

The Development for this month is selected from a recent paper presented at the IMLA conference in Croatia last month. The paper emphasizes the importance of event simulation in developing programmes for Maritime English.

Building Maritime English by Event Simulation

A.Sihmantepe, S.Sernikli and Reza Ziarati

TUDEV Institute of Maritime Studies, Tuzla, Istanbul, Turkey

asihmantepe@yahoo.com, ssernikli@gmail.com and rziarati@tudevedu.com,

Abstract

Bridge and engine-room simulators offer a variety of training opportunities for cadets and seafarers of various types and ranks. They basically aim to develop the trainee's competency level in bridge and/or engine-room operation and management as well as helping to enhance the quality of education and training of seafarers. These simulators as well as helping to develop competence in use and/or management of the bridge or engine-room naturally help in improving the communication practices as well. However, there is often the case that communication is being a secondary issue or an unintentional outcome of bridge or engine-room training. As most Maritime institutions have only one to two of these simulators and considering the cost of running these facilities, communication and language training often takes place in classrooms or language laboratories. Research has shown that communication failures are as much responsible for accidents and incidents at sea as navigation errors and engine stops.

This paper focuses on training of merchant navy cadets, for enhancing their communication skills in on-board emergency situations which would help prevent future accidents due to communication failures. The basic aim is to discuss how simulators and simulations can be incorporated in the learning process to prevent communication failures. The study intends also to put forward the advantages of simulations in which trainees are allowed to make mistakes in a safe learning environment.

The study presented here makes references to CAPTAINS (Communication and Practical Training in Applied Nautical Studies), which is an EU funded Leonardo Transfer of Innovation project that aims to make a significant contribution to maritime education and communications training by incorporating state of the art technology, including 2D/3D virtual and interactive simulators.

The paper will also present outcomes of a communication training session conducted in a bridge simulator in which IMO SMCP phrases were practised in a 'building-up' manner through a passage scenario.

Keywords: Maritime English, Cadet Training, Communication, CAPTAINS, Simulators, Simulation

1. Introduction

Over 75% of ships are now multilingual. The vast majority of maritime accidents are attributable to human factors, of which communication failure represents one third. The International Maritime Organisation (IMO) has underlined effective communication as a crucial issue for marine safety (IMO MSC, 2006). This retroactive identification of the communication issue has reiterated the need for improving common language to facilitate safe communication. For English is recognised as the 'language of the sea', provisions to meet this need have covered variety of efforts. Maritime English, as supplementary to general English, can be defined as the operational language, with its specific area and terms in which a term is not only a language unit but also represents a notion of the maritime world. SMNV (Standard Marine Navigational Vocabulary), IMO SMCP (Standard Marine Communication Phrases), IMO Model course 3.17 has been among the major efforts to contribute improving and standardising Maritime English worldwide. European projects like Mareng and MarTEL are other collective approaches to help facilitating improvement and standardisation of Maritime English. However, tools for implementing communicative language training in the context of real-life situation on board are not readily available to maritime education and training (MET) institutions.

Making use of available simulators and creating computer based new simulations with interactive and communicative approach may be a step forward. This will help accustom seafarers to real-life on board communications by using maritime aspect of English language hence reducing the number of accidents due to communication failures.

2. Simulators

Simulation in broad terms can be described as; creating particular conditions that exist in real life by using computers and models. Modern training simulators are designed to provide lifelike experience to trainees. They get as close as possible to real life behavior, appearance, senses, etc. therefore enabling their subjects to experience what is happening as if it were real.

In maritime world, modern bridge and engine-room simulators are designed to offer variety of training opportunities. They basically aim to develop the trainee's competency level in bridge and/or engine-room operation and management as well as helping to enhance the quality of education and training of seafarers.

2.1. Bridge Simulators

Bridge simulators focus on ship handling, bridge team management and bridge equipment training like ARPA / RADAR, ECDIS, AIS etc. The training scenarios may cover a wide range, from passage monitoring to docking practices with some prompt injections on the scene. These simulators as well as helping to develop



competence in use and/or management of the bridge, naturally help in improving the communication practices as well. However, there is often the case that communication is being a secondary issue or an unintentional outcome of bridge training. Focusing directly on the bridge equipment and navigation competency may set covering every aspect of the bridge communication needs back, unless special sessions for communication training are arranged. When in transit, bridge communication needs broadly covers; ship-to-ship, ship-to-shore VHF communications, exchange of information within the bridge and the internal communications with the engineering officers and the engine control room.

2.1. Engine room simulators

These simulators cover a range of engine configurations and propulsion systems. They contain all main systems and auxiliary systems with controls indicators, valves, alarms, etc. In addition, these systems incorporate many graphic status diagrams and read-outs.



Besides helping to develop competence in use and/or management of the engine-room, these simulators allow trainees to be assessed automatically by introducing various fault situations. However, concentrating on smoothly running the engines and auxiliaries and injected faults, the communication end is generally left out. In real life, there needs to be a constant information flow between the engine control room and the bridge, especially in times of engine or

auxiliary failures. Actually this is a two-way need; especially when navigating under restricted conditions like low visibility and TSS passage, a fully clear and comprehensible communication should be maintained between the bridge and the engine control room to facilitate evasive manoeuvres and sudden speed changes.

3. Duty cycle and communications routine of merchant ships

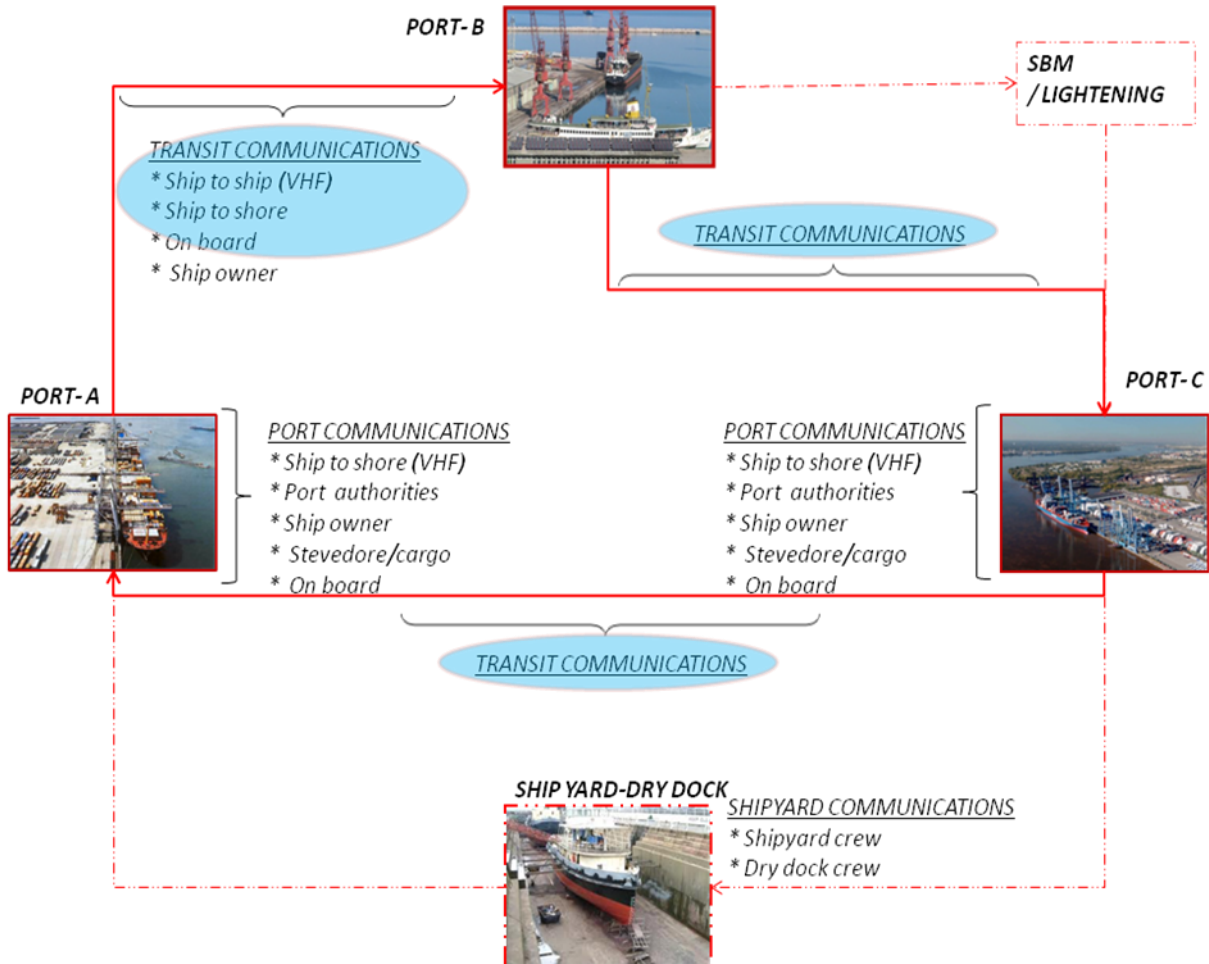
Before discussing how simulators and simulations can be utilized in enhancing maritime English and hence maritime communications training, it is deemed beneficial to make a quick review of the communication routine of the merchant ships in their duty cycles. As per its definition, communication covers the whole range of verbal, non-verbal, expression of ideas and feelings, for the purposes of this paper, the focus will be directed mostly on the operational side of the maritime world, which is speech communication. Other elements which play role in effective communication, like cultural differences, non-verbal communication, gestures etc. will not be included within the scope of this study due to the diversity of assets required. (However, noting that the maritime working environment is multinational, differences in accents will be mentioned briefly.) .

3.1. Duty cycle of merchant ships

General Duty cycle of merchant ships starts with cargo loading and securing operations. Safely navigating to port of destiny is the second phase of the duty cycle. Arriving in and discharging the cargo at the port of destiny completes the cycle. However, depending on the type of the ship, this cycle may have additional phases like, SBM (Single Buoy Mooring) or “lightening” operations before entering the destination ports. SBM is basically used by tankers as single point mooring (SPM) in which the ship is moored to a buoy anchored offshore. The buoy also serves as a connection point for tankers for loading or

offloading gas or fluid products. Lightening can be described as transshipment of cargo from one vessel to another.

A sample duty cycle and communication routine of merchant ships is shown in the figure below.



A sample duty cycle and communications routine of merchant ships - TUDEV

Auxiliary and passenger ships may have slightly different duty routine than the one shown in the figure due to their operational requirements. Nevertheless, another phase that is part of the duty cycle of a merchant ship always includes shipyard maintenances and dry docking procedures. Having this variety within their duty cycle, makes it a necessity for the seafarers to cope with variety of maritime English terms and communication needs to perform their duties properly.

3.2. Communication routine

The communication routine of a merchant ship can be separated into three basic parts for analysis purposes: Port communications, transit (navigation) communications and the others (like SBM, Lightening and shipyard/dry-docking). Since SBM, Lightening and shipyard/dry-docking communications are considered to be too technical

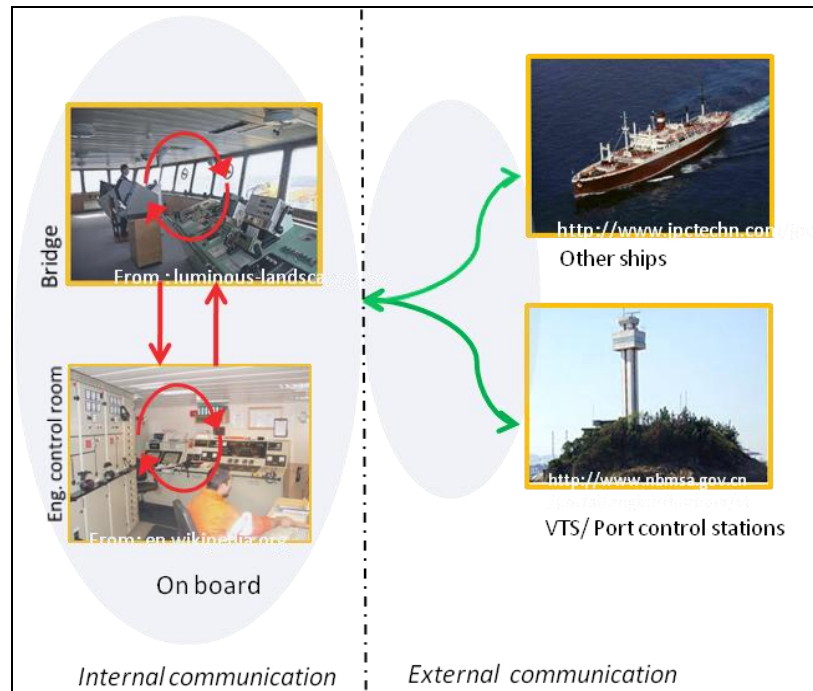
/specialised to practise in a MET Institution's simulator, they will not be covered in the course of this paper.

The figure below is a simple comparison of communication needs of merchant ships at port and while in transit. Communications for cargo operations (stevedores etc.) and communication with the port authorities (port state control, harbour masters etc.) seem hard to simulate due to the diversity of issues, cargo types and methods used for loading /discharging.

<i>Port Communications</i>	<i>Transit/Navigation communications</i>
Ship to shore(PCS)	Ship to shore (VTS/PCS,etc)
With the port authorities (PSC/admin)	Ship to ship
With the ship owner/agent	With the ship owner
On board	On board
Stevedore/cargo	

A sample communication needs comparison - TUDEV

Obviously communication with the ship owner/agent does not require any simulation. It is mostly performed by the masters and chief engineers of the ships by plain English. So, including these in some kind of simulation might be a far goal for the present. However, common areas like ship-to-shore and on board communications can be covered within well-rounded scenarios. This short analysis leads to the fact that presently available simulators can best be used for transit/navigation communication needs which cover ship-to-shore, ship-to ship and on board communication aspects. The figure below shows communication routine of a merchant ship when navigating between two ports.



Communication routine of merchant ships while in transit – TUDEV

The navigation communication routine requires that, together with external VHF communication with the shore stations and the other ships in the area, continuous communication must also be established between the bridge and the engine control room throughout the voyage. Additionally, clear and comprehensible verbal communication within the bridge and engine control room must be sustained for safe navigation of the ship. The crew must be able to perform operational communications clearly, like handing over the watch, reporting faults, contacts and incidents etc.

Realisation of all these can be done within the simulators by conducting special communications/maritime English training sessions in parallel with the professional competency training. Supporting conventional classroom lectures with special simulator sessions will help enhance the level of maritime English and familiarise the trainees with the real life communication routines. Before discussing main points for preparing special maritime English training sessions, we will have a quick review of the benefits of simulations and recent efforts to create new simulations for enhancing maritime English and meet the communication needs of seafarers.

4. Learning through simulations

4.1. Classroom versus simulator

Classroom teaching doubtlessly establishes the main step of teaching/learning process. Giving the basics of the subject matter, explaining the basic dynamics and fundamental theories and teaching the ways to follow the relations among the subjects can easily be realised with the presence of a teacher and a learner group. Direct communication in a classroom also contributes to learning/teaching process by availability of both sides. This is how the schools try to prepare their students for life outside the classroom. However, when professional maritime education comes on the scene, there seems to be a large gap between the safety of an enclosed learning space and the diversity of the life and experiences that exist outside of the classroom. This is where simulators and simulations come on the stage.

A true simulation has a specific goal in mind: to simulate a real system so that the learners can explore it, perform experiments on it, and understand it before implementing in the real world. Utilising the knowledge gained through exposure to simulation is the main purpose of simulation education. Simulations make imitated situations available to the learner to practice and perfect necessary skills, rather than having them set off right into real experience. Simulation may comparatively be better than experience because they compress time and remove elements which are not on the subject. Simulations are optimised for learning as they provide a focused learning experience, where skills, process and knowledge can all be enhanced in a way that reality cannot. The opportunity to explore, experiment and repeatedly apply this knowledge to model situations makes simulation the most versatile form of learning. Today with development of the new technology, computer simulations make this type of learning more effective than ever. What makes training with simulation more attractive is the possibilities it presents to learners. Firstly, simulations reduce boredom, sustain motivation for long periods of time and promote the transfer of acquired skills (communication included) to the real world.

The learners, by achieving success quickly, build their self-confidence and maintain their motivation and interest. Especially with task-based scenarios, which are highly relevant to their personal and/or professional lives, they come to enjoy the knowledge they acquire. Being able to compress the time, practising the scenarios at different difficulty levels are among the basic benefits of simulation training. Simulations also allow the training to actually be fun by giving the learners chances to repeatedly apply the knowledge gained by simply rewarding them after a correct decision. So, how can effective maritime communication skill be built by making use of simulators?

Modern bridge and engine room simulators, primarily aim to increase the professional knowledge and competency levels of the trainees in using and/or managing of the bridge or engine-room. As explained above, today communication is an integral part of safe navigation of the ships. Thus, enhancing maritime English for effective communication must be an integral part of simulator training, seeing that communication failures are as much responsible for accidents and incidents at sea as navigation errors and engine stops. Integrating maritime English training into simulator sessions requires a well established level of co-ordination between the simulator instructors and the instructors of maritime English. Having clear-cut communication scenarios in hand will surely enhance the quality of training. Depending on the level of the trainees, the communication scenarios may be set to fit into already running simulator scenarios. When necessary, special and simplified stand alone communication scenarios may be used give the trainees opportunity to prepare themselves for future more advanced scenarios.

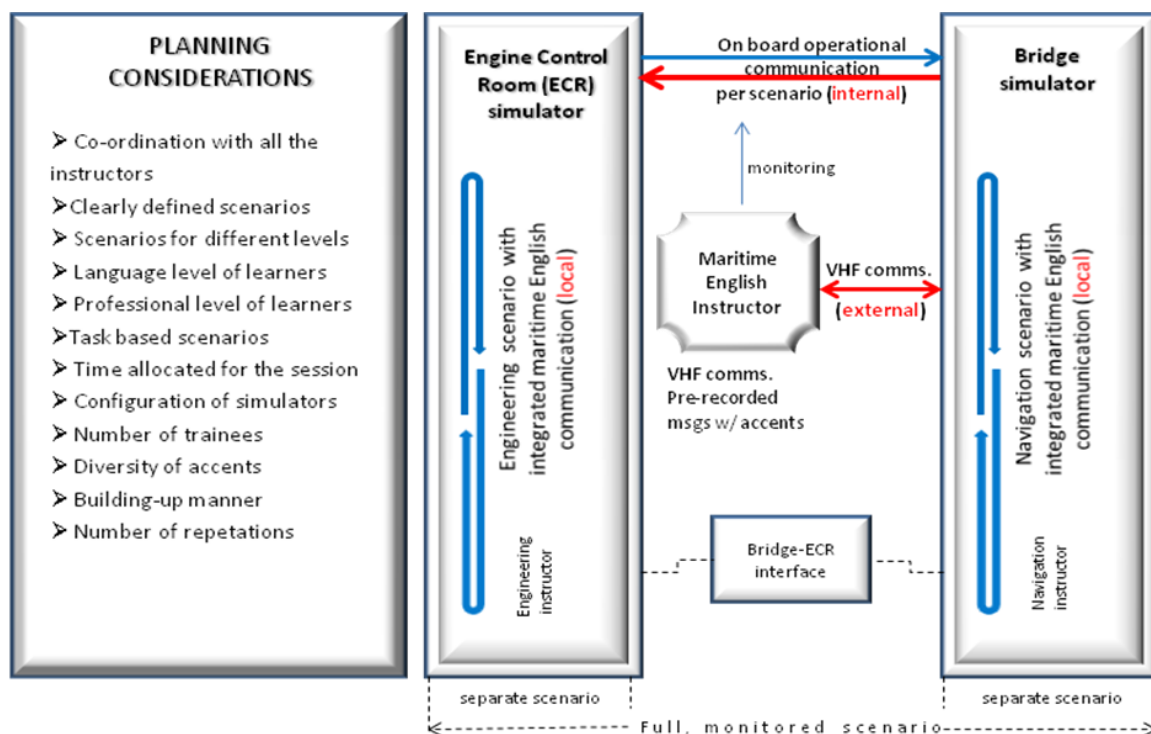
4.2. Implementing simulator usage in language training.

Preparing maritime English/communication training sessions to be practised during simulator session starts with good planning and well- established co-ordination between the different units of a MET Institution. The configuration and setting of the available simulators also play a great role in preparing scenarios for maritime English training with simulation. Another important factor is the level of trainees both from professional and linguistic point of view. This is very important because learning/ using any maritime English term or phrase requires having a certain level of general English beforehand. Further, the professional levels of the trainees need to be considered as well. For example, in a possible collision or near miss scenario during a bridge training session, the learner is supposed to perform the correct communication for preventive or evasive manoeuvres. Expecting a trainee who has not yet been trained on colregs to conduct the right communication, would not be fair as chances for

him/her to succeed would be very low. Moreover repeating the scenario will not help much due to lack of professional knowledge.

At the planning stage one important thing to be kept in mind is the fact that maritime English level goes in parallel with the professional background. A solemn shortcoming that could be experienced while maritime English/communication training in simulators may be the lack of diversity in accents. In real life, the trainees will be working with seafarers from different nationalities who will have different accents. It will be part of their daily lives to communicate with people from different nationalities both for on board and external communication aspects. Having variety of different accents in a national MET institution could be the shortcoming, but this difficulty may be overcome by a little international co-operation and pre-recorded dialogues/messages to train the ear. So how should we plan and conduct maritime English/communication sessions in simulators. Basic concern seems to be the preparation of communication training scenarios to meet the needs. The difficult part lies when it becomes necessary to fully integrate the communication scenarios with the existing navigation/engineering scenarios. Technically it is not a must to begin with. For a start, separate communication scenarios may be produced both for engineering and navigation purposes. The figure below shows a sample set up for conducting simulator sessions to practise on board and external communications. The set up will vary according to the number and type of simulators, availability of ECR (engine control room) and bridge simulator interface and availability of internal and external communication equipment.

As discussed earlier in section 3.1., setting simulator sessions for maritime English/communication will include only transit/navigation communication needs which cover ship-to-shore, ship-to ship and on board communication aspects.



A sample set up for conducting simulator communication session – TUDEV

The first step can be the process of creating a series of communication scenarios in parallel with the information provided in other classes of profession. Basic scenarios may include simple exchange of information and reporting routines. The IMO SMCP establishes a very versatile ground for this purpose. Depending on the language level of students, further

scenarios of higher levels can be created for a step ahead. After having clear-cut scenarios in hand, enhancing the scenarios or improving the way they are conducted can easily be performed using the feedback from the students. The number of students and the time allocated for each training session are among the factors which have direct effect on the quality of the training. Careful planning should be made to provide each student with enough time for practising. Assessing the success of the students should be made after they are given chances to repeat as necessary and digest the subject matter. Maritime English instructors should co-ordinate all aspect of the scenarios with engineering and navigation instructors before each session is conducted. As the primary lecturer in the field, maritime instructor should monitor the whole communication scenario and when possible should also take actively part in communication activity. Following section gives brief information on a communication session trial conducted on the bridge simulator at TUDEV.

5. A communication trial session

5.1. The routine

Simulator training at TUDEV is an integral part of maritime education both for deck and engineering cadets. The cadets are given opportunities to practise and enhance the knowledge they gain through classroom lectures. Depending on their level, basic communication routines are also included in some sessions. They are mostly planned before the end of semester so that cadets will have accumulated enough knowledge to practice. One other issue to consider is to give the cadets opportunity to have fresh experience before they go on their sea training period.

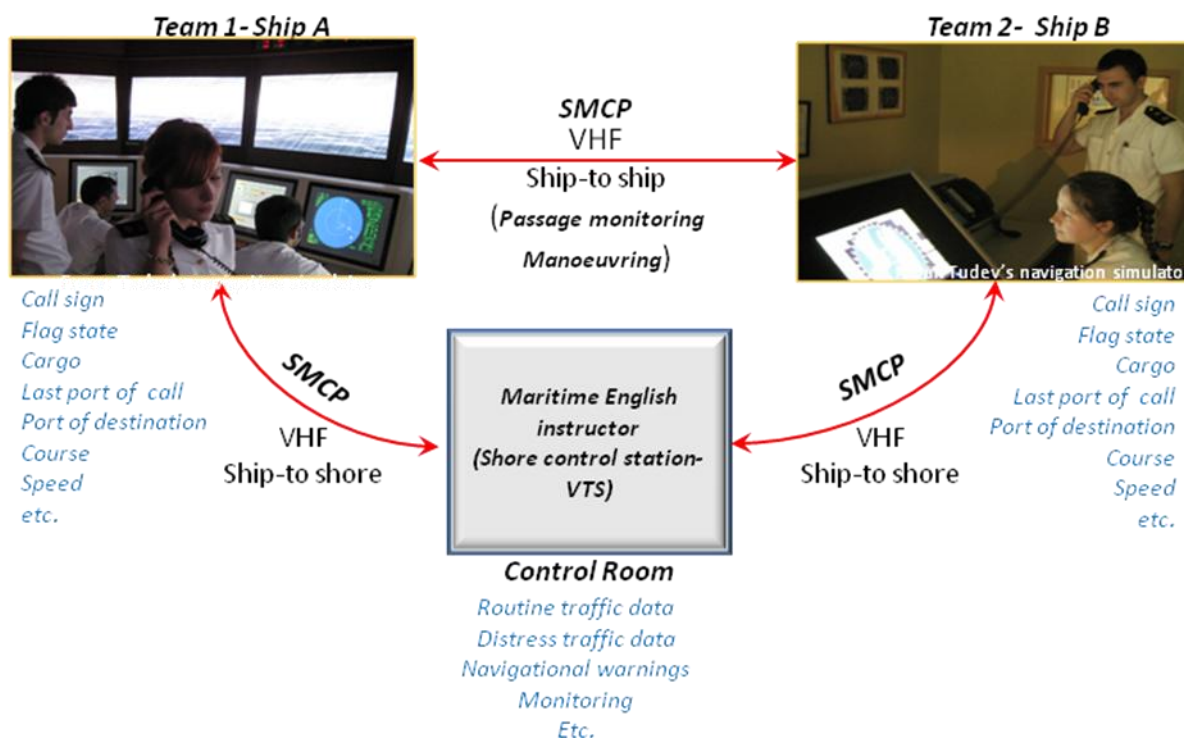
5.2. Preparations

For trial purposes, a special VHF communication session, which primarily based on SMCP usage, was integrated in the navigation bridge training. The target group was composed of the second year deck cadets who had already completed SMCP training and ready to go for their first sea training. In the preparation phase, aims of the communication training were set as much possible as to match the navigation scenario. The aims basically were: a) to practise a variety of VHF voice scenarios, b) to present them in a building-up manner to cover a range from very basics to emergency situations, c) to set the number of repetitions adequately to enable cadets to develop some kind of reflex for properly communicating under tense conditions.

After the aims are laid down, a set of SMCP phrases arranged and distributed to cadets for use as reference during the training. They were briefed on the targets and expected outcomes of the training. It was made sure that they understood that they were expected to abide by the navigation scenario unless instructed otherwise.

5.3. The conduct and feedback

Two separate bridge teams were established in two separate bridge simulators. Three cadets from each team were assigned for running the communication routines. Each team arranged their own job distribution for passage monitoring and manoeuvring by taking turns. Two teams represented two different ships in the same area both within VHF range and the instructor represented the shore control station/VTS.



Communication integrated simulator session at TUDEV

Each team was given all the necessary information like call sign, flag state, ship and cargo type, port information etc. While the two teams sustained communication, the maritime instructor played the role of shore station/VTS and monitored the communications between the two teams throughout the scenario. Cadets from each team were given 15 to 20 minutes to practice their Maritime English. During the course of session, the instructor gave prompt injections which would require prompt responses. When cadets failed to respond correctly, they were given enough chances to repeat and build their self-confidence for the next step.

When the session was over a short post training briefing was held to discuss the conduct and receive the feedback. Instructors observed that the cadets who played the communication role were very hesitant in the beginning. The “voice” through the VHF was found to be the main reason for this. The cadets, while having completed the SMCP training in the classroom, stated that the voice through the VHF, though belonged to their instructor, was made it more realistic as if it was the real world. They all agreed that by time they felt more comfortable and concentrated more on the communication by disregarding the VHF factor. They proved to make good advance after few repetitions and said that they felt more confident and ready for the coming sea training. One setback of the trial was lacking of different accents through the VHF to train the ears of the cadets to simulate the real world of seafaring. Nevertheless, the most pleasing feedback the instructors got after a couple of months was receiving appreciation phone calls from the cadets who were already on their sea training all around the world.

6. CAPTAINS Project

TUDEV, as a partner of the CAPTAINS project, is taking part in the recent efforts to improve communication skills in maritime education by transferring the experience being gathered. CAPTAINS (Communication and Practical Training in Applied Nautical Studies) is an EU Leonardo Transfer of Innovation project which aims to make a significant contribution to maritime education and training. The project is aiming to collate existing knowledge regarding linguistic, paralinguistic, and cultural issues that act as barriers in communication

on board multi-nationally crewed ships, and create interactive online communication training courses for seafarers.

Recent technological breakthroughs in the field of e-learning, and modern communication based learning strategies will be creatively combined to form dynamic new learning tools. State of the art technology, including 2D/3D virtual and interactive simulators, will allow users to interact with the virtual environment in a variety of authentic scenarios, providing the opportunity to ‘learn by doing’. The CAPTAINS project will contribute to an enhanced safety at sea culture by providing a means for seafarers to improve their English language communication skills. The partnership will transfer innovation by combining advanced e-learning and collaboration tools with interactive rich media learning contents, taking into consideration scenario-based and experiential learning.

7. Conclusion

As the labour force of the maritime world will continue to be multi-lingual, the efforts to improve the ‘common language’ will have to take new steps. In addition to conventional classroom teaching, use of modern technology and simulators may contribute a great deal in achieving higher standards in maritime English training. As this will help make the operational lives of seafarers, hence maritime world safer, it will also make their daily lives easier. Using simulators in maritime English training will let the cadets transfer their acquired skills to the real world by practising realistic, extensive inter-personal communications. On the other hand, latest innovative means and methods like the expected outcome of the CAPTAINS project, using 2D/3D animation, will be a step forward for enhancing Maritime English education, hence reduce number of accidents due to communication failure.

References

- Cole C., Trenkner P.,(2008). “*The Yardstick for Maritime English STCW Assessment Purposes*”, Proceedings of IMLA 16th Conference.
- Demydenko N. (2010) _”*International Standards of Maritime English as a Means to Improve Safety at Sea*”, Journal of Marine Technology and Environment, Vol. 1, Constanta Maritime University
- IMO *SMCP (Standard Marine Communication Phrases)*, (2002), International Maritime Organization. London
- IMO Model Course 3.17, 2009, Second Edition, London
- IMO MSC 1/ Circ 1209, 2006, International Maritime Organization.
- TUDEV’s (Institute of Maritime Studies) Simulator records (2010-2011).
- Ziarati R., “*Safety At Sea- applying Pareto Analysis*”, Proceedings of World Maritime Technology Conference (WMTC 06),2006
- Ziarati M., Ziarati R., Calbas B., Moussley L.(2008). “*Improving safety at sea by developing standards for Maritime English.*”, Proceedings of IMLA 16th Conference.
- Web Sites :
- <http://www.novasim.com/what-is-simulation/>
- http://www.atghome.com/simulation_white_paper.pdf
- <http://www.tacticallanguage.com/success.html>
- <http://www.marin.nl/web/Facilities-Tools/Simulators/Simulator-Facilities/Fasttime-Simulators.htm>

Author Biographies

Aydin Sihmantepe

Mr. Sihmantepe, born in 1964 Istanbul/Turkey, he started his maritime career by entering Naval High School/Istanbul in 1978. After graduating from Naval Academy in 1986, he served in the Turkish Navy for 22 years, retiring in 2008. He is holding a master's degree in International relations. He is a lecturer on Maritime English in TUDEV and is involved with EU funded MarTEL, MarTEL Plus and CAPTAINS projects.

Serhan Sernikli

Mr. Sernikli started his maritime career by entering the Naval High School in Istanbul in 1978. After graduating from Naval Academy in 1986, he served in the Turkish Navy for 20 years. Retiring in 2006, he started to teach Maritime English in TUDEV and is involved with EU funded MarTEL, MarTEL Plus and CAPTAINS projects.

Professor Reza Ziarati, BSc (Eng) PhD(Eng) CertEd FIEE FIMechE FIMarEST CEng, CMarEng

Professor Ziarati is the Principal of Institute of Maritime Studies, Turkey, Executive Director of Centre for Factories of the Future, UK, and PhD Supervisor of Several Programmes in the UK. He served as Director of Oxford Brookes University/Dogus Institute, Istanbul, Turkey, Dean of Faculty of Sciences, Head of Department of Computer Engineering and Pro Vice Chancellor (External Relations) of Dogus University. Professor Ziarati is the originator of the MariFuture in the EU and has written several papers on Maritime English relating to a number of projects he initiated and subsequently funded by the EU.