



## **SIGNIFICANCE OF SIMULATOR TRAINING IN MARITIME EDUCATION**

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### **ABSTRACT**

*Over the last few decades there has been a drastic change in marine industry owing to the development of technology. The duties of seafarers have also experienced a dramatic transfiguration, responsive to these changes in the industry. Some of the recognizable changes can be the extensive containerization and also transportation under flags of convenience. The heavy competition between the associated companies has altered the way in which seafarers perform and rest. Performance has been restricted to fewer personnel (of Multinational origin), and port stay has been drastically reduced.*

*This growth in the shipping industry requires seafarers to be trained to take up different, challenging jobs on-board different types of ships. Specific types of ships require specific skills for the seafarers to work there and hence specific training required. Training is an integral part of the process to prepare the seafarers for the job on-board. The training imparted to the seafarers could thereby divided into two segments, pre-sea and post sea. The post-sea training requires the much needed simulators to train the seafarers once they have gained an experience on-board.*

**KEYWORDS:** Human Miscalculation, Simulator Training, Uses of training, Marine simulator, stress and fatigue, Inadequate communication.

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## **Introduction**

### **Maritime Training- General**

International Maritime Organization (IMO) being the overall authority for the globalized maritime workforce has brought out under the Convention on Standards of Training, Certification and Watch keeping for Seafarers (STCW) certain regulations which highlight the need of training.

Training can be imparted in many different ways, but it is essential to match the training methods to the situation. It is imperative that each of the training method used is assessed by engaging the course participants in a feedback process. This aims to ensure that the training is effective and that trainees get the required knowledge, skills as planned. Then the results from the most sought after take the results from the most popular and most effective methods to design a specific training program.

To evaluate training a basic four level approach is taken. This method comes in handy not only in evaluating the existing programs, but also for designing new programs. . This process focuses on four levels of training outcomes which are as below:

Reaction

Learning

Behavior

Result

The importance of training can be adequately understood by the following quotes:

What I hear, I forget. What I see, I remember. What I do, I understand.

(Confucius, 451 B. C.)

Tell me and I forget. Teach me and I remember. Involve me and I learn.

(Benjamin Franklin)

What we have to learn to do, we learn by doing.

(Aristotle)

### **Brief Description of a Simulator**

A simulator may be defined as a machine with a similar set of controls designed to provide a realistic imitation of the operation of a ships or other offshore equipment. Simulation is essentially a virtual replication of the operation of a system over time. A model imitating the key

characteristics or behaviors of the selected physical or abstract system or process developed to achieve the act of simulation. The model is a representation of the system itself, whereas the simulation is a replica of operation of the system over time.

There are three basic attributes that every simulation should have. If all three attributes exist, then you can easily call something a simulation. However, if even one attribute is missing, then it's not considered as a simulation. These three attributes as mentioned below:

- a) Imitates something real, but
- b) It is not real, and
- c) It may be altered by its users (hence instructor plays an important role).

Simulators offer a superb platform for learners to perform something in virtual world. In the marine & offshore industry there are several good examples of simulators such as engine-room simulators, specific cargo handling simulators and bridge/navigation/communication simulators. These simulators provide the fresher's an opportunity to perform tasks virtually, which otherwise would have been expensive, time-consuming and risky, had they been done in real time. Repetition of wrongly carried procedures corrects errors which would have cost a ton should they have been carried out in real-life situations.

According to Cieutat, Gonzato and Guitton (2001) numerous training simulators are available in maritime industry, globally. This training/learning initially was restricted to the use of simulators for Radar training for quite a while, before the other simulators were accepted. Nowadays designing a simulator for ships is becoming formidable venture, as would have been designing a flight simulator in the past. A trainee needs to have the complete feeling of being onboard a real vessel with the use of all instruments and systems required for its navigation and operation of a ship; like meteorological environment, a console of controls, a steering system, a sonar and radar and in addition marine chart visualization software Procedures have also to be practiced in monitoring, operating and maintaining the systems onboard.

### **Simulation in Marine Industry**

Simulation in Marine/Offshore Industry in India and Globally Like other fields of training, use of simulation in the marine industry is influenced by multiple factors which obviously include technological, financial, suitability and training needs of the time. Some of these factors are:

- Due to technological advancements different types of ships may be simulated together in one simulator, hence simulation technology is available for multiple ships operations at a reasonable cost.
- Familiarization of the inexperienced/ less experienced trainees with modern equipment used on-board ships is possible by using simulator.
- In purpose built simulators, a trainee can feel and learn ashore the activities he is expected to undertake on-board the ship, before joining a ship.
- In a simulation, complete range of the system fitted on-board ship can be simulated with purpose built equipment and scenarios.
- Training sessions may be planned depending upon the availability of the simulators, consideration to factors such as time and space can also be given.
- The vessel on simulator can be run and speeded up as per training requirements without worrying about fuel cost or time constraints (Thereby learning a lesson to save fuel when needed in real voyages).
- Training scenarios including and beyond ship's safety are possible, like close quarter situation, excessive turns and high speed maneuvering.
- Environment conditions in a simulator can be repeated over and over to condition the trainees, thereby improving the learning outcome of training, unlike ships where all situations are new and hardly any repetition is available.
- Simulation gives chance to apply the theoretical concepts to demonstrate their practicality, for example, operation in shallow water effect area or modification of the entering / leaving harbor route plan can be tested on simulators.
- One can choose his area of operation for maximum training value and increasing confidence and morale of the trainees. For example, trainees can learn and practice two different areas/channels/related operations in same day training schedule, which is not possible in real life.
- Different types of ships are available on simulators for practicing and operation by the trainees. They can actually feel the difference between behavior of different size general cargo ships and crude carriers i.e. VLCCs.
- The exercises, learning and performance on simulators can be recorded and played back to the trainees for carrying out analysis, providing feedback and pointing out mistakes done during the exercise, thus making this a unique learning opportunity.

- A trainee can change over the exercise or run the exercise at a pace suitable and demanded by training requirements and time constraints.
- The set environmental conditions in simulators are known and repeatable. This makes it possible that performance in these conditions can be graded and assessed with uniformity.
- The instructor/student has a facility so that exercises can be stopped and delayed so that particular learning points may be emphasized by the instructors.
- For propulsion and auxiliary machinery, where UMS operations are almost a requirement, it is frequently difficult for the staff to achieve sufficient familiarity with even routine operations. Many voyages may bring out some of the peculiar fault conditions one has not experienced before. By using simulators one can train the ship's staff to go through these experiences.
- By using a simulator, for training OOW and bridge team, one can manipulate weather conditions and visibility with day / night operations for real time experiences and training.
- It is possible to develop situations using simulators which are much more complex and grave when compared with real ship operations. Such situations are difficult to create on-board ships and when they occur, it's difficult to handle the same.
- With the simulators, it is possible to design tailor made courses, e.g. introduction of ships operation to new comers or specialized course for Pilot operations.

Muirhead (2003) has mentioned that “inexperienced marine professions are likely to make judgment mistakes early in maritime training. The effects of such mistakes could be expensive and at times catastrophic. In such situations the maritime simulator is considered a very helpful and beneficial tool. Learning using simulators could be an experience wherein the trainee could make mistakes and learn without having to worry about the consequences. The idea while running the exercises is mainly to learn so that under similar situations onboard, the mariner is now prepared in advance to initiate an action which he/she has practiced in a not so demanding environment.”

### **Summary**

From the above stated points it is quite evident that the importance of simulator training in marine life is immense. Besides being coast efficient this training also prepares trainees for event which they may not face regularly in their time onboard but may come across in near future. Simulator training conditions their responses to particular situations there by reducing the

damage caused to vessel due to human error (which is the biggest cause of accidents on board). We can also see how development in technology is bringing about changes in the ways of marine life, from vessel handling to training. In future also as the technology advances, it will get adapted into our industry, as marine industry is one of the very few which readily accepts any new advancements. Hence the need for simulator training will increase over time.

## **References**

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