

E-LEARNING OF COMMUNICATIONS AT SEA - PROJECT E - GMDSS

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SUMMARY

Maritime communications remain crucial, especially in emergencies, when sometimes the nearest possible human being capable of offering help could be miles away. To help make communications at sea more efficient, the International Maritime Organization (Slovenia being a member) has established the GMDSS system, which is obligatory for bigger ships (so called SOLAS ships) and strongly recommended for other ships, such as yachts, fishing boats, recreational craft, etc. All mariners must obtain the appropriate type of GMDSS certificate. Maintaining GMDSS skills is crucial because emergencies at sea occur rarely. Thus, the average mariner, perhaps never actually having been involved in a crisis at sea, requires regular refreshing of the relevant knowledge and skills as well as introduction to advancements and innovations that are necessary to maintain the highest possible level of safety at sea.

The aims of the E-GMDSS project are based on the idea of offering online GMDSS courses to mariners, but the process, we believe, is relevant for any transmission of distance education. The most recent project outcomes are already available on the existent GMDSS e-learning platform (www.egmdss.com), which has more than 23,500 registered users. The paper will present the project from the origin of the idea to the current status of the project.

Key words: E-GMDSS, E-learning, maritime communications.

E – UČENJE POMORSKIH KOMUNIKACIJ, PROJEKT E-GMDSS

POVZETEK

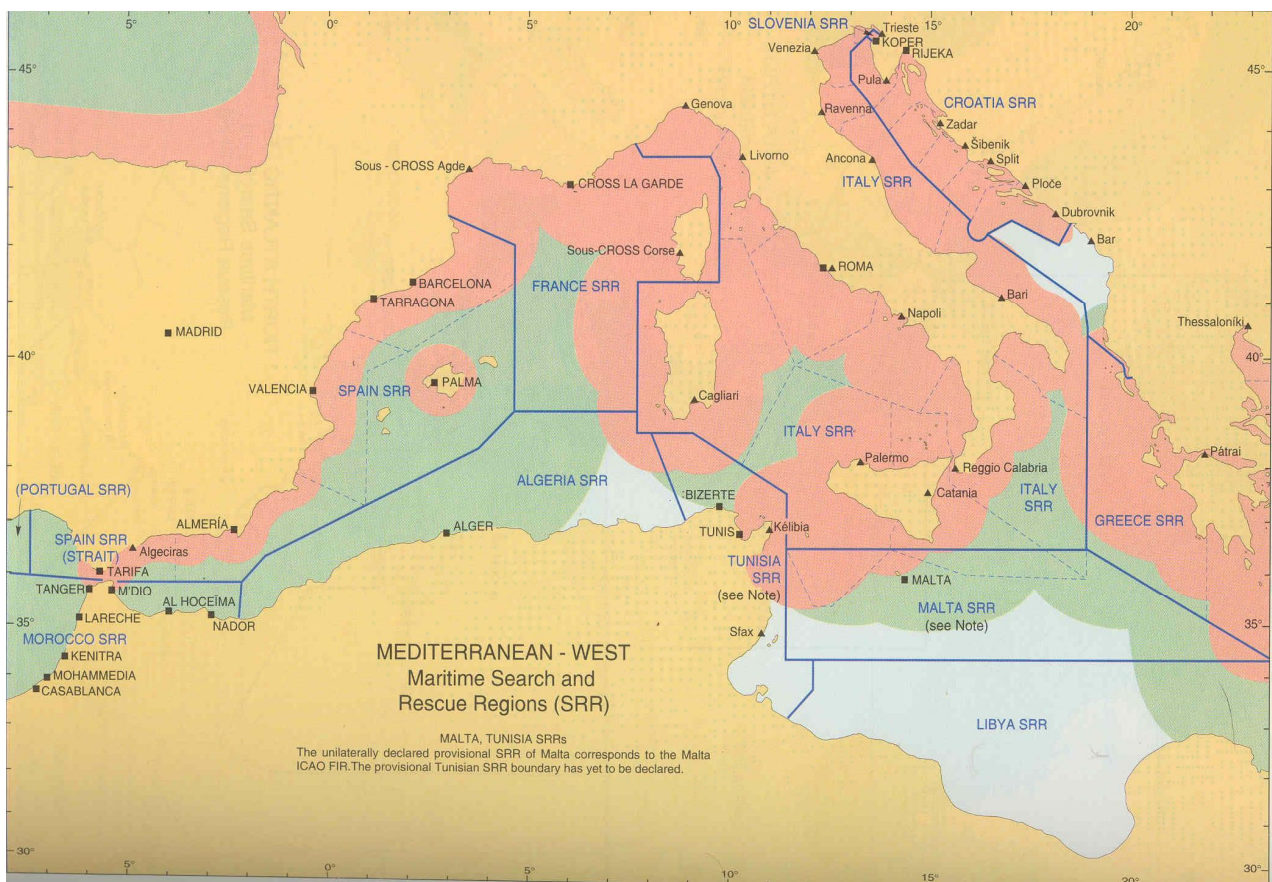
Sodobni svet praktično ne more brez dobrih komunikacij, kar velja tudi za pomorske komunikacije. Na morju pride to še posebej do izraza v kritičnih situacijah, ko je najbližja pomoč oddaljena na desetine kilometrov. Zato je Svetovna pomorska organizacija (IMO), katere članica je tudi Slovenija, uvedla sistem GMDSS, ki je obvezen za večje ladje (tako imenovane SOLAS ladje) in priporočljiv za ostala plovila kot so jahte, ribiške ladje, plovila za rekreacijo itd. Za delo s temi sodobnimi napravami morajo vsi pomorščaki pridobiti njihovi plovbi primerno ustrezno spričevalo pred strokovno komisijo v posameznih državah. Vendar praksa kaže, da kljub temu ustreznemu usposabljanju pred izpitom, nivo znanja čez nekaj časa pade in nemalokrat se zgodi, da predvsem nepoklicni pomorščaki ne vedo kako reagirati v kriznih slučajih. Zato je obnova znanja prepotrebna, pa čeprav ni zakonsko obvezna. Zato so bili idejni cilji pri zasnovi tega projekta sledeči: ponuditi brezplačen GMDSS tečaj on-line prek interneta za vse zainteresirane pomorščake, spodbujati vseživljenjsko učenje in občasno obnavljanje ustreznega nivoja znanja. Dosedanji rezultati še nedokončanega projekta so dosegljivi na internetnem naslovu www.egmdss.com v skoraj vseh evropskih jezikih. Dosedaj je registriranih prek 23.500 registriranih uporabnikov. V članku bo predstavljen projekt od idejne zasnove do trenutnega stanja.

Ključne besede: E-GMDSS, E-učenje, pomorske komunikacije

1. INTRODUCING MARITIME COMMUNICATIONS

To make communication at sea, especially in cases of emergency, as efficient as possible IMO (the International Maritime Organization) has established the Global Maritime Distress and Safety System (GMDSS). GMDSS has been fully implemented worldwide since February 1999 as a part of the SOLAS¹ (Safety Of Life At Sea) convention, specifying the GMDSS communication equipment for marine vessels, and rescue procedures for vessels and humans at sea with the objective of maximizing safety at sea. Non-SOLAS vessels are not always forced to comply with GMDSS radio equipment carriage requirements, but will increasingly do so as more regional rules require that they do so, and also because of the common sense aspect of increased safety. In some cases, though, any extra expense will prove a deterrent to change. The e-GMDSS course, free and online, will help persuade some additional seafarers to comply.

This GMDSS system provides methods and procedures of alerting by radio communication to shore based RCCs (Rescue and Communication Centers) and ships in the vicinity of ships in distress. This Ship to Shore distress alerting enhances the likelihood of quick and efficient SAR (Search and Rescue) operations. All SAR activities are organized by RCC within specified navigational sea areas normally bordering their coastlines (See picture 1).



Picture 1: SAR cones and GMDSS sea areas

2. EDUCATION AND TRAINING IN MARITIME COMMUNICATIONS

Unfortunately not all seamen know how to use GMDSS equipment. Until they do, the goals of IMO regarding safety will fall short. Largely the extant circumstance is one in which the technology exceeds the technician. For example: in the area supervised by Croatian RCC from the years 2000-2003 199 distress calls were sent, but not one using DSC (Martinčić A). In the Shanghai area, from January to October 2003 410 distress calls were received, but only 3 of them properly administered (Qihuang M., Chaojian S.). This appears to be a world-wide phenomenon.

¹ SOLAS – International convention of Safety Of Life At Sea. Its Chapter IV regulate the radio equipment carriage requirements for all cargo ships of 300 GT and upwards and all passenger ships make international voyages, dependent on the GMDSS Sea Area in which they operate.

It is fair to expect that all people working in marine areas - i.e., professional seafarers, fishermen, yacht captains, sailing boat skippers, marina workers, nautical science students/cadets, etc - are qualified to operate the specified equipment and have to hold the appropriate type of GMDSS certificate. These certificates prove that the holder has appropriate competences (knowledge and practical skills). In the maritime sector, operators can hold one of the following radio certificates:

Type of certificate	Required for
GOC (General Operator's Certificate)	SOLAS vessels, operating all around the world,
ROC (Restricted Operator's Certificate)	SOLAS vessels, operating only within Sea Area A1 (in Europe near to the coast),
LRC (Long Range Certificate)	Non- SOLAS vessels, operating also outside Sea Area A1,
SRC (Short Range Certificate)	Non- SOLAS vessels, operating only within Sea Area A1,
VHF DSC restricted radiotelephone operator's certificate (In Slovenia and several other countries)	A certificate similar to SRC that proves only the competence to operate a VHF DSC radio - in some countries it is not recognized.

Table 1: List of certificates

Certificates are issued by national agencies based on examination. Examination (details, practical skills and theory) can vary among countries. Certificates are issued without time limit, except higher certificates (GOC, ROC), that are required on SOLAS vessels which require periodic refreshment.

3. PROJECT ROOTS

Access to required knowledge has been limited to traditional MET, which is not in itself a problem; it's simply a standard educational system. The problem lies in the absolute necessity of long-term seafarers to upgrade their knowledge and skills in a rapidly changing work environment, which is ensconced in a context of ever increasing awareness of needs for improvement in practice (not only better safety conditions, but many environmental necessities as well).

GMDSS educators typically are dependent on expensive computer simulators of GMDSS communication devices without royalty free licenses, and are not generally in a position to provide their services without cost to the learner.

The project consortium gathered by Spinaker², as a reaction to the current circumstances, set out to develop an SRC course using e-learning technology guided by the following circumstances:

- the access to the course should be free of charge,
- the course should include real-life animation of communication device operation (and convey to the learner how such a device operates),
- the course should include communication device simulators (putting a learner into an active role - instead of just answering questions, the learner actively practices and verifies their knowledge on a simulator).

4. PROJECT DEVELOPMENT

The first course was only concerned with the VHF DSC radio system. It was developed in 2005 and it was called "VHF GMDSS course". Initially, it was only available in Slovenian. It was translated into English at the end of 2005. A few months after its issue in English, it was chosen as one of the nine best e-learning resources (selected from a total of 443 resources) in the "My favourite e-learning resources" contest (16.6.2006 - a European Commission initiative "elearningeuropa.info").

Meanwhile, a European project called "EGMDSS" began with the aim of upgrading the VHF DSC course to an SRC course translated into 8 languages. At the beginning of 2006, the consortium applied to the European Union Leonardo da Vinci Community Vocational Training Action Programme calling for pilot projects with 11 partners from 9 countries. In August 2006, the "EGMDSS" project was approved for EU funding.

² Spinaker d.o.o., Sončna pot 8, SI – 6320 Portorož, Slovenia

The SRC course is the result of 3 years work by the Spinaker d.o.o. company. All partners involved in participation through the EU funded end of the project have been involved for 18 months. The SRC course is continuously being evaluated by professionals and now is suitable for:

- preparing a candidate for the SRC (Short Range Certificate) or similar (for example in Slovenia – VHF DSC) examination,
- pre-preparation of nautical students and other candidates for other professional courses,
- refreshing knowledge or
- simply learning how to operate GMDSS equipment.

4.1 SRC COURSE

The main objective of this course is to improve the safety at sea of various seafarers when sailing as a professional (merchant marine officers, fishermen, professional skippers, etc.) or as an amateur on leisure crafts such as speedboats, yachts or sailing boats. The course has as its primary objective the preparation of participants for the SRC (or similar) examination, for which candidates have to apply with the appropriate authority in their country. Also the knowledge and skills should be refreshed regularly for ensuring safety of the crew, passengers and freight (even though this is not necessarily a legal requirement).

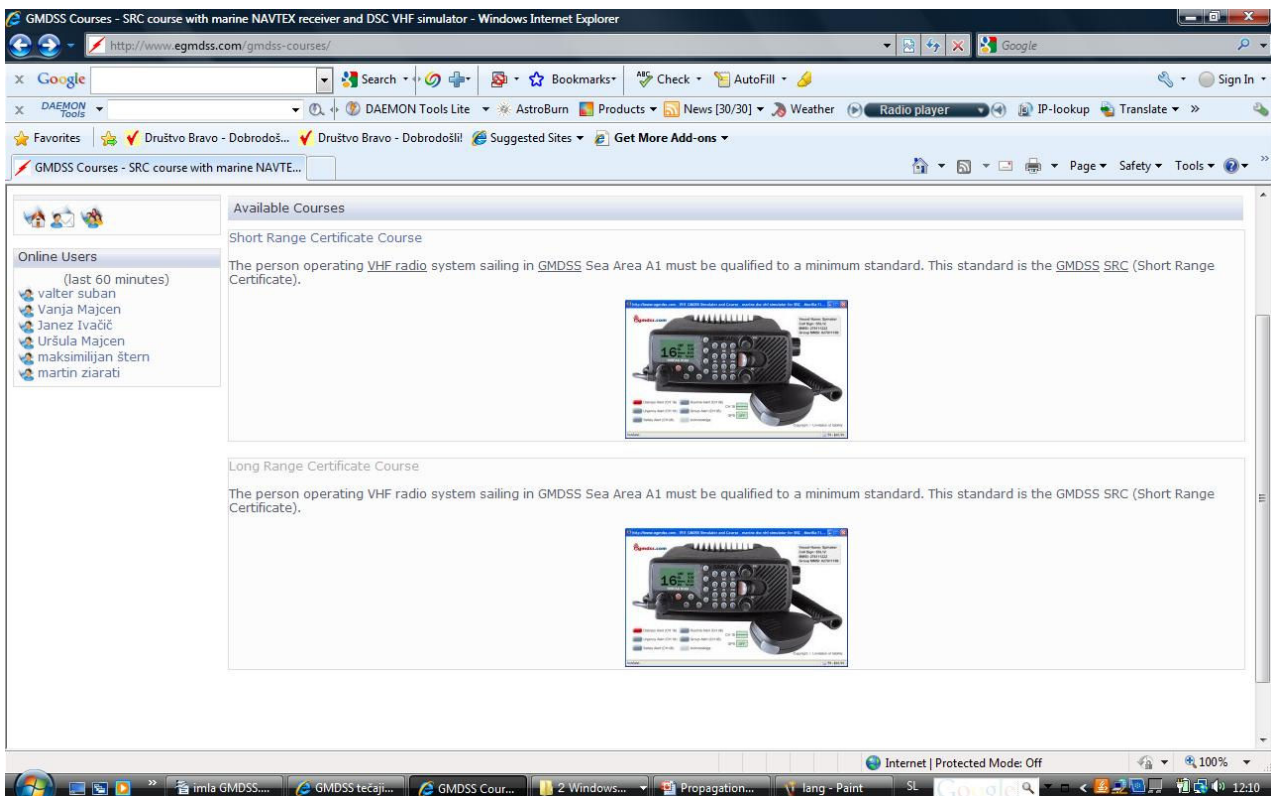
It is for this reason that the consortium has started with the development of an SRC course using e-learning technology and based on the original principles.

The course is now available on line on web site www.e-gmdss.com. The applicants must simply register, free of charge. (The on-line course is currently available in 13 different languages [see picture 2] and more are in the works). The user selects SRC and may begin studying immediately (see picture 3 and 4).



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Picture 2: Available languages



Picture 3: main page

GMDSS ► SRC

Topic outline

- Acknowledgements
- Foreword
- The History of the Course

1 Global Maritime Distress and Safety System

- The basis of GMDSS
- GMDSS Sea Areas
- Certificates of Competence
- Short Range Certificate
- GMDSS quiz

2 Radio communication

- The basis of radio communication
- VHF Channels
 - Uses of VHF channels
 - Simplex and Duplex Channels
 - Transmitter Power
- MMSI (Maritime Mobile Service Identity)
- Coast Radio Stations
- Call Sign
- Phonetic Alphabet
- Procedure words
- VHF radio voice procedure
- Radio communication quiz

Picture 4: SRC main page

4.2 LRC COURSE

The upgrade of the SRC course is a project named “E-Learning system for GMDSS MET³”. Near the end of 2008 EU funding was approved within the Leonardo da Vinci program. (<http://www.adam-europe.eu/adam/project/view.htm?prj=4246>; <http://www.egmdss.com/ldv.htm>).

The aims of the proposed project are related to SRC extension:

- to offer a dedicated e-learning system to GMDSS MET providers,
- to enable them to deliver all GMDSS courses online,
- to offer online GMDSS courses to mariners,
- to encourage GMDSS lifelong learning and knowledge updating to maintain the level of professional knowledge and skills of mariners,
- to facilitate do-it-yourself learning as well as tutoring,
- to facilitate distance learning, and
- to improve safety at sea due to better vocational training/qualification of mariners resulting in lower loss of human lives and material damages.

³ MET – Maritime education and training, the abbreviation for all kind of institutions giving knowledge and skills in maritime fields. The knowledge level varying from institutions given most basic knowledge (i.e. sailing course for beginners) to the universities.

To achieve these objectives, the project is developing a complete online LRC course with all GMDSS communication device simulators needed, because all GMDSS courses overlap with the (already existing) SRC course even if on different knowledge levels. Within the project there will also be an enhancement of the existing GMDSS e-learning system.

4.3 PROJECT PRODUCTS

The project product will be:

1. An improved GMDSS e-learning system, which will:
 - be accessible on the internet website www.egmdss.com (note that the current system is already accessible on the same internet website),
 - include at least the SRC and LRC courses,
 - target all mariners and those people who aspire to become one (several million in EU alone),
 - enable GMDSS MET providers to add all GMDSS courses to the e-learning system,
 - enable GMDSS MET providers to improve any GMDSS course from the e-learning system when needed,
 - enable GMDSS MET providers to use any available GMDSS communication device simulator and any available multimedia content in any GMDSS course,
 - have language support for any language,
 - include a user manual for GMDSS MET providers in English, and
 - have social network elements, at least a forum and chat.
2. An improved GMDSS LRC course, which will:
 - be a part of the GMDSS e-learning system,
 - include GMDSS communication device simulators (MF/HF DSC radio and Inmarsat-C terminal) putting a learner into an active role; instead of answering questions the learner actively practices and verifies his knowledge on a simulator,
 - be available in English, Slovenian, Turkish, Italian, French, Polish, Finnish, Spanish, Norwegian, and Dutch (and possibly other languages),
 - include real-life animation of GMDSS communication device operation (conveying to the learner how a device operates),
 - include separate quizzes for each chapter,
 - be developed considering harmonised examination procedures for maritime radio operator's certificates (CEPT/ERC/RECOMMENDATION 31-05 E) issued by the European Radio communication Office, and
 - be certified with a BTEC vocational education certificate by world renowned awarding body EDEXCEL.

4.4 PROJECT CONSORTIUM

The consortium has many years of experience in GMDSS MET and is able to produce an excellent educational product. The consortium members are aware of the fact that their activities should be well managed because of task distribution among them. They are aware also of the fact that distribution of activities may lead to different levels of quality. Therefore, the consortium has developed a special quality assurance plan. The sustainability of the project is strongly dependent on valorisation activities, so a valorisation plan was prepared with special attention focused on previous research outcomes.

The anatomy of the project as it has evolved is relatively transparent and should be easy to adapt or even copy for a variety of non-maritime, even non-adult (pupils), educational purposes. The basic requirements besides, obviously, pedagogical competence, are financial and motivational. Finance should not be considered in any way an impediment for those with the will to extend learning to those for whom training and education are not available. Schools are generally non-profit organisations set up for the betterment of society, and such a program as ours could easily be set up by a dedicated staff at a school that identifies a fraction of the populace that could be reached through distance learning. (The fact that this is computer based simply requires collaboration with public libraries or other non-profit facilities).

5. CONCLUSION

At the moment the GMDSS system is available to prevent most disasters, and the greater numbers of vessels are in compliance including qualified radio operators with appropriate knowledge, the safer are the seas. The GMDSS MET E-Learning Project takes advantage of the virtually unlimited possibilities available through the internet, providing a standard course more widely available to all kinds of seafarers than any such GMDSS project in the past, and also offers the humblest MET institution a means to reach countless new course participants. The project is an example of how e-learning can be managed to fit a specific need, as well as how an educational project can evolve and continue evolving, to the benefit of any and all desirous of learning, regardless the subject. Finally, as a sort of aside, it is worth

editorializing that any society's industrial and educational components are unlikely to be synchronized over time, and this sort of project is a way to solve the economic/educational problems that naturally arises given the cumbersome nature of institutions..

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