;***

***state accurately and from memory, who is responsible for correct operation and use of RCC, CRS and GMDSS shore-based facilities of mobile satellite services communication equipment; and***

*state accurately and from memory, who is responsible for ensuring the provision of adequate training for individuals in the operation and use of RCC, CRS and GMDSS shore-based facilities of mobile satellite services communication equipment.*

#### **11.8 Advice to the public on efficient radio procedure and use of radiocommunication equipment**

*Aims: To raise awareness among participants as to national RCC, CRS or GMDSS shore-based facilities of mobile satellite services policy on giving advice to members of the public regarding the installation and operation of communication equipment.*

**Objectives:** By the end of the session participants will be able to:

*state correctly from memory, where to find details of official advice as to GMDSS equipment carriage recommendations for pleasure craft;*

*state correctly from memory, where to find details of official advice as to GMDSS equipment carriage regulations and recommendations for fishing vessels;*

*list accurately from memory, the radiocommunication equipment carriage requirements for all ships; and*

*list accurately from memory, five reasons why mobile telephone equipment is not the preferred choice of communication equipment at sea.*

#### **11.9 Equipment user manuals and guides**

*Aims: To remind participants of the importance of maintaining user manuals and guides in good condition and their shared availability among all members of operations room staff.*

**Objectives:** By the end of the session the participant will be able to:

*identify accurately with the aid of student notes, all user manuals available to support equipment currently installed at an RCC; and*

*state from memory, where these manuals are located, or make a verbal report as to how he/she would arrange for these manuals to be stored and made available to all staff.*

#### **11.10 Equipment power delivery**

*Aims: To raise the awareness of participants of his/her station's provisions for backup power supplies and standby batteries.*

**Objectives:** By the end of the session the participant will be able to *describe accurately with the aid of study notes, the provision for uninterruptible power supply (UPS), standby generator or battery power at his/her site.*

### **SECTION 12 – Implications of the GMDSS for RCCs**

#### **12.1 Distress alerts**

**Aims:** *To explore in depth the procedure laid down for operation of distress alerts received through different radiocommunication systems.*

**Objectives:** By the end of the session the participant will be able to:

***state accurately from memory, when an RCC acknowledges a distress alert from a ship at sea under varying circumstances:***

- .1 Position is within own SRR;***
- .2 Position is outside own SRR; and***
- .3 When no position information is given in the alert;***

***elaborate accurately from memory, the subsequent action required of an RCC having acknowledged an alert received through different radiocommunication systems;***

***state correctly from memory, under which circumstances an alert received through different radiocommunication systems would normally be relayed to another RCC;***

***elaborate accurately from memory, the circumstances under which distress relay alert would be transmitted by an RCC, and explain by what means this distress alert relay can be performed;***

***state correctly from memory, which actions are required by an RCC receiving a distress alert relay from another RCC;***

***state accurately from memory, which actions are required by a CRS receiving a distress alert acknowledgement from another CRS; and***

***state accurately from memory which actions are required by an RCC in receipt of a distress alert relay from a ship station.***

## **12.2 False alerts**

**Aims:** *To examine the procedures laid down on how to handle false alerts.*

**Objectives:** By the end of the session, the participant will be able to ***describe accurately procedures for RCCs on receipt of false alerts.***

## **12.3 Interference problems**

**Aims:** *To manage radiocommunications in case of interference.*

**Objective:** By the end of the session, the participant will be able to:

***use reserve frequencies in case of interference; and***

***use the appropriate commands to make silence on the frequency.***

## **12.4 Information gathering**

**Aims:** *To revisit the subject of information gathering and examine the implications of the GMDSS and other radio equipment in this area.*

**Objective:** By the end of the session the participant will be able to:

*list accurately from memory, all means available under the GMDSS provisions by which RCCs can achieve broadcast action;*

*describe accurately from memory, in terms of target audience, the frequencies and/or channels available for broadcast action;*

*describe accurately from memory, in terms of target area, the choice of communications medium for broadcast action;*

*list correctly from memory, the potential means of holding reasonably secure telephone communications with the master of a ship;*

*describe accurately, with the aid of a handout, the concept of any radio link system calls through CRS facilities;*

*state correctly from memory, on which of the RMSSs radiotelephone communication is available;*

*state correctly from memory, on which of the RMSSs, telex communication is available;*

*list accurately from memory, all methods of achieving a telephone call to a ship by RMSSs; and*

*describe accurately from memory, the procedure which should be followed to achieve a NAVTEX broadcast in an SRR.*

## 12.5 Search planning

**Aims:** To examine the implications of GMDSS equipment for day-to-day decision-making in search planning problems.

**Objectives:** By the end of the session the participant will be able to:

*describe accurately the remaining possibility nowadays to receive a distress alert by 121.5 MHz ELTs/PLBs, and state correctly from memory what implication this may be to a search and rescue mission coordinator (SMC) during search planning;*

*describe accurately from memory, reasons why no survivors may be in the vicinity of an EPIRB located at sea;*

*describe accurately from memory, difficulties which may hinder the deployment of radar SART or AIS-SART by survivors, and why location of the SARTs will not always succeed in locating all survivors;*

*describe the different types of EPIRBs in use and purchase on the market;*

*describe accurately from memory, the time delay which may be experienced between the fixing of a Doppler position and receipt of the COSPAS-SARSAT alert message at an RCC, and state correctly what implication this may have for a valid search plan;*

***describe accurately from memory, the implications for initial position error to a position derived from RMSS distress alert messages; and***

***state correctly from memory what guidelines, in terms of time, would be considered when terminating a search for EPIRBs, radar SARTs, AIS-SARTs or any other devices for locating.***

## **12.6 Effort allocation**

***Aims:*** To examine the implications of GMDSS equipment on day-to-day decision-making in terms of effort allocation to a search.

**Objectives:** By the end of the session the participant will be able to:

***state accurately with the aid of a handout, the nominal range of VHF radio signals in all six situations with regard to craft type and antenna height; and***

***state correctly from memory, the implications for track spacing during a search for EPIRBs with a 121.5 MHz homer, or a radar SART, AIS-SART or any other devices for locating and a target known to have a portable handheld VHF radio.***

## **12.7 Search instructions**

***Aims:*** To revise the concept of complete and unambiguous search instructions and how requirements for contents might change as a result of GMDSS equipment.

**Objectives:** By the end of the session the participant will be able to ***state accurately from memory, the need to furnish complete and specific instructions in terms of equipment such as radar SART, AIS-SART and portable VHF radio or any other devices for locating.***

## **12.8 Probability of detection (PoD)**

***Aims:*** To examine the potential effect of GMDSS equipment on choice of track spacing compared with choices relevant to more traditional search targets.

**Objectives:** By the end of the session the participant will be able to ***describe accurately from memory, the implications for PoD when searching an area for targets such as VHF radio, 121.5 MHz homer, radar SARTs, AIS-SART or any other devices for locating.***

## **12.9 Decoding MMSIs, serial numbers and alert messages, and databases**

***Aims:*** To ensure participants have a comprehensive understanding of all identification numbers and message formats relevant to the GMDSS system and know how to decode them, and which publications and databases are available.

**Objectives:** By the end of the session the participant will be able to:

***demonstrate from memory, correct analysis of distress alert messages related to EPIRBs;***

***demonstrate decoding of an MMSI;***

***discuss accurately from memory, the usage of serial identification numbers, MMSI and call sign identification for EPIRBs;***

***state correctly from memory, what is meant by the term "SPOC" and where you would find related contact information; and***

***list national and international databases relevant to the GMDSS.***

## **SECTION 13 – Practical use of RCC and GMDSS shore-based facility communication equipment**

### **13.1 Communication equipment**

***Aims:*** *To ensure participants are familiar with all items of communication equipment and understand all the user functions and fault recognition with each.*

**Objectives:** By the end of the session the participants will be able to:

***demonstrate accurately from memory, adequate knowledge about, and how to operate, all types of communication equipment at own RCC or CRS;***

***describe accurately from memory, the correct basic fault reporting procedure for radio equipment, and state accurately from memory to whom the signals are forwarded; and***

***state correctly from memory, where to find the correct format for radio fault reporting and the designation of fault priorities.***

### **13.2 Other types of SATCOMS message broadcast**

***Aims:*** *To examine the procedures laid down to send broadcasts via other types of RMSS message broadcast.*

**Objectives:** By the end of the session the participant will be able to ***state correctly from memory all types of broadcast and areas to which an RCC can broadcast to on a RMSS.***

### **13.3 Testing and maintenance of GMDSS equipment**

***Aims:*** *To examine the procedures to test and maintain GMDSS equipment.*

**Objectives:** By the end of the session the participant will be able to:

***test different GMDSS equipment of the RCC, CRS and GMDSS shore-based facilities of mobile satellite services; and***

***identify the main issues of maintenance of the GMDSS equipment in use.***

## **SECTION 14 – Telephone, fax and RTP calls to ships**

### **14.1 Methods of making calls**

***Aims:*** *To increase the awareness of participants to the various means of placing shore-to-ship calls, by telephone, fax, telex and any other format message, and to offer information on the appropriate charge bands for such calls.*

**Objectives:** By the end of the session the participant will be able to:

***describe accurately how to place a telephone, fax, telex and any other format message call directly from the operation room to a ship station by RMSSs;***

***describe accurately from notes, the concept integrated command and control system (ICCS) conference call, and list correctly from memory, the details which will be required when attempting to place calls by such means;***

***list accurately from memory, the advantages and disadvantages of using mobile phones for communication with ships; and***

***describe accurately from memory the potential usage of such telephone, telex, fax and any other format message calls from an RCC to ships.***

#### **14.2 Methods of charging calls**

***Aims:*** *To increase the awareness of participants to different means of charging calls, by telephone, fax, telex and any other format message from shore to ships.*

***Objectives:*** *By the end of the session the participant will be able to **understand the method to charge telephone, fax and any other format message calls to ships.***

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