

Role and importance of simulator instructor

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ABSTRACT: Traditional concept of seafarers' training was based upon theoretical teaching in class room followed by the practical training onboard ship. This concept underwent profound changes in 80s due economic and practical reasons emanating from new face of the marine industry. Simulator based training had obvious advantages of being economical, safe and redundant. But it had its own implications as well. How perfect a simulator may be, it still was far away from real ship experiences. Instructor became more and more important and he is actually responsible to connect up the simulator experience with real ship experiences through his visualization and does not let the trainee get into a discourse or fall into a game mood. This study examines how the importance of simulator instructor is on the rise and present tools available for the qualification of the simulator instructors need to be augmented with new measures so as to ensure the quality of the simulator based training of the seafarers.

1 INTRODUCTION

Purpose of this research work was to evaluate and highlight the importance of simulator instructors in training of seafarers and achieving the desired results of competency based training of STCW Convention. During the course of research on the subject topic, numerous questions were raised as under and efforts were made to find out some worthwhile replies to these questions:

- How does the history of the use of marine simulators prove their effectiveness and their expanding use for the training purposes in future also?
- What are the future trends and requirements in design and manufacturing of simulators, work in progress world wide and problems being faced by the manufacturers?
- What is the role importance of instructors employed for conducting training using simulators?
- As of today, what are the tools available to ensure the quality of simulator instructors and how to improve these tools?

1.1 Training value of simulators

Like other fields of training, use of simulation in the marine industry is owing to the multiple factors covering technological, financial and training needs of the time. Training value of simulators is well accepted as simulators are coming closer to the real equipment. In fact, whole of the system fitted onboard ship can also be installed as simulator in a purpose

built scenario. Conditions and environment in a simulator can be repeated again and again to improve the learning outcome of training, unlike ships where all situations are new ones and no repetition is available. Simulation gives chance to apply the theoretical concepts to demonstrate their practicality. For example, operations in shallow water effect area or modification of the entering/leaving harbor route plan can be tested on simulators. Multiple types of ships are available on simulators for boarding and operation by the trainees. They can actually feel the difference between behavior of a medium size general cargo ships and a Very Large Crude Carrier (VLCC).

Much work has already been done on the advantages and disadvantages on simulator based training and its comparative value vis a vis real time experiences. Now, the only discussion is when to have and how to have the Simulator Based Training (SBT) for the ship's crew for better, efficient and speedy ship's operations.

1.2 Definitions

There is a need to refresh some the definitions associated with Simulator Based Training (SBT). Uniformity of the simulator based training means that when same simulator exercise is run for multiple trainees at different times, it has same training value with respect to basic learning outcomes. Reliability is the consistency of the measurement procedure. Reliable assessment has well defined conditions, administrative procedures, performance measures, standards and scoring

scheme. Validity of the assessment method is the characteristic of the measurement, specifically the extent to which a measure represents what was intended to be measured. Finally, fidelity is the measure of the accuracy and precision of the simulator equipment to faithfully reproduce the ship's behavior.

1.3 Relationships

Reliability of simulator based training means that instructor was able to impart all the performance standards to the trainees as he planned in the exercise or were part of the training objectives. Uniformity of the simulator based training means that when same simulator exercise is run for multiple trainees at different times, it has same training value with respect to basic learning out comes. An exercise on simulator can be very good, effective and reliable but then the problem of uniformity is required to be addressed. Best exercise is the one which has both, reliability and uniformity in parallel.

Fidelity and validity are the two features which depend on each other in simulation. There is a direct relationship between fidelity and validity. Fidelity, the inclusion of the real world elements, contributes to validity. The omission of real world elements may make the valid system performance on the simulator impossible. It is not appropriate to consider the provision of high fidelity a substitute for validation of the system. However, there is generally more confidence in a high-fidelity system than a low-fidelity one. Fidelity adds to the validity of simulation. In the past it may have added to the cost considerably. This relationship has changed due to recent micro-processor developments.

1.4 Simulator Based Training (SBT)

Simulator based training is steadily replacing the in-service training of seafarers. STCW Convention also gives weightage to the training conducted at a simulator with experience of in-service training. Over the time, simulator based training has started having more face value and weightage. Training needs to have validity and reliability both in parallel. Now simulators can simulate a diverse range of ship's types, scenarios and situations which in actual life may be rare to occur. This increases the validity of the simulator training vis a vis in-service experiences. Also with regards to reliability, simulation can be very effective due positive control and training environment in Maritime Education and Training Institutes and Centers (METICs); whereas in-service experience may have difficulty in controlling training conditions and administrative procedures.

It is well recognized fact now that simulator based training has the potential of providing knowledge which other wise could only be gained through years of real world experiences. Realization of this potential, however, depends upon the ability of simulator training program to take into account the special cognitive needs of the trainees and ability of the instructor to properly provide the feedback to the trainees.

2 SURVEYS ON SIMULATORS AND INSTRUCTORS

Two surveys were conducted to find out some of the facts and problems being faced by the instructors and the trainees in the simulator based training.

2.1 Survey Report One – Simulators

Survey was designed to find out the training experiences of the seafarers on simulators as trainees and its relevance with subsequent job description. World Maritime University (WMU) students of varying background and sea service were used as population for this survey. Some of the areas highlighted in the responses are increasing complexity of simulators, availability of all types of simulators for training purposes, and ease of having real time experiences on simulators.

2.2 Survey Report Two – Instructors

Survey was designed with the aim to get feedback from METICs regarding the qualification and experience of simulator instructors and associated problems being faced. International Association of Maritime Universities (IAMU) member institutes and other METICs were surveyed. Some of the areas highlighted in the responses are increased demands on instructors capabilities, complexities of exercises, and need of having qualified instructors for simulator based training.

These remarks made by seafarers of diverse background and METICs of varying nationalities are indicative of universal importance of simulators and instructors in conducting any training activity on a simulator.

2.3 Relationship between Instructor and Trainee

There is always a particular relationship between an instructor and his trainee. Traditionally, a teacher has an overwhelming influence and effect on how the training is conducted. Also, any weakness on part of the instructor with respect to knowledge, confidence and commitment will be noted by the trainees and will adversely affect the learning

outcome. Development of attitudes and shaping the behavior is one of the important elements of any education and training activity and largely depends upon the quality and characteristics of the instructor.

2.4 *Training on Simulators*

Training process on simulators has its own dynamics and requirements. There are various stages and elements of simulator training and an instructor needs to be well conversant with these stages and elements to be effective in training process. When we see how the training exercise is actually run on simulator, whole process of exercise can be divided into briefing, simulator familiarization, conducting & monitoring and debriefing. Professor Muirhead (2003) has discussed these stages in his writings in details and are widely accepted by the marine professionals.

3 EFFORTS TO IMPROVE THE SIMULATOR INSTRUCTOR

Taking into account the importance of the simulator instructor in conducting the quality training on simulators and achieving the desired results of competency based training required by the STCW Convention, there have been multiple efforts in the industry for improving the qualification of the simulator instructors.

3.1 *World Maritime University*

World Maritime University designed a Professional Development Course (PDC) in 2004 with the aim to impart instructional skills to maritime simulator operators. This one week course was meant to assist both experienced and new simulator instructors as well as maritime lecturers to better understand the application of the STCW95 convention in relation to the training and assessment of seafarers on marine simulators. The program was supported by the simulation facilities and instructor staff of the Maritime Institute William Barentz (MIWB), Terschelling. A certificate of attendance was issued by the university to the participants.

3.2 *Train the Trainer Course*

With the active involvement of the International Maritime Organization (IMO) and regional industry players, 'Train the Trainer' Course has been conducted at the Integrated Simulation Centre (ISC). This course was meant for improving the expertise of the simulator instructors in conducting the simulator based training. Participants were

Nautical and Engineering officers both from the administration and METICs from South Asia, South East Asia and Far East. Such a 'Train the Trainer' course was also conducted at Regional Maritime Academy, Ghana with the assistance of the IMO. Participants were from the African continent and aim was to promote the simulator based training in the less developed countries and improve the quality of the simulator instructors.

3.3 *IMO Model Course 6.09*

Realizing the importance of instructors in achieving the aim of quality training of the seafarers, IMO Model Course 6.09 Training Course for Instructors was developed to provide a framework for any training imparted to an instructor of METICs. This course is the first step for having quality simulator instructors. By having a detailed analysis of this model course, it can easily be realized through its contents that its basic aim is to provide fundamental instructional techniques to a maritime instructor and no strong emphasis has been laid for use of simulators and its associated problems.

4 CONCLUSIONS AND RECOMMENDATIONS

Based upon the discussions on the role and importance of the simulator instructor in the dissertation, multiple conclusions and recommendations were made by the researcher.

4.1 *Conclusions*

Some of the conclusions drawn by the researcher are as under:

1. Training value of the simulators has widely been proven and accepted by the marine industry. Simulator based training is cost-effective, convenient and diverse in scenarios. Simulator exercises can be designed, conducted and controlled as per user requirements; these exercises can be repeated with quality control and ships' operational limits can be touched upon in risk free environment. Simulators have made available the multiple operating conditions anywhere, anytime without time and space barriers as applicable to onboard training process.
2. IMO Model Course 6.09 is meant for training of the marine instructors. Its main emphasis is on how to conduct the theoretical and class room instruction. While giving details on how to use boards, displays, training aids and handouts / notes, this model course lays very less emphasis on how to use simulators for effective training of the seafarers.

3. Simulator instructor is much more than an instructor. He is involved in skill based training of adult learners and is responsible for Psychomotor and perceptual skills while controlling the practical thinking in parallel. He is fighting a war on much more larger scale than any other instructor.
4. Recognizing the importance of the simulator instructor, STCW Convention desires him to be 'appropriately' qualified and experienced on the simulator training; but no specific requirement has been made to give some meaning to this appropriately qualified term.
5. Some individual efforts were made to design a suitable course for the simulator instructors. World Maritime University (WMU) designed and developed a Professional Development Course (PDC) in 2004 with the aim to impart instructional skills required for maritime simulator operators. Also 'Train the Trainers' courses were conducted at Integrated Simulation Centre (ISC), Singapore and Regional Maritime Academy (RMA), Ghana to train the simulator instructors of these regions.

4.2 Recommendations

Based upon the conclusions drawn during the research work, it was recommended that:

1. Simulator based training should be made mandatory at various levels of seafarers to achieve the competency based training objective of the STCW Convention. A 'successive approach' can be adopted whereby simulators are made mandatory one by one in stages but there is strong need to move from position of 1995 when only the Radar/ARPA simulator training was made mandatory in the Convention.
2. There is a need for IMO Model Course for Simulator Instructors. This course can act as bench mark for the qualification of the simulator instructors to appropriately qualify them as per requirements of the Convention. Professional Development Course (PDC) on the subject designed by WMU can be taken as basic reference and modified/added to suit the world wide requirements of the simulator instructors.
3. Simulator Instructors employed in the METICs for training of the seafarers should undergo some formal training on use of simulation for competency based training. This training package for simulator instructors will better serve the purpose if it is designed and promulgated through IMO / STCW Convention. Only a qualified simulator instructor can ensure quality training as per the standards laid down in the Convention.

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These are the extracts of a dissertation submitted to the World Maritime University (WMU), Malmo, Sweden in partial fulfillment of the requirements for the award of the degree of Master of Science in Maritime Affairs specializing in Education and Training in year 2006.