The Implementation of the Safety and Security Courses into the MET System of Odessa National Maritime Academy

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Abstract Shipping has always been a risky industry. The safety of navigation is one of the key issues of modern shipping. The detailed analysis of ship accidents has shown that the majority of accidents with far-reaching consequences can be traced to human (or organizational) errors. Only about 20% of catastrophic accidents are caused by structural or mechanical failure of the vessel under extreme environmental conditions.

Accidents resulting from operations have several origins. Various factors may influence the occurrence of human errors. Economical difficulties of the ship owner may lead to dangerous compromises and reduced safety standards, errors in management decisions i.e. organizational errors may also be closely associated with the reliability of ship operations. The designing engineer as well as the ergonomist may also be addressed in this respect as they influence the human behavior and may cause an individual error and human errors can be minimised by creating the right working environment. To cope with the intolerable degree of maritime casualties IMO issued some documents, the most important of which are STCW 1978 Convention as amended in 1995, STCW Code and ISM Code.

Another problem the world shipping is nowadays facing is security. In general security is not a new issue. The vulnerability of ships on the open ocean, without any protection has long been recognized. Piracy and terrorist attacks are common threats in this respect.

Formal security measures have been introduced only very recently, being formulated in the International Ship and Port Facility Security Code (ISPS), agreed by 108

nations at the December 2002 IMO Diplomatic Conference on Maritime Security which took full effect on 1 July 2004.

Safety and Security have the same aim, namely the protection of people, property and the environment. Both are connected with risks and in both the so-called “Human factor” is a central element.

Although security concerns the risks connected with protection against willful i.e. intentional acts of disturbance, damage or destruction while the safety on the other hand concerns the minimization of the risk of something accidentally going wrong, safety and security go hand in hand.

There is no better example to prove it than the close relationship that exists in both cases with the human factor. Security threats, latent or acute, will influence the behavior of the crew on board and thus have an impact also on safety.

Taking into consideration the importance of the “Human factor” IMO has put forward the objective today to provide the assurance that the people manning the ships of the world today are motivated, educated, qualified in accordance with adequate standards and practically have all the necessary skills for proper fulfilling their duties under any circumstances.

This preconditions a high level of safety and security culture, the development of these qualities being the task of the educational institutions. Odessa National Maritime Academy is implementing the development of the above culture as a mandatory part of the modern MET model.

0 Introduction

High consequence accidents resulting from human error can be caused by drawbacks in design and construction or by mistakes in the operation of a vessel.

Accidents resulting from operations have several origins. Traditional values may influence the occurrence of human or organizational errors. Errors of individuals finally are also responsible for some of the accidents.

The human factor in the maritime industry is a complex diverse problem. We are going to discuss here only those aspects which affect safety and security.

Ship-builders usually concentrate their attention on the structural design of the ship, the machinery and the equipment. Only recently it has become evident that for a significant improvement in the safety operations is also a human element, the organization and the total system has to be regarded.

1 Terms & definitions

Let us give definitions to “HAZARD” and “RISK”, both terms are widely used in discussing issues of safety and security. HAZARD is a “potential, undesirable outcome in the process of

achieving a certain purpose, solving a problem or performing some actions" or "a physical state which can be harmful under certain circumstances"[7].

There are many definitions of the term "RISK". Ch. Kuo gives the following definition: "Risk is a measure of danger including its consequences and probability of its occurrence. The simplest mathematical expression of risk is the equation: $R=PC$, where R- Risk, P- probability and C- consequence"[6].

Steven Jones, the author of "Maritime Security. A Practical Guide."[1] gives the following definition: "Risk is the likelihood a specific threat or hazard will exploit a certain vulnerability, and the resulting impact of that event: Likelihood x Impact = Risk or Vulnerability x Hazard = Risk.

Risk analysis is the starting point in an overall risk management process; it is a systematic approach that identifies and assesses risks and provides recommendations to reduce risk to a reasonable and appropriate level. Risk can be categorized, say, very low, low, medium or high and an appropriate and proper response than put in place. If only a low risk is posed by certain threats it may be simply accepted"[6].

The experts in maritime safety are also trying to categorize risks. Existing risks are divided into static and dynamic… Shipping companies are mostly interested in static risks, as they are deeply concerned in preventing or limiting losses. "Management of risks" is defined as an instrument of protection company's resources and incomes from losses[6]. That is we can conclude that both ISM and ISPS Codes impose a risk management approach.

2 Human-related hazards to safety

Human error occurs on board ship when a crewmember's ability falls below what is needed to successfully complete the task. Whilst this may be due to a lack of ability, more commonly it is because the existing ability is hampered by adverse conditions. Below are some examples (not complete) of personal factors and unfavorable conditions which constitute hazards to optimum performance. A comprehensive examination of all human-related hazards should be performed. During "the design stage" it is typical to focus mainly on task features and on board working conditions as potential human-related hazards.

- Personal factors;
- Reduced ability, e.g. reduced vision or hearing;
- Lack of motivation, e.g. because of a lack of insensitives to perform well;
- Lack of ability, e.g. lack of seamanship, unfamiliarity with vessel, lack of fluency of the language used on board;
- Fatigue, e.g. because of lack of sleep or rest, irregular meals;
- Stress;
- Organizational and leadership factors;

- Inadequate vessel management, e.g. inadequate supervision of work, lack of coordination of work, lack of leadership;
- Inadequate ship owner management by, e.g. inadequate routines and procedures, lack of resources for maintenance, lack of resources for safe operation, inadequate follow-up of vessel organization;
- Inadequate manning, e.g. too few crew, untrained crew.

Inadequate routines, e.g. for navigation, engine room operations, cargo handling, maintenance, emergency preparedness[3].

3 Human-related hazards to security

Steven Jones in the following way identifies the "**HAZARDS"** to security of the ship in the form barriers to vigilance:

Fatigue. Tiredness, overwork and fatigue are all major barriers to vigilance while all onboard work is under the auspices of the STCW Convention, Hours of Rest Rules, there are many who believe that the minimum manning standards applicable on vessels do not take into account the extra work generated by the requirement of ISPS Code.

Lack of time. As with the concerns over fatigue it is recognized that ships are busy and that personal may not feel they have time to apply security or to remain vigilant.

Familiarity. Security is still not a natural function of many seafarers' day-to-day operations and many lack the confidence and experience that they constantly apply to safety. It is this lack of knowledge that can lead to wrong responses or even no responses. Until all crew and officers are fully conversant with all provisions within the SSP there can be no true security culture in evidence.

Lack of training. It is clear that unless personnel fully appreciate the threat facing them there is little chance of their willing or able to adopt security as an important part of shipboard life and operations. A lack of training, knowledge and skills is a serious barrier to progress and it is the job of master, CSO and SSO to identify those who lack them. It will be then necessary that the crew understand what is expected of them and also the reasons for this[1].

All the sources claim that the level of safety culture and training of seafarers are not adequate. As to the security culture it hardly exists:

- "lack of seamanship…", "unfamiliarity with vessel"[3];
- "a vessel may have the best equipment, and work under the most effective security management systems, but all this counts for nothing without the involvement of adequately trained and motivated"[2];
- Security of maritime transport can only be as good as the people working within the industry;
- "The awareness necessary to maintain a secure and vigilant vessel takes a number of different forms but at all levels it requires the master, SSO, officers and crew to have certain levels of

knowledge and training…"[2].

4 Safety & security courses at ONMA

Odessa National Maritime Academy maintains constant contacts with the different organizations responsible for shipping safety in Ukraine:

- Ministry of Transport of Ukraine;
- State Department of Sea and River Transport of Ukraine;
- State Inspectorate for Training and Certification of Seafarers;
- State Inspection for Safety of Shipping of Ukraine;
- State Maritime Inspection of Ukraine;
- Russian Maritime Register of Shipping;
- Ukrainian Maritime Register of Shipping.

For further development of safety culture required by ISM Code and in connection with the coming into force in 2004 ISPS Code it was decided to establish the Department of Safety and Security at Sea in Odessa National Maritime Academy which was effected in 2003.

The department started the new disciplines:

- Ship Safety Management;
- Organization and Standards of Ship Security Provision;
- A new optional special course "Administration of Safety at Sea" was opened at the department in 2005;

The following disciplines are covered at the course:

- Responsibilities and functions of Flag State;
- Responsibilities and functions of Port State;
- Coastal State and its function;
- System of training and employment of seafarers;
- Methodology of marine accident incident investigation;
- Instruction of Shipboard and shore personnel in emergency situation.

A special certificate of the approved form is issued to every graduate of the course[7].

5 Conclusion

So we can conclude that the implementation of the safety and security courses in the MET system of maritime higher educational establishments is an urgent problem.

Safety and security go hand in hand. There are examples where the new security efforts will possibly enhance safety.

When speaking about the aspects of education and training process we may easily come to conclusion that the investigation in these two spheres and consequently the educational disciplines have so much in common that it is desirable to unite them into one educational and research complex.

Although we are learning a lot from safety as we start to be involved with security, there are many examples where safety requirements may actually be damaging in respect to security. Many of the safety requirements as well as operational procedures prescribed for instance for equipment may actually clash with security.

But it still more proves that these disciplines should be investigated and trained by one maritime educational and research centre. Especially if formalization is sought to be undertaken the theoretical process is to be very similar if not the same.

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