Based on the Simulation of Engine Room Resource Management Course Teaching and Research

Xi-Kun Li¹,a and Zhi-Min YU¹,b,*
¹Tianjin Maritime College Tianjin, 300350, China
*a1762758500@qq.com, bssmhosco@126.com
*Corresponding author

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Abstract. This paper in view of the students the characteristics of the engine room resources management this course, the author puts forward the method of how to improve the teaching effect of eight: reasonable grouping, looking for a good organizer, according to the rules of plane position for drill, make full use of drilling simulation engine room, pay attention to the review of relevant knowledge, pay attention to the design of simulation scenario, pay attention to the training of situational awareness, pay attention to and project development, and constantly improve the level of teacher's professional knowledge.

Introduction

Engine room resource management is senior engineer of big certificate required by one of the content of the exam, was listed in part A of the STCW Manila amendments to enforce training, purpose is to reduce the ship engine room effect of artificial factor in the accident. By evaluating training students are required to have good communication ability, organization and coordination ability, good situational awareness and team cooperation spirit, has the capability of skilled use of communication tools. Among them the main propulsion power plant", "Marine auxiliaries", "ship management", journal of Marine electrical, power plant operation and other course is the course of professional course. Based on the reality of students lack of practical experience on board, combined with the requirements of this course, design some methods to improve the teaching effect.

Second, the engine room resource management course teaching content, teaching means Our maritime safety administration teaching outline in strict accordance with the requirements of designed five specific field project host for the car, "the voyage succession", "gas", "the voyage the ship lost electricity", "the host after the car," are the main content of the engineering department daily work, typical. Highlights practical teaching material contents, easy to understand students, stick to the professional basic course knowledge, teaching methods using multimedia teaching and scene simulation to guide and evaluate the way and by group.

Third, enhance the teaching effect in the engine room resource management advice at 8 o’clock

Reasonable Grouping, Looking for a Good Organizer

The engine room resource management examination generally in groups of four to five, five projects for drilling of achieve good teaching effect, each group member should reasonable collocation, the collocation of the business good and bad, with strong with the weak, and cannot be grouped by student number. When another group must find each group leader, the student requires not only professional knowledge, but also have good communication skills, and ability of organization, or training, evaluation of the effect will sell at a discount greatly, because the class time is shorter, the teacher must under the condition of each class on the first day of teaching to do group work, it is very important, once the improper grouping, the teaching effect is difficult to guarantee.
Drilling According to the Rule of the Engine Room Staff

Organizers should press engine room position rules to instructions of exercises, refueling, for example: the second engineer will be responsible for the amount of oil, switch valves correctly, write refueling planning; Second engineer to prepare oil spill equipment such as suction linoleum, sawdust, oil spill dispersants, etc, responsible for hanging "no fireworks" sign; Chief officer should pay attention to trim, master of the ship balance, is responsible for the preparation of fire equipment, make two B flags flying, good carpenter plugging deck drain, etc[1]. So the whole exercise is under the chief engineer command post in accordance with the rules and orderly organization. In the teaching process, some students don't know who spilled oil equipment to pipe, is to go in the position of chief officer and second engineer rules are not familiar with, advises students training before the early course of "ship management" come on take a look at the knowledge points, so it can prevent the error occurred during the exercise. see figure1. The simulation engine room.

![Figure 1. The Simulation Engine Room.](image)

Make Full Use of Drilling Simulation Engine Room

Automation simulation engine room with testing result for reference, set up the ecr [2] and the engine room. Make the fullest use of these resources in the practice teaching is a forceful guarantee to obtain better training effect. In the voyage ship lost electricity, for example, when a ship on the voyage, after losing electricity on duty personnel should use ecr telephone inform the bridge and the chief engineer, and stop the host. When the emergency generator has been started automatically, for navigation equipment and steering gear power supply, the chief engineer to send immediately start backup generators switching power supply is resumed as soon as possible. Teaching, found that students who don't know where generator closing switch, and car where synchronization table, so to make full use of the plant resources of ecr and explain, to let the students do the simulation exercise. Don’t just won't do. In addition[3], teachers in guiding students to practice to simulate the maritime safety administration assessment personnel problems arising in the course of exercises for students to record and timely correcting students' errors, and proper questions, in order to make students adapt to the maritime safety administration while they are in training evaluation.

Pay Attention to the Review of Relevant Knowledge

To obtain good teaching effect, we must to make the students into the situations of the project. And the establishment of the situational awareness must be turbine knowledge for support. During the exercise, students must grasp the relevant knowledge, can not appear any mistakes. Drill in the host for the car project, for example, students because not familiar with process for car, did not take
off the turning machine for blunt car operation, obviously a serious procedural error has taken place. For example students don't know how blunt car, some gave on the accelerator, a hedge is this knowledge is not clear. So the related knowledge in advance review is very necessary.

**Serious Design Simulation Scenario**

If a project on the design only the organizers of the command, others say: "good", the whole exercise is too smooth. In the teaching process should design some simple small fault, in training the succession on the voyage, for example, can design in mechanic succession, succession mechanic find fuel oil service tank water more small fault, then hands the mechanic think this situation is not normal, to the engineer on duty immediately report, after analysis the likelihood is heating steam pipe leakage, or oil purifier causes such as poor separation effect, in order to solve this situation, succession personnel undergo screening together, this design can reflect the content of the mechanic succession, and conform to the mechanic found that the problem must report to the engineer on duty, the contents of the handover process meticulous, rigorous and comprehensive.[4]

**Pay Attention to the Training of Situational Awareness**

Still in the ship lost on the voyage electricity project as an example, as exercise all staff especially the organizers must grasp three aspects: first, to restore power as quickly as possible. Second, Ship's power supplied as quickly as possible. Third, investigate the cause of losing electricity. Rapid and accurate according to the chief engineer of turbine personnel responsibilities command, and first order second engineer start the standby generator to restore power, command first engineer check steering gear case, once the restored immediately start for hosting various kinds of pumps, ordered the third engineer check the emergency generator, restore power after some auxiliary boiler, to ensure that the fuel oil heating. Engine room all personnel should be in the drill into the stress state of emergency, to run when you execute the command. This makes the drill into the emergency treatment after losing electricity situation. In order to achieve good teaching effect, also can leave the last student good training video to students on the phone, let the students watch repeatedly, can help students learn how to enter the role of, here again, solid turbine knowledge is the foundation of good situational awareness to build.

**Pay Attention to and Project Related Knowledge**

This is mainly designed to cope with the assessor's question. To the "gas" project as an example, in addition to refuel program requires students to exercise, but also pay attention to some details, such as heavy oil measurement method, gas quantity how to fix, how to consider the influence of the trim, oil sample of the specific methods and so on. It can introduce some refueling matters needing attention in practical case to deepen students to come on memory and understanding. [5] If there is a lack of oil, for example, when oil tanker vessel fill must to sample production, so as not to fill oil has caused by different fault of navigation. see figure2. The ship bunker station.
Improve Teacher's Professional Skill

Due to the engine room resources management this course practicality is very strong, suggested teaching the course of the teacher must be a "double type" teachers, and to master the characteristics of Marine equipment and management, the theoretical level also requires very high. This is mainly because this course has a very rigorous teaching requirements.[6] For example, in the host for car training, and found to be the no. 2 generator tachometer unstable and stable voltage and frequency table, based on experience judgment may be tachometer is broken, then we can't tell the student can and cars, and restart the no. 3 generator and electricity, because must ensure that reliable and cars, we can't bring the ship's mistake to teaching, it is very loosely, does not conform to the engine room resources management to the teaching requirements of the course. Suggestions related teachers aboard practice regularly, constantly sum up experience, efforts to achieve a good combination of theory and practice.

Conclusion

More than eight aspects how to improve the engine room resource management are summarized the teaching effect of this course. Every professor the class the teacher should try to improve the teaching method, raise the teaching level unceasingly, can achieve the requirements of STCW convention, causes the student to become a maritime career qualified personnel in China. The other stuff lesson and the teacher should actively research and communication, make long teaching complement each other, so suggest at least runs in teaching by two teachers.

Attention to the training of situational awareness, pay attention to and project development, and constantly improve the level of teacher's professional knowledge.

References
