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Impact of Ship Technology and Environmental Legislation on ISM Code

Xiaopeng Sun[1], Liang He[2]*

[1]World Maritime University, Fiskehamnsgatan 121118, Malmö, Sweden

[2]Shanghai Maritime University, 1550 Haigang Avenue, Shanghai Pudong New Area 200120, China

***Corresponding author:** Liang He, heliang0002@stu.shmtu.edu.cn

Abstract: This paper contains a detailed analysis of the International Safety Management Code (ISMC), a fundamental sea-based standard whose priority is safety through incorporating safety management systems (SMSs) that meet the requirements of shipping companies. Established by the International Maritime Organization (IMO) in 1993, the ISM Code's primary goal is to reduce maritime accidents by enforcing safety on board. This study includes the historical part of the ISM Code, the evaluation of its efficiency as well as the identification of the obstacles that stand in the way of its actual implementation. In addition to providing this information, this section also explains the rise of the ISM Code through considerations such as the effects of technology and the implementation of strict environmental legislation.

Keywords: ISM code; Ship technology; Environmental legislation

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1. Introduction

The International Safety Management (ISM) Code was originally developed by the International Maritime Organization (IMO) in 1993 as the very first big step forward in the cause of maritime safety and environmental protection. The ISM Code is a designed method of ensuring that shipping operators can come up with safety management systems that bring vessel operations to safety, lower the number of incidents, and minimize environmental risks. Because maritime safety is a very important part of world trade, the ISM Code is the concept of operational security; doing away with the situation of risk; and, in fact, the safe operation of ships and shipping companies is the content of the ISM Code. The study will be confined to the ISM Code from the time it was launched to the present, will deal with the question of whether it has been effective or not, and in the end, will suggest some tactics to make it sustainable in the future.

2. Background of the ISM code

The International Safety Management Code (ISM Code) was the result of several shipping accidents, e.g., the capsizing of the Herald of Free Enterprise in 1987, which resulted in the need for standardized safety management systems in the maritime sector [1]. Before the introduction of the ISM code, there was no international standard that actually focused on the safety management of ships and shipping companies. The lack of formalized regulations caused differences among these safety practices, consequently leading to incidents that could have been avoided.

During the IMO Assembly in 1993, Resolution A.741 (18) was adopted, thereby the ISM code was made a requirement for ships that have passenger and cargo respectively over 500 gross tons. As time passed, the code was regularly edited and amended. the code was insisted for all ships including oil tankers and chemical carriers through the SOLAS (Safety of Life at Sea) amendment in 1998, and the coverage was improved to implement other safety aspects such as the environment and human factor.

3. To discuss the required policies/laws in the ISM code

The ISM Code has two main parts: Part A and Part B. Part A contains the obligatory requirements, while Part B gives instructions for compliance. The core of the code is present in the following areas:

Safety Management System (SMS): Maritime transporters need to have a safety management system including plans that guarantee the proper utilization of vessels and avoidance of accidents.

Responsibilities and Authority: The firm should articulate the roles and responsibilities of critical personnel such as senior management, and ensure that the command structure for the safety and operation is crystal clear.

Risk Management: The ISM code underscores the significance of identifying hazards and adopting control strategies to keep maritime operations safe from accidents. This should be the operational hazards, namely the ones connected to the traffic in the sea, loading and unloading the ship, and environmental threats.

Training and Certification: Companies should make sure the crews are trained and certified as per the safety obligations to them. The process includes regular training and drills.

Internal Audits and Continuous Improvement: The code requires the company to (among other things) undertake internal audits to be able to monitor the SMS's performance and to this end ensure continuous improvement in safety practices [2].

Documentation: The ISM Code regards documents as an important and vital factor. All security policies, procedures, and practices have to be documented and also the info must be available for audit or verification.

In line with these provisions, proper working order, including a safe and reliable navigation system, is to be established with shipping companies adopting the necessary measures both for identifying potential risks and for the constant upgrading of safety methods.

4. Evaluation of effectiveness and challenges in implementing the ISM code

The ISM code's efficacy can be measured by the impact it has had on maritime safety, accident reduction, and the enhancement of e.g. management practices of shipping companies. The maritime industry, since the implementation of the ISM code, has experienced considerable safety management system improvements. Shipping companies are now more liable for their operations, and the compulsory SMS ensures that all safety factors are taken into account [3].

5. Positive Outcomes

Reduction in Accidents: Around the onset of the ISM code provision the critical effort was to minimize safety accidents. Research conducted has shown that the application of safety management systems has accounted for fewer such accidents due to human error, which represented the majority of the cases of maritime incidents. For example, the Herald of Free Enterprise disaster was due to human error and the worrisome absence of safety management, which can be prevented with the code [4].

Environmental Protection: The ISM code has also contributed to better environmental stewardship by the imposition of compliance with international environmental standards and the promotion of environmentally friendly technologies and practices.

Standardization of Safety Practices: The ISM code has set up a harmonized safety management platform for the entire shipping industry. This has led to a more mature safety system on the fleets of most global companies, thus the ships, flying different flags, are adopting the same standards.

6. Challenges

Despite its substantial positive influence, the ISM code has not been free from a few challenges.

Compliance Costs: For example, smaller shipping companies may be constrained in their financial capabilities to adopt the safety management systems that are required by the ISM code. The cost of coming up with, having, and maintaining an SMS can be quite sizable, especially for companies operating an older fleet [5].

Inconsistent Enforcement: Although the ISM code is a mandatory support, there is a great difference among jurisdictions in applying it. Some countries may have weaker enforcement mechanisms, hence, counter-compliance may occur at certain operators, especially in developing countries or areas that have less regulation regarding shipping registries [6].

Complexity of Implementation: The ISM code not only requires carriers to implement safety systems that are both complete and sometimes even intricate but to also manage them following the relevant operational procedures. For smaller companies, especially those with very limited resources, the task of aligning operations with the ISM code's requirements can be overwhelming.

Human Factor: While the ISM code gives utmost importance to human factors and resources, human error is still a main cause of maritime accidents. One of the chief concerns is whether safe work practices are always put into place in a timely fashion, especially in a rapidly changing maritime environment.

7. Predictions for the future of the ISM code

The ISM code is expected to undergo several changes in the future to deal with real-time challenges at sea. Some of the areas where updates might be needed are the following.

Technological Advancements: The ISM code is set to become an efficient document with the increasing use of digital tools such as AI, automation, and data collection in the shipping lines. Besides, the code should contain regulations for the incorporation of such digital technologies into ship management and automation in ships. A category for this could be the establishment of standards for cyber security, the rights of data privacy, and the safe use of automated vessels.

Environmental Sustainability: An increased focus on environmental sustainability and a deep aspiration to reduce carbon dioxide emissions will likely be the main propulsion of the future revision of the ISM code.

Accordingly, as the global environment gets stricter, more regulations may be included in the ISM code, so that the vessels meet the environmental standards that are kept up with the changes.

Human Element in Safety: The development of the ISM code will thus highlight the importance of recognizing that the human element in safety management is the key to the marine industry. Traditional practices like certification and training may need to have more orientation towards the welfare of the crew member, for example, mental health, and fatigue management, which are the cornerstones of human factor/accident reduction on-board.

Global Compliance and Enforcement: The International Maritime Organization (IMO) may strive hard to enforce penalties in the form of fines for shipowners who do not comply with the ISM code to ensure its worldwide implementation. One of the steps that should be considered is more thorough control through audits of ships and tougher penalties if they are non-compliant.

8. Recommendations

Enhanced Training Programs: Training teams that are fundamentally safe for workers must include enhanced training programs, which are focused on skills like decision-making, stress management, and leadership, with technical skills.

Integration of New Technologies: The ISM code is the document that needs to be updated with the pertinent emerging technologies on automation and artificial intelligence because it is the one which has to include the latest updates on cyber security, data protection, and proper use of these technologies to ensure the new gadgets do not become a grave safety issue [7].

Stronger Enforcement: The enforcement of the ISM code shall be enforced aggressively by the insurance provider and the third-party safety management firm which is hereby demanding the same standard to be done by other companies. International cooperation and the threat of heavier fines could make safety-compliant facilities a reality in the future [8].

9. Conclusion

The ISM code has seen a great change in safety in the sea. It has provided a way for shipping companies to safety risks be managed. Also, it has played a significant role in reducing both maritime accidents and marine environmental disasters. Furthermore, the issues of the financial burden, the enforcement, and the human factor, in short, are still in place. Hence, the ISM code is required to adapt to the changes to mitigate risks coming from the development of technology, the stricter environmental regulations, and the new factors brought forth by human beings. Thus, through the improvement of training, the introduction of new technologies, and the intensification of control, the ISM code will result in the worldwide maritime industry being secure.

Disclosure statement

The authors declare no conflict of interest.

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