

Saving Migrants From The Sea: Improving Training For Search And Rescue Operations

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ABSTRACT: This paper presents a research in the field of maritime training and education for Search and Rescue (SAR) migrants at sea. This research is oriented to more effective method based on team training for SAR Operations utilizing ship simulation and process of Operational Planning. The training which conducts in cabinets and ship simulators at the Military Academy provides the best results in the optimal application of onboard and emergency/SAR procedures. The training method is in line with all conventions of the International Maritime Organization and models of maritime training courses. The proposed training method can be developed and applied in all schools and centers where seafarers and other Maritime Search and Rescue personnel are trained.

1 INTRODUCTION

After various serious migrant incidents in the Mediterranean Sea in the past years, search and rescue at sea has gained high political attention. (Dijstelbloem, van Reekum & Schinkel, 2017; Cuttitta, 2018; Cusumano, 2018)

The world's most dangerous migrant routes pass through the Mediterranean Sea. Many of these attempts where migrants want to cross the sea have been tragically ended. The Mediterranean Sea is a 'maritime cemetery'. In 2011, according to UNHCR's statistics, more than 1 500 migrants drown or gone missing trying to cross the Mediterranean Sea (Wilkes, ed. Dobbs, 2012). As noted by Brian and Laczko (2014, p. 11): "according to the International Organization for Migration (IOM), in 2014, up to 3,072 migrants are believed to have died in the Mediterranean, compared with an estimate of 700 in 2013". In 2015, over one million migrants crossed the Mediterranean Sea to reach Europe. In 2016 only,

more than 5000 migrants lost their lives in the Mediterranean Sea (Cusumano, 2018). During 2017, at least 3,119 persons died or went missing in the Mediterranean Sea (Albahari, 2018). According to data reports by the International Organization for Migration (IOM), from January to August 2018, 60,309 migrants and refugees have entered Europe by sea and 1,524 people lost their lives on the Mediterranean Sea (International Organization for Migration – IOM, August 2018).

The scale of the flows reached previously unseen levels in 2014 and 2015, as did the number of deaths (UNHCR 2015). In response to the high flows across the Mediterranean, policy has prioritized search and rescue operations and the establishment of maritime patrols.

Migrants crossing Mediterranean Sea: "face the risk of injury and death relating to the nature of the overseas journey, increasingly dangerous smuggling practices, and in some cases, risky rescue operations" (Fatal Journeys, Improving Data on Missing Migrants,

2017). It often happens that many ships and boats during migrants and refugees' transportation occur shipwreck in the Mediterranean Sea. It happens especially because the total number of the lifesaving equipment that is standardized in relation to the capacity of the crew and passengers is not in comply with the regulation.

There are a lot of initiatives and projects for proactive approach to improve safety of migrants and shipwreck problem in the Mediterranean Sea (Tazzioli, 2015; Stierl, 2016). Numerous international and regional organizations are involved in solving this problem of migrants at sea, such as UN, IOM, EU, OSCE, UNHCR etc. Analyzing the data and the huge fluctuation of people who are being transported, especially the large number of victims, important segment of this training is a proper approach and knowledge of all techniques and prescribed measures for SAR operations.

Members of the Armed Forces of the Republic of Serbia actively participate in the EUNAVFOR Operation Atalanta in the Indian Ocean, while participation in the EUNAVFOR MED Operation Sophia is also planned. The aim of Operation Sophia is to control maritime migrant routes through the Mediterranean Sea, as well as to suppress the smuggling people and help shipwreckers. Increased frequency of migrant maritime accidents limited the possibilities for exploiting search and rescue forces.

Saving life at sea is as old as sailing. From the first experiences and accidents that happened during the sailing, people have developed different rescue techniques, gained knowledge of favorable and unfavorable aspects of rescue and environmental condition, the functioning of the human organism and means of lifesaving (Radojević, 2013).

2 MARITIME TRAINING AT THE SERBIAN MILITARY ACADEMY

Serbian Military Academy has heritage and tradition of education and training personnel for maritime and inland navigation. Military Academy has adopted and developed educational and training program against piracy applying all the provisions and recommendations of the IMO conventions and IMO model courses (Šoškić, Čurčić & Radojević, 2011). A good example of this training course is the training of the Serbian Autonomous Vessel Protection Detachment that is deployed to the WFP vessels in EU Operation Atalanta (Šoškić, Radojević and Komazec, 2014).

Although we have training program which is elaborated, after every mission feedback received from participants is thoroughly analyzed, in order to further improve development. The feedback is crucial for each of the subsequent courses. Requests for new training of Serbian AVPD team were directed to enhancement number of classes for personal and collective safety and security at sea and training on ship simulator.

Our research is focused on improving the quality of the maritime training and educational process of training cadets, officers and NCO Serbian Armed

forces and River flotilla in SAR at sea. Military Academy has developed a unique maritime training for people who are engaged in SAR Operations at sea. Benefits for the Ministry of Defence would be preferable maritime training for Serbian military staff for participation in maritime operation.

3 TRAINING METHOD FOR SEARCH AND RESCUE OPERATIONS

Based on the risks related to maritime accidents, as well as the dangers that may affect shipwrecks, a systematic training method is developed for personnel who may engage in SAR operations. The training method is based on theoretical knowledge and knowledge of the human organism, experience acquired in practice, as well as the provisions of the International Convention for the Safety of Life at Sea (SOLAS), and in particular the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended 1995 - STCW 78/95 and STCW 10 of Manila (SOLAS, 2009 & STCW, 2010).

The conducted research focuses exclusively on the operational-tactical simulator based training for SAR operations at sea without going into other aspects of the migrant issue. Projecting and development of operational-tactical training method based on SAR operation at sea uses ship simulator laboratory and other facilities at the Military academy with cadets participated in the training exercises. Developed training method is based on procedures according to SOLAS and IAMSAR and execution of operational planning on ship's bridge simulator in SAR operation at sea.

In accordance with the requirements of MERSAR and IAMSAR international conventions the instructor has to create search and rescue situation at the Mediterranean Sea on ship simulator. Simulators enable the full-scope of search and rescue operations training as per the IAMSAR manual (IAMSAR Manual, 2016). Modelling of situation for rescue migrants at sea, as well as of the communications, allows training in their use and in the coordination of the search and rescue operations in the most adverse weather conditions. Training scenario cover different hazards and risks at sea. Ships or boats in disaster do not have lifesaving appliances, have inadequate or insufficient lifesaving appliances.

Rescuing represents a very delicate stage of shipwrecks and, as mentioned, at this stage a shipwreck is threatened by multiple risks. Risks that may appear during a shipwreck are widespread: injuries on board, which can be mechanical and thermal; drowning; choking in oil, grease and other dangerous liquids that come from damaged tanks; burns of inflammable liquids, spilled over the sea surface; danger of cold or heat, etc. Understanding the conditions in which the shipwreck finds itself is an important prerequisite for a successful rescue (Radojević & Milinkov, 2018). Actually, according to Guide to Recovery Techniques, all seafarers and vessels may suddenly be involved in to recover people in distress at sea (Guide to Recovery Techniques, 2014).

In accordance with above mentioned, SAR situation created by instructor was given to trainee as an exercise. The baseline of the planning of the SAR operation is SMEAC system (Situation, Mission, Execution, Administration and Logistics, Command, Control and Communication), which they use to document their orders and instructions for operation (U.S. Coast Guard Emergency Management Manual Volume I, 2019). Using SMEAC Operating procedures is crucial for search and rescue operations at sea (Maritime Search and Rescue Service Implementation Guide, 2017).

In simulated conditions, trainees are given the task of finding migrant boat in distress or migrants who have experienced shipwreck. A group of 9 trainee participate in decisions making process based on data and procedures (Figure 1). Training method includes incident data analysis about: details that lead to shipwrecks; distance of the accident site from SAR units; the number of people in distress; hydrometeorological conditions; the dangers that endanger life in the rescue phase; personal and collective lifesaving appliances; swimming in rescue conditions and in conditions of a turbulent sea, and in conditions with a fire on the sea surface; boarding the raft or boat and use of available equipment; first aid with the cardiopulmonary resuscitation at every situation: in the water, in a boat, on a raft; as well as the survival methods at sea in different conditions and different areas (Radojević & Milinkov, 2018; (Małyszko, Wielgosz, 2016).

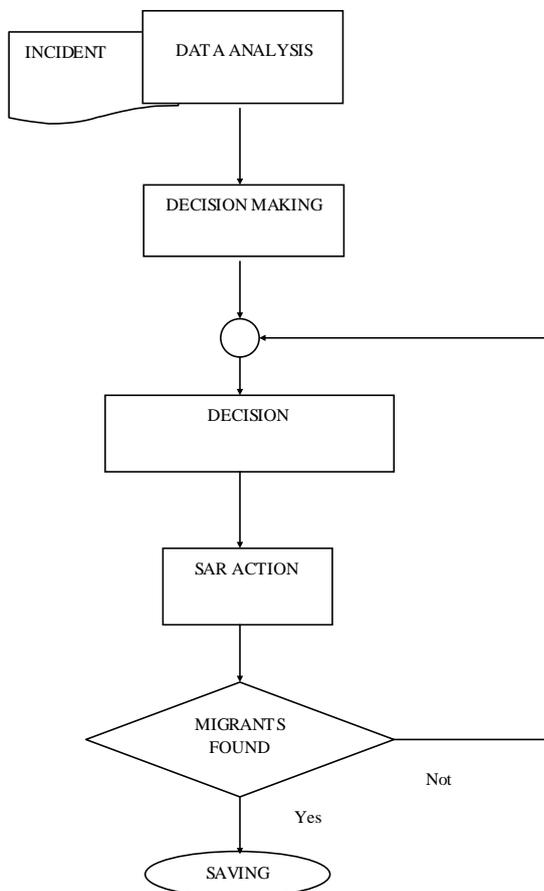


Figure 1. SAR incident – migrant saving

The most important thing in SAR operation is time from the moment of receiving the signal to the rescue of the shipwreck. For the calculation of the time, the formula (1) shown below can be used.

$$t_t + t_{dm} + t_r + \frac{D}{V} + t_s \leq t_l \quad (1)$$

t_t - time from shipwreck to signal reception (in modern age that is approximately two minutes),
 t_{dm} - time for decision making (approximately ten minutes),
 t_r - time to equip with the necessary lifesaving appliance (approximately thirty minutes),
 D/V - time it takes to get to the shipwrecks
 t_s - time needed to rescue the shipwrecked (approximately five minutes),
 t_l - time during which shipwreckers could stay alive in water (there are tables with a calculated survival time in waters of different temperatures). This is control time for the successful completion of the ship simulator task.

Trainee uses survival times presented in curves or tables as a function of water temperature, e.g. the classic Molnar survival curve (Molnar, 1946) and the water immersion survival table in the book Essentials of Sea Survival by Golden and Tipton (2002). Most important weather conditions are swell, wind strength, wind direction, waves, temperature, precipitation and visibility. In particular, water temperature and physiological status of the victims is most important due to rescue operation and surviving at sea (Xu, X., Turner, C. A., & Santee, W. R. 2011). As one can realize, it is very important that decision is made quickly, and by the control time we can evaluate success of simulation.

Also trainees analyze procedures for recovering persons from water. The importance of proper and timely preparation on board is invaluable for the successful implementation of rescue. This include a series of preparations: line for survival boats and craft; gantry crane and cargo net for recovery of survivors; pilot ladders and manropes to assist survivors boarding the vessel; vessel's lifeboats; line-throwing apparatus; floodlights if recovery at night, and preparation of stretchers and first aid boxes for survivors requiring medical assistance (IAMSAR Manual, 2016).

Decision for SAR operation which is made by trainee is checked on the Ship bridge simulator. The simulation exercise is carried out in three groups of 3 trainees each: first group (3 members of the bridge team comprising the Captain, navigator and one assistant), second group on navigation paper chart and third group on GMDSS (Global Maritime Distress and Safety System) simulator.

The exercise consists of interconnected activities that are very important for successful rescue of people at sea and emergency response. During the exercise, trainees are practicing in the procedure of shipwreckers in the fire at sea surface and when shipwreckers is in the water outside the collective lifesaving appliances. International Aeronautical and Maritime Search and Rescue Manual (IAMSAR Manual) is a prerequisite for the launch of the search

and rescue action. Considering situation assessments trainees select among the search and rescue patterns and the techniques of finding shipwrecks in the sea (IAMSAR Manual, 2016). Also, part of the training is based on the coordination of search and rescue with aircraft.

The training on the GMDSS simulator performing communication on the proper procedures for receiving calls and messages on the accident. Ships that are in a course according to the position of a ship in trouble are obliged to prepare for rescue both the ship, as well as the people on it.

Simulation brings the opportunity to rehearse complex SAR operations decisions. The trainees not only can learn SAR professional skills and procedures, but also can deeply understand SAR environment adverseness and SAR urgency (Xiuwen, Fangbing & Yicheng, 2009). Also this simulator based training reflects upon the training experience in the debriefing session that follows the simulation run (Baldauf, et al., 2015).

The synchronous recording and playback of the event, the use of equipment and exchange on the air are the most effective means for corrective training in the search for human life at sea (TRANSAS, 2014).

Certainly, we should be aware of the fact that this simulator based training method cannot replace conventional real ship practical training. As noted by Xiuwen, Fangbing & Yicheng, (2009, p. 345): “the two methods must complement each other to improve training effect”.

4 CONCLUSION

Numerous shipwrecks have marked the history of navigation, and despite substantial technological progress, unfortunately they are also common nowadays. The Mediterranean Sea is a ‘maritime cemetery’, as many ships and boats during migrants’ transportation occur shipwreck. A large number of human lives have been lost due to the lack of knowledge of medical and technical aspects of rescue. In this way, the best training is performed for future crew members and embarked crewmen for the proper procedures in the case of SAR at sea. Military Academy has developed a unique training method for people who are engaged in SAR at sea. Training method for SAR operation at sea developed by using simulator and Operational Planning. The essence of this training is technical, as well as moral education in lifesaving at sea. The research study found that the developed method improves the training and learning experience in rescue at sea. The proposed training model can be developed and applied in all schools and centers where seafarers, other nautical staff, police and custom crew, pilots, search and rescue personnel, students, and several non-governmental organisations (NGOs) are trained in SAR at sea. The Military Academy further develops a SAR model of training to provide the highest quality knowledge necessary for the successful performance of assigned duties.

The Military Academy will continue supporting the deployment of members of the armed forces in

such operations, and in cooperation with other training centers, will perform the best possible preparation of all members for future operations.

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