PROJECT E - GMDSS VET

Valter Suban, M.Sc.,Violeta Jurkovič, Ph.D., Rick Harsch, M.F.A, Marko Perkovič, M.Sc.
University of Ljubljana, Faculty of Maritime Studies, Pot pomorščakov 4, Portorož, Slovenia
Contact: valter.suban@fpp.uni-lj.si, tel +38641-211848, fax +3865-6767295

Tomaž Gregorič, M.Sc.
Spinaker doo, Portorož, Slovenia
tomaz.gregoric@spinaker.si

Communications at sea are crucial today as much as ever with traffic generally on the rise, incidents on the rise, and the likelihood of the nearest help being far away. To make communications at sea efficient, the International Maritime Organization, Slovenia which is a member of, has established the GMDSS system, which is obligatory for bigger ships (so called SOLAS ships) and strongly recommended for other ships, like yachts, fishing boats, recreational crafts, etc. Not only professional ship's officers, but also people working in other marine areas – i.e., seafarers, fishermen, yacht captains, sailing boat skippers, marina workers, nautical science students/cadets, etc. - must be qualified to operate state of the art communication equipment at sea. However, access to the required knowledge is limited, and in general regular refreshing of knowledge or lifelong learning is not encouraged. Keeping those skills up-to-date is crucial because emergencies at sea occur rarely and so emergencies are not 'available' for regular practice. The aims of the GMDSS e-learning project are 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, etc. The most recent project outcomes are already available on the existent GMDSS e-learning platform (www.egmdss.com) which has more than 24,500 registered users. The formal consortium members have many years of experience in GMDSS MET and accompanying issues. The partnership comprises 12 members from 10 countries including 6 universities. The paper will present the current status of the project and its deliverables that could be used by any educational and training institution.

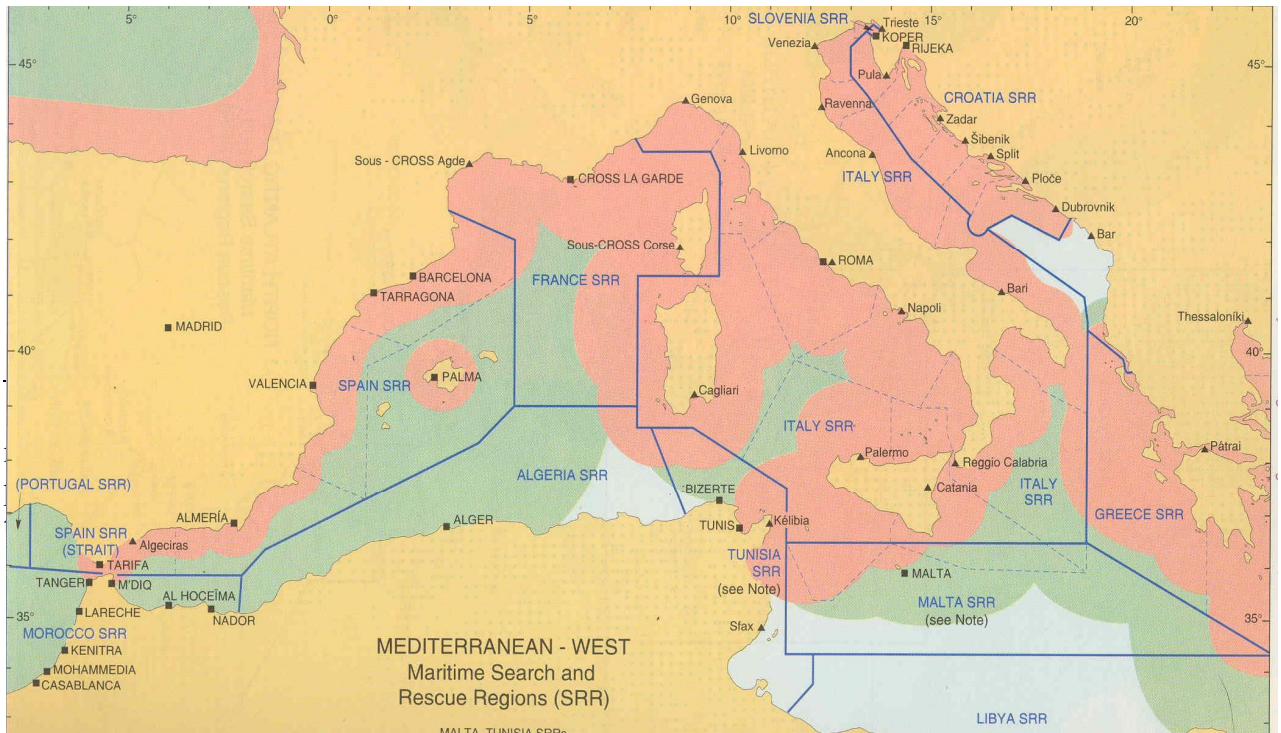
1. INTRODUCTION TO MARITIME COMMUNICATIONS

The first regulations on maritime communications were established already in 1906 at the International Radiotelegraphic Conference in Berlin and came in force in the middle of 1908. Since then, for the next 91 years the SOS has been the standard distress call on ships. But without an experienced radio operator, the system could not work. Even with a radio operator on board the system was not always effective. For example, the Titanic sank on her maiden voyage after a collision with an iceberg. Only 700-odd people were saved, thanks mainly to the efforts of Titanic's two radio officers, who managed to summon help from nearby vessels. However, some 1500 people were killed because the vessel closest to the disaster (the Leyland liner Californian) could not be summoned as her radio officer had just gone off watch after 12 hours on duty.

To improve efficiency of communication at sea, especially in cases of emergency, the 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 SOLAS[1] (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.

The equipment is no longer operated by professional radio officers, but by appropriate qualified professional seamen, normally navigational officers. 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 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 (Martinčič 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.

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 for the higher certificates (GOC, ROC) 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 Spinaker[2] , as a reaction to the current circumstances, set out to develop an SRC course using e-learning technology guided by the following circumstances:

- access to the course should be free of charge,
- real-life animation of communication device operations (and conveying to the learner how such a device operates),
- inclusion of communication device simulators (putting learners 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 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) 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.

The SRC course is the result of 3 years work by the Spinaker d.o.o. company. All partners involved 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

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

- simply learning how to operate GMDSS equipment.

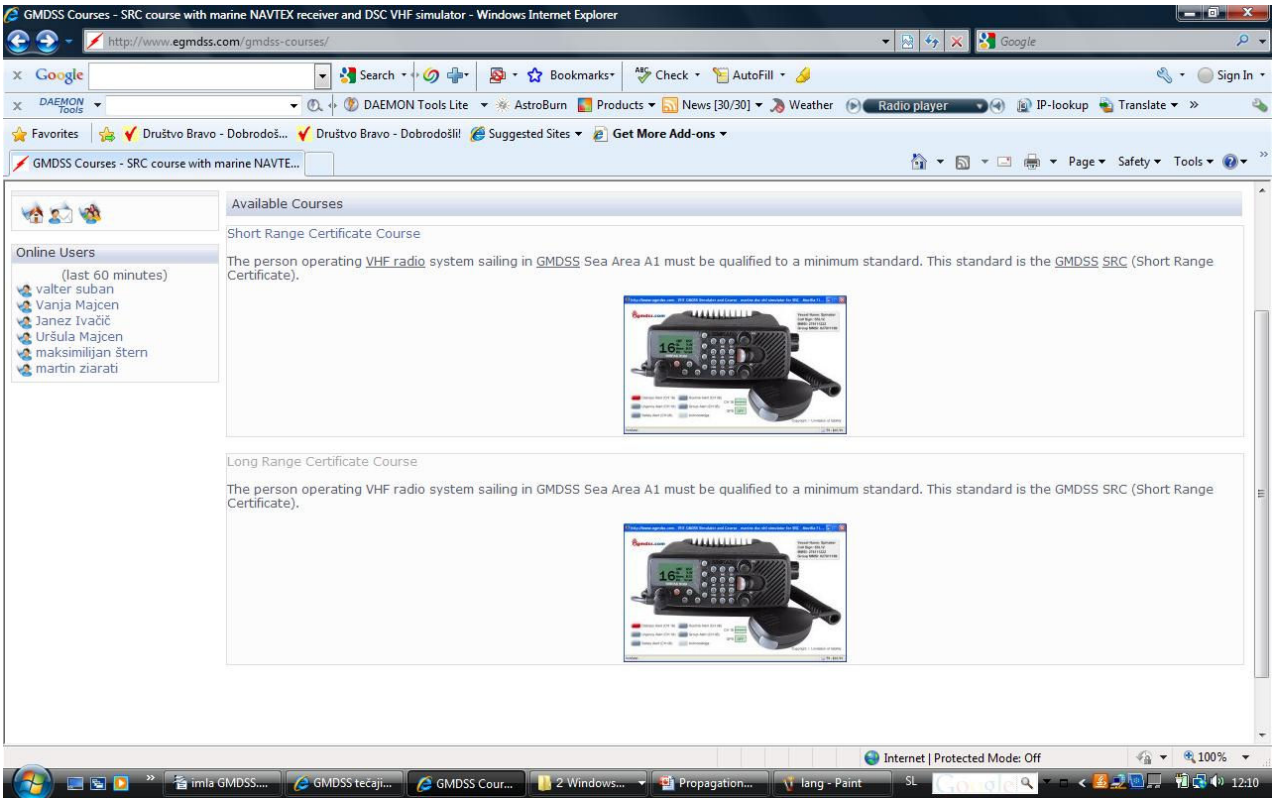
4.1 SRC COURSE

The main objective of this course is to improve the safety at sea of various seafarers when sailing as a professional, or an amateur on leisure crafts such as speedboats, yachts or sailing boats. The course has as it primary objective the preparation of participants for the SRC (or similar) examination, for which candidates have to apply to the appropriate authority in their country. Also the knowledge and skills should be refreshed regularly.

Picture 2: Available languages

It is for this reason that the consortium 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 the 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).



Picture 3: main page

Picture 4: SRC main page

4.2 LRC COURSE

The upgrade of the SRC course is a project called "E-Learning system for GMDSS MET[3] ". 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,

[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 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.

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.

The LRC course consists of 10 chapters and a glossary, in which the applicant receives the knowledge regarding how to deal with the most common equipment on board non-SOLAS ships. Depending on the area where they sail they have on board: VHF DSC station for area A1 (see picture 1, area painted orange), MF DSC radiotelephony station for area A2 (see picture1, area painted green) and HF DSC station or Inmarsat C satellite station for area A3 (see picture1, area painted blue). Besides this on board are also apparatus as NAVTEX and EGC for receiving important information related to safety. Finally there are EPIRB and SART, which are essential in cases of abandoning ship.

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 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, 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).

4.5 PROJECT STATUS

All activities have currently been done according to the timetable. The working version of the project is almost completed and is now (March 2010) in the process of internal evaluation. The project will be translated into the languages mentioned and be preliminarily tested using selected testing groups.

As per plan the final version will be completed by December 2010 and then will be available for anyone free of charge.

5. CONCLUSION

At the moment the GMDSS system is available to prevent or help relieve 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.

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