



Australian Government

Department of Education, Employment and Workplace Relations

TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

Revision Number: 1

TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

Modification History

Not applicable.

Unit Descriptor

UNIT DESCRIPTOR:

This unit involves the skills and knowledge required to transmit and receive information by GMDSS subsystems and equipment, including using the equipment for search and rescue radio communication, preventing false distress alerts, mitigating the effects of false distress alerts, implementing preventative safety measures in relation to radio equipment hazards, and providing radio services during emergencies such as abandonment of vessel, fire on board vessel, and breakdown of radio installations.

Application of the Unit

| | |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application of the unit | The unit has applications in qualifications for Masters of commercial vessels requiring proficiency in the use of GMDSS subsystems and equipment to transmit and receive information to and from shore and vessel-based operators. |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Licensing/Regulatory Information

| | |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Licensing/legislative requirements | The unit is consistent with the relevant maritime regulations and certification requirements as specified in Marine Orders, Part 6, Marine Radio Qualifications, Issue 5. |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

| | |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes of a unit of competency.</i> | <i>Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.</i> |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Elements and Performance Criteria

| ELEMENT | PERFORMANCE CRITERIA |
|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 Operate GMDSS subsystems and equipment to transmit and receive messages</p> | <ul style="list-style-type: none"> a Types of GMDSS communication equipment are selected and operated within limits of specifications b GMDSS communication equipment is operated to transmit and receive various types of signal in accordance with manufacturer's instructions, established GMDSS procedures and regulatory requirements c GMDSS procedures appropriate for the sea area concerned are correctly applied in accordance with regulatory requirements d Regulations and procedures applicable to vessel stations equipped with GMDSS communication equipment and digital selective calling (DSC) facilities are applied during radio communication e OH&S procedures and hazard control strategies are applied when operating radio equipment in accordance with vessel's ISM Code safety management system |
| ELEMENT | PERFORMANCE CRITERIA |

| ELEMENT | PERFORMANCE CRITERIA |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 Maintain and fault-find radio equipment | <ul style="list-style-type: none">a Routine maintenance checks are carried out on GMDSS equipment in accordance with manufacturer's instructions and specifications and company proceduresb Out-of-specification performance and faults in GMDSS equipment are correctly identified and investigated using prescribed fault finding techniques in accordance with established user maintenance procedures and manufacturer's instructionsc Identified faults and defective GMDSS equipment and component parts are rectified or replaced in accordance with manufacturer's instructions and established maintenance procedures |
| 3 Provide radio services during emergencies | <ul style="list-style-type: none">a Radio procedures as defined in the international and national radio regulations and SOLAS Convention are applied during emergency situations and search and rescue operations |

Required Skills and Knowledge

REQUIRED KNOWLEDGE

This describes the knowledge required for this unit.

- 1 Sections of maritime regulations related to marine radio communication
- 2 International and national radio regulations applicable to mobile marine communication
- 3 Principles of radio propagation, including:
 - a basic propagation mechanisms at LF, MF, HF and VHF
 - b maximum useable frequency (MUF)
 - c optimum working frequency (OWF)
 - d frequency bands
 - e classes of emission

REQUIRED KNOWLEDGE

- f duplex, simplex paired frequencies and ITU channels
- 4 Different types of marine radio equipment, their features, applications, operating characteristics and operating procedures
- 5 Prohibitions on connecting non-GMDSS equipment
- 6 Types, applications and features of basic antenna systems used in marine radio communication
- 7 Basic principles and procedures for marine radio communication, including:
 - a correct use of frequencies, frequency bands and modes of emission
 - b frequencies for routine call and reply
 - c distress, urgency and safety communication
 - d definition of coverage and sea areas for digital selective calling (DSC)
 - e radio calling, replying and relaying procedures
 - f purpose of silence periods when operating radio equipment
 - g limitations on the performance of different types of marine radio equipment
 - h purpose for and procedures for the monitoring of calling and working frequencies
 - i methods of communicating vessel position
- 8 Procedures for using various GMDSS systems and services, including:
 - a Inmarsat services (A, B, C, M and E)
 - b enhanced group calling system (EGC)
 - c DSC facilities and usage
 - d EGC receiver
 - e MSI services
 - f NAVTEXT system
 - g SafetyNET system

- e MSI services
- 9 Procedures for deploying and operating survival craft radio equipment, including EPIRBs and SARTs
- 10 The principles and procedures of the search and rescue (SAR) system, including:
 - a the role of the Rescue Coordination Centre
 - b the role of a SAR unit
 - c the use and operation of vessel reporting systems, including AUSREP and AMVER
- 11 Maintenance strategies and requirements for GMDSS equipment as defined in SOLAS and Radio Regulations
- 12 Operational checks, including:
 - a checking of radio performance (using built in test facilities)
 - b testing fuses
 - c measuring capacity of batteries and the specific gravity of the electrolyte
 - d measuring on and off load voltage.

- e MSI services
- 13 Radio equipment faults and defects and related fault finding techniques and remedial procedures
- 14 Hazards associated with radio transmission and the repair and maintenance of radio equipment and related hazard control measures and OH&S regulations.
- 15 A basic understanding of the Australian marine search and rescue system
- 16 Procedures for the transmitting and decoding of the phonetic alphabet excluding the figure code
- 17 Radio communication problems and appropriate action and solutions
- 18 Procedures for keeping records of radio communication

REQUIRED SKILLS

This describes the basic skills required for this unit.

- 1 Communicate effectively with others when using GMDSS subsystems and equipment
- 2 Read and interpret instructions for the use of GMDSS subsystems and equipment
- 3 Read and interpret marine radio regulations, rules and instructions
- 4 Use the phonetic alphabet
- 5 Keep records of radio communication
- 6 Work collaboratively with other shipboard personnel and passengers
- 7 Recognise typical faults and problems with GMDSS subsystems and equipment and take appropriate action
- 8 Adapt to changes in GMDSS subsystems and equipment and related procedures
- 9 Operate the GMDSS subsystems and equipment in accordance with manufacturer's instructions
- 10 Conduct operational checks on GMDSS subsystems and equipment
- 11 Apply OH&S procedures and precautions when using and checking GMDSS subsystems and equipment

Evidence Guide

| |
|------------------------------------------------------------------------------------------------------------|
| Evidence Guide TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT |
|------------------------------------------------------------------------------------------------------------|

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

| | |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Critical aspects of evidence required to demonstrate competency in this unit | Assessment must confirm appropriate knowledge and skills to: <ul style="list-style-type: none">a Operate GMDSS sub systems and equipment to transmit and receive messagesb Maintain and fault-find GMDSS radio equipmentc Access search and rescue radio facilitiesd Deploy and operate an EPIRB and a SARTe Maintain records of radio communication |
| 2 Evidence required for demonstration of consistent performance | <ul style="list-style-type: none">a Performance is demonstrated consistently over a period of time and in a suitable range of contextsb Consistently applies underpinning knowledge and skills when:<ul style="list-style-type: none">1 operating GMDSS subsystems and equipment to transmit and receive messages2 maintaining and fault finding GMDSS equipment3 accessing search and rescue radio facilities4 deploying and operating an EPIRB and a SART5 identifying and evaluating radio communication problems and determining appropriate courses of action6 maintaining records of radio communicationc Shows evidence of application of relevant workplace |

Evidence Guide
TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS
SUBSYSTEMS AND EQUIPMENT

- procedures, including:
- 1 relevant sections of IMO STCW 95 Convention and Code and AMSA Marine Orders
 - 2 OH&S procedures and legislation
 - 3 job procedures and work instructions
 - 4 guidelines relating to the use of a GMDSS communication subsystems and equipment on board the vessel
- d Action is taken promptly to report radio communication problems in accordance with established procedures

Evidence Guide (continued)
TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS
SUBSYSTEMS AND EQUIPMENT

| | |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Evidence 2 required for demonstration of consistent performance (continued)</p> | <p>e Work is completed systematically with required attention to detail</p> <p>f Recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions between crew and others</p> |
| <p>3 Context of assessment</p> | <p>a Assessment of competency must comply with the assessment requirements of the relevant maritime regulations</p> <p>b Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation:</p> <ol style="list-style-type: none"> 1 As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations 2 Appropriate practical assessment must occur: <ol style="list-style-type: none"> i at the registered training organisation; and/or ii on an appropriate working or training vessel |

Evidence Guide (continued)
TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

4 Specific resources required for assessment

- Access is required to opportunities to:
- a demonstrate performance in suitably simulated radio communication activities using the GMDSS System covering a range of normal, emergency and search and rescue radio communication situations that may be typically experienced on a vessel; and/or
 - b use GMDSS radio communication equipment in an appropriate range of operational situations on board an operational commercial or training vessel

Range Statement

Range Statement
TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

VARIABLE

SCOPE

1. GENERAL CONTEXT

| | |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. Work must be carried out: | 1 in compliance with the relevant sections of the Radio Regulations adopted by the World Administrative Radio Conference for the Mobile Services (1987), and maritime regulations |
| b. Work is performed: | 1 relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes |

Range Statement

TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

| | |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>c. Work involves:</p> | <p>1 the application of principles of marine radiotelephony to accurately transmit and receive messages using the GMDSS system. Use of correct procedures for transmitting and receiving of signals using GMDSS equipment appropriate for the sea area concerned, as well as deployment and operation of satellite EPIRBs and SARTs is required</p> |
| <p>d. Work requires:</p> | <p>1 the accurate and consistent use and user maintenance of the GMDSS system to send and receive messages and signals under normal and emergency situations in accordance with international and national radio regulations</p> |
| <p>2. WORKSITE ENVIRONMENT</p> | |
| <p>a Communication may be carried out:</p> | <p>1 in both normal and emergency situations using GMDSS equipment appropriate for the sea area concerned, emergency position indicating radio beacons (EPIRBs) and SARTs</p> |
| <p>b Communication using the GMDSS system may be carried out:</p> | <p>1 by day or night in both normal and emergency situations 2 under any possible conditions of weather 3 while underway 4 while anchored or moored</p> |
| <p>c Radio equipment may include:</p> | <p>1 radiotelephony transceiving equipment, including: i medium frequency/high frequency equipment (MF/HF) ii very high frequency equipment (VHF)</p> |

Range Statement (continued)
TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS
SUBSYSTEMS AND EQUIPMENT

| VARIABLE | SCOPE |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>c Radio equipment may include: (continued)</p> | <p>2 digital selective calling (DSC) equipment</p> <p>3 ECG receiver</p> <p>4 Navtext receiver</p> <p>5 emergency position indicating radio beacon (EPIRB)</p> <p>6 search and rescue transmitter (SART)</p> <p>7 batteries</p> <p>8 antennas</p> <p>9 electrical and radio cable connections</p> <p>10 electrical fuses</p> |
| <p>d Radio communication procedures may include:</p> | <p>1 calling a coast station by radiotelephone</p> <p>2 ordering a manually switched call</p> <p>3 terminating a call</p> <p>4 special facilities available, including methods of calling a coast station by DSC selecting an automatic radiotelephone call</p> |
| <p>e Radio communication may include:</p> | <p>1 normal vessel-to-vessel service</p> <p>2 normal vessel-to-shore service</p> <p>3 port operations service</p> <p>4 vessel movement service</p> |

Range Statement (continued)
TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

| | | |
|-------------------------------------------------------------------------------------|----|----------------------------|
| | 5 | distress |
| | 6 | urgency |
| | 7 | safety |
| | 8 | navigational |
| | 9 | medical advice |
| | 10 | on-board communication |
| | 11 | emergency position signals |
| f Organisations with which radio communication may be conducted may include: | 1 | coast stations |
| | 2 | limited coast stations |
| | 3 | private shore stations |
| | 4 | pilot and port stations |
| | 5 | aircraft stations |

Range Statement (continued)
TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

| VARIABLE | SCOPE | |
|-------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------------------|
| f Organisations with which radio communication may be conducted may include: (continued) | 6 | rescue coordination centres |
| | 7 | volunteer coast guard stations |
| | 8 | search and rescue coordination centre location and operator |
| | 9 | state police forces |
| | 10 | company bases |
| | 11 | fishing organisations and cooperatives |

Range Statement (continued)
TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT

| | |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>g Available radio services may include:</p> | <ol style="list-style-type: none"> 1 medical advice services 2 search and rescue 3 AUSREP 4 Inmarsat services (A, B, C, M and E) 5 public correspondence |
| <p>h EPIRB frequencies may include</p> | <ol style="list-style-type: none"> 1 406 MHz 2 121.5/243 MHz |
| <p>i Documentation and records may include</p> | <ol style="list-style-type: none"> 1 IMO STCW 95 Code concerning radio communication 2 sections of AMSA Marine Orders, NSCV and USL Code concerning radio communication 3 SOLAS Convention 4 radiotelephony regulations 5 radio communication log 6 radio equipment manufacturer's specifications and instructions 7 records of radio communication |
| <p>j Applicable legislation, regulations and codes may include:</p> | <ol style="list-style-type: none"> 1 IMO STCW 95 Convention and Code, NSCV and USL Code related to marine radio communication 2 relevant sections of AMSA Marine Orders related to marine radio communication 3 Radio regulations adopted by the World Administrative Radio Conference for the Mobile Services (1987) |

| |
|------------------------------------------------------------------------------------------------------------------------------------|
| <p>Range Statement (continued) TDMME807C TRANSMIT AND RECEIVE INFORMATION BY GMDSS SUBSYSTEMS AND EQUIPMENT</p> |
|------------------------------------------------------------------------------------------------------------------------------------|

| VARIABLE | SCOPE |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>j Applicable legislation, regulations and codes may include: (continued)</p> | <p>4 SOLAS Convention</p> <p>5 Australian radio communication legislation, including:</p> <ul style="list-style-type: none"> i Australian Communications Authority Act ii Radiocommunications Act (1992) iii Telecommunications Act iv Telecommunications (Transitional Provisions and Consequential Amendments) Act |

Unit Sector(s)

Not applicable.

Field

Field E Communication

Relationship to other units

| | |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Relationship to other units | The unit may be assessed in conjunction with other units that relate to the functions of the occupation(s) concerned. |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------|