

Innovation in GMDSS training courses

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The sea is an extensive and unregulated environment, and the safety of lives and the reduction of casualties are extremely important matters. For a long time, the focus has been to try to change the attitude and behaviour of those using the sea by improving their knowledge and training through education and awareness of safety initiatives. This article gives an overview of the development of two EU funded GMDSS internet platforms, and highlights a new e-learning initiative (www.egmdss.com) which seeks to educate seafarers about the different systems and types of equipment in use.

In 1988, the IMO added the Global Maritime Distress and Safety System (GMDSS) requirements to the International Convention for the Safety of Life at Sea (Solas). These requirements entered into force in 1992, and were phased in gradually until 1999. This was an extremely significant development. It offered far more flexibility and features than the old-fashioned signalling lamp, Morse code, and International Code of Signals.

The basic concept of the GMDSS is to alert search and rescue operations ashore of incidents, and to inform ships in the vicinity with minimum delay. This results in well-coordinated search and rescue operations. The IMO made this system compulsory for all convention ships (ie a cargo ship of 300 gt or over and all passenger vessels). These vessels must be able to send or receive distress calls by two independent means, automatically, to a rescue coordination centre. The IMO also made it compulsory for all seagoing personnel operating a VHF radio system to be qualified to a minimum standard (GMDSS SRC short range certificate level).

The introduction of digital selective calling (DSC) to VHF radio sets made it possible for vessels to send digital codes containing their identity number automatically, and generate distress alerts that contain their position. A typical nine-digit maritime mobile service identity (MMSI) number is programmed into DSC equipment. This number acts like a direct

dialling telephone number. In the event of a distress situation, a dedicated DSC button makes the equipment automatically send the MMSI number and the position of the distressed vessel (provided the DSC is linked with the vessel's GPS receiver).

GMDSS regulation

Marine radio operators must display the basic knowledge of GMDSS instruments to obtain a professional licence, which will ensure that they are able to operate the system as required. IMO has made it compulsory for all seagoing personnel operating a GMDSS radio system to hold a GMDSS operator's licence.

In the UK, according to the GMDSS regulations governing the use of maritime radio, it is an offence to install or use any radio equipment on board without obtaining a radio licence first. Ofcom, the UK government's independent telecommunications regulator, has the power to confiscate unlicensed equipment and prosecute the owner for non-compliance with regulations.

All radio equipment must meet certain requirements. It is mandatory that equipment installed in the ship must avoid any interference with other equipment and operate correctly as required by the regulation. It is also required to renew the licence annually. Under the GMDSS regulation, all merchant ships must carry radio equipment, depending on the area in which they trade. The world has been

divided into four areas. Area A1 is within the range of shore-based VHF coast stations fitted with DSC (20-30) miles. Area A2 is within the range of shore-based MF coast stations fitted with DSC (100 miles). Area A3 is within the coverage of Inmarsat satellites between (70° N and 70° S). Area A4 is situated in the remaining sea areas using HF DSC.

GMDSS is intended to standardise communications equipment and procedures across all sectors at sea. As stated, that means that all people who operate marine radio systems around the world (including merchant navy personnel, yacht crews, sailing boat skippers and port and harbour workers) need to be qualified to operate the specified equipment. All mariners must, therefore, obtain the appropriate type of GMDSS certificate. However, access to the required knowledge is limited, since traditional vocational education and training (VET) is expensive, and distance learning is not often feasible.

To address the need for readily available GMDSS training material, 11 major European maritime education and training organisations, universities and businesses based in nine countries came together to launch an online GMDSS training course called EGMDSS.

EGMDSS initiative

The EGMDSS project partners agreed that the courses should be straightforward and clearly laid out. They also agreed that they should be available free of charge, and at any time or place. Against fierce competition, the partnership secured EU funding for the development of the software. The fruit of the partnership's labour is now helping thousands of seafarers to access free training materials. Because the EGMDSS project partnership includes such a broad range of different nationalities, the partnership has been able to make the courses available in more than nine different languages, including English, Slovenian, Greek, Turkish, Italian, Polish, Finnish, Spanish, and Dutch, which has substantially increased its appeal; and

it has encouraged a standardised approach for short-range certificates (SRC) and long-range certificates (LRC).

EGMDSS initially developed SRC courses. It achieved substantial success and recognition within the maritime community and further support was secured from European Union for the EGMDSS-VET project. A core element of the new project was the LRC course. This benefits radio operators on vessels which are fitted with MF/HF radio or satellite equipment, which includes many small commercial and recreational vessels not covered by the Solas Convention.

EGMDSS is a major breakthrough: it provides a remarkable opportunity for seafarers to get free online GMDSS training. Users can access training materials and take on-line tests (which produce score reports) to assess their knowledge. They can then apply what they have learned by using realistic GMDSS equipment simulators. The modular courses also include animations.

At the 'Towards eGMDSS' seminar organised by the Royal Institute of Navigation in March 2010, Dr Martin Ziarati (Director of Centre for Factories of the Future, a partner in the EGMDSS-VET project) pointed out that as equipment changes and becomes more complex, there is a greater need for training. EGMDSS helps seafarers to refresh their knowledge, or become more familiar with GMDSS theory and equipment. The online course sets out to describe the GMDSS in detail, and shows with the help of realistic

simulators how to use all the radio equipment required by the system.

In order to obtain a mandatory professional short-range certificate, a candidate must be able to operate the different types of GMDSS communication devices correctly and competently, in accordance with international agreements for the safety of life at sea.

Short-range course (SRC)

■ VHF digital selection calling (DSC)

This equipment is for initiating ship/ship, ship/shore, and shore/ship radiotelephone and MF/HF radio telex calls. DSC calls can also be made to individual ships or groups of ships. DSC distress alerts, which consist of a preformatted distress message, are used to initiate emergency communications with ships and rescue coordination centres. There are many sophisticated VHF-DSC radios on the market, with a range of different capabilities and functions. The most common features are:

- Shows menu items;
- Displays error messages if incorrect operation is attempted;
- Displays incoming and logged calls; and
- Displays current position if linked with the GPS.

■ Navigation text (NAVTEX)

NAVTEX is an international automated system for instantly distributing maritime navigational warnings such as weather warnings and forecasts, search and rescue notices, and other information to ships. It is a worldwide information system which provides essential information to help

vessels navigate safely. It is now an integral part of the GMDSS. Special equipment comprising a small unit fixed tuned to the NAVTEX frequencies is used to receive information. The information is transmitted in two different frequencies, 518 kHz, and 490 kHz. The 518 kHz frequency is used to transmit navigational and weather warning information worldwide, 490 kHz frequency is used to transmit information in local languages and is primarily for small boats.

■ Emergency position indicating radio beacons (EPIRB)

EPIRB was designed to alert rescue authorities of vessels in distress by indicating a vessel's location. It is a self-contained, watertight, and buoyant battery operated radio transmitter. It is carried on board vessels as a supplement to a marine radio. The purpose of this beacon is to transmit a distress alert and mark the position of survivors in a search and rescue operation. A vessel's EPIRB has a unique, legally registered identification code specific to that vessel. Most types of EPIRB have GPS capabilities, which transmit the exact location of survivors (accurate to 100m 95 per cent of the time) to the rescue co-ordination centre (RCC). The RCC then re-transmits the distress alert to the ships in the vicinity of the vessel in distress.

■ Search and rescue transponders (SART)

These are used to locate survival craft or distressed vessels by creating a series of 12 dots on a rescuing ship's three-cm radar display. At close proximity to the distressed vessel, the dots change into arcs and eventually change into concentric circles. The purpose of this radar transponder is to assist a rescue vessel or aircraft to quickly locate survivors in a search and rescue operation. In general, a SART has a battery life of 96 hours when it is not transmitting, or eight hours when transmitting.

Long-range course (LRC)

Includes the following equipment in addition to those for SRC:

■ MF/HF radio

MF/HF radio allows users to either transmit or receive information by voice and telex using DSC, radiotelephony; and narrow band data printing (NBDP). The operators can generate distress, urgency, safety, and routine communication with other ships and coast stations. The equipment is designated for vessels navigating A2, A3, and A4 areas.



Training the maritime and offshore industries

Radio & Navigation:
ARPA, pre-ARPA, GMDSS (GOC, ROC and LRC) CAA Radio, NaRAST (Operational and Management), Bridge Team Management, SVNR

Merchant Navy Operations (Deck):
Officer of the Watch (unlimited) CoC, Chief Mate/Masters (unlimited) CoC, Master Mariner Orals Preparation (4 week)

Offshore:
Command & Control for ERMV Masters & Mates, CRO Controlling Emergencies, OIM Management of Major Emergencies, Hydrocarbon and Maintenance NVQs, Offshore First Aid

STCW:
PST, PSSR, Fire Fighting, Elementary First Aid (available as 5 day combined), Efficient Deck Hand, CPSC&RB, FRB, Tanker Familiarisation, Specialist Oil Tanker, Ship Safety Officer, Ship Security Officer, Marine Transfer and Capsize Drills

Dynamic Positioning:
DP Introduction, DP Induction, DP Advanced (Simulator)

Medical:
Elementary First Aid, Medical First Aid Aboard Ship, Medical Care Aboard Ship, Offshore First Aid

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Course info and dates
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email: maritime@lowestoft.ac.uk
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Suffolk NR32 2NB United Kingdom

■ Inmarsat C

Inmarsat C is a satellite system used for safety and distress communication in sea area 3 (excluding areas 1 and 2). Coverage of Inmarsat C is reliable from latitudes 70 degrees north to 70 degrees south. Within this system, it is possible to send a distress alert and transmit/receive maritime safety information (MSI). There are more than 100 different models of terminal approved to operate with Inmarsat C.

Professional development

EGMDSS training courses provide a rich and flexible tool for professional development, as well as opportunities for life-long learning online. They encourage the regular refreshing of knowledge and skills required to operate GMDSS equipment. The system provides easy access to essential knowledge about distress, urgency, and safety communication, as well as the broadcast of marine safety information (including navigational and meteorological warnings). The courses cover all aspects of marine VHF radio communication dealing with all the radio procedures and techniques of GMDSS for alert, urgency and distress calls. They are designed for

all seafarers, amateur and professional.

EGMDSS consists of GMDSS, SRC and LRC online courses with tutorials for VHF, EPIRB, SART, NAVTEX, Inmarsat, MSI, EGC, and MF/HF. The following simulators are also featured: VHF radio (Simrad RD68), MF/HF radio (Thrane&Thrane Sailor CU5100), Inmarsat C (Thrane&Thrane Sailor TT-3020, SAILOR TT-3606E), NAVTEX receiver (McMurdo NAV 6 plus). The buttons and functions on the online VHF radio simulators can be used, just like using the real piece of equipment. For end-users, it is free to sign up and use the tutorials to either refresh their memory, or revise for a test.

The courses will support those who are learning about the subject matter for the first time, or those who are just refreshing their knowledge or preparing for the SRC / LRC examination. The website's ability to assist GMDSS learning throughout the world by supporting learning in nine languages increases the learning tool's international appeal.

From an amateur sailor's point of view, this course could save lives in distress or emergency situations at sea. Many yachtsmen have, at some point, been in an emergency situation and realised that they

wished that they had attended a course to learn some basic knowledge of the different types of equipment on board the sailing boat. At least by going through this self-learning and self-assessing EGMDSS course, basic understanding of such equipment can be obtained.

For the future

The EGMDSS website has gained more than 27,000 registered users within a short time. It is currently being offered free of charge to GMDSS training providers, who are now able to customise the platform for their own use by putting their official logo on the tutorials, and adding / removing sections of content to suit their own needs.

Supported by the EU, EGMDSS aims to encourage life-long learning, and to maintain and update the level of professional knowledge and skills of seafarers, which in turn helps to improve safety at sea through better vocational training and qualifications. It is a major breakthrough.

■ You can try all of the courses free at www.egmdss.com.

If you are a GMDSS training provider who is interested in learning more, please contact info@c4ff.co.uk