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Evaluation of the Ism Code in the Finnish Shipping Companies

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ABSTRACT

The number of maritime safety regulations is extensive and an essential part of policy evaluation is to more carefully examine whether maritime safety regulation achieves the goals it is meant to achieve. In this paper we evaluate the effectiveness of the ISM code by using selected literature and the results of an interview study, which was targeted to the Finnish shipping industry. Finally, we make the evaluation and conclusions on the effectiveness of the ISM Code in the light of the criteria for an effective maritime safety policy, which enables the systematic analysis of the strengths and weaknesses of this policy instrument. The main objective of the ISM Code has been achieved in the Finnish shipping industry. Awareness about maritime safety has improved and the requirements of the ISM Code have been implemented effectively. According to the interviewees' opinions, the ISM Code has improved the level of maritime safety. However, comprehending the philosophy of continuous improvement remains to be the main difficulty in the implementation of the ISM Code. Another problem is the lack of uniformity in the interpretation of the ISM Code. The greater challenge in the maritime industry is the excessive bureaucracy that ships have to deal with. Shipping companies could be more spontaneous in developing their safety management practices, and this should also be encouraged by the maritime authorities. In addition, cooperative activities between shipping companies could be launched in order to continuously improve their safety management and performance.

1. Introduction

The safety of maritime operations is controlled in multiple ways and the amount of maritime safety regulation is extensive. New regulations are proposed and developed continuously. However, it is important to take into account the effective output of maritime safety policy instruments in relation to the efforts applied. The worst-case scenario would be a situation where the shipping industry is hindered by excessive rules and bureaucracy, which only have minor real impact on the issues that they are trying to change.

This paper is a qualitative case study of the International Safety Management (ISM) Code as part of the maritime safety policy system. The case study focuses on Finnish shipping companies. The ISM Code was chosen for a deeper analysis because of its purpose to pay wider attention to maritime safety management and culture in the maritime industry instead of just being set of regulations on technical details. When the ISM Code was implemented in the 1990s, it presented a new kind of approach to maritime safety regulation by putting the focus on human factors and safety culture.

The evaluation is done by 1) presenting the qualitative criteria for effective maritime safety policy instruments and 2) evaluating the ISM Code in the light of those criteria first by looking at previous studies on the ISM Code and secondly on the basis of the interview study that was carried out on Finnish shipping companies.

2. Evaluation of the effectiveness of the ISM Code

2.1. Introduction to the evaluation criteria

Kuronen & Tapaninen (2010) have presented the qualitative criteria for effective maritime safety policy instruments. Effectiveness of a policy instrument requires that it must have a positive impact on the matters, which it is trying to change, and that it is not in conflict with the general aims of maritime safety policy and other marine policy. The amount of effort expended in achieving results must be in proportion with the benefits gained. Policy analysis should be based on the analysis of the uses and on the identification and understanding of the demands of the instruments. In addition, potential conflicts and their resolutions should be included into policy analysis (Greiner et al. 2000).

Kuronen & Tapaninen (2010) have combined the criteria for effective policy instruments mainly from two articles of

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Vieira et al. (2007) and Greiner et al. (2000). The criteria provide a comprehensive framework for evaluation. These criteria help to analyze the strengths and weaknesses of a policy instrument.

The qualitative criteria can be used, for example, as a part of Formal Safety Assessment (FSA) method developed by the IMO. FSA can be used as a tool to evaluate new regulations for maritime safety and to make comparisons between existing and possibly improved regulations. FSA doesn't include other evaluation of risk control options than the evaluation of cost-effectiveness (IMO, 2010c).We believe that this is a rather limited point of view and suggest a wider perspective on policy evaluation with the proposed evaluation criteria.

The relevant criteria are shortly described below (Greiner et al. 2000; Vieira et al. 2007):

Effectiveness and appropriateness refers to the possibility of improvement to the matter that is intended to be changed. This relates to whether an instrument is appropriate and technically suitable for achieving the set goal.

Economic efficiency relates to effectiveness in terms of implementation costs of an instrument and the economic efficiency of an instrument in a collective sense, assessing the total benefits of the change in the minimizing of risk against its total costs.

Acceptability refers to the stakeholders' level of acceptance and to the political and communal acceptability of a new policy instrument. Acceptability is a necessary condition for the durability of the policy.

Enforcement indicates how effectively a policy instrument can be implemented. Some instruments can be difficult to implement, even though they would probably be effective. Vieira et al. (2007) present the following types of barriers for implementation: legal and institutional (legal or regulatory conflicts, legal power is divided among various institutions or organizations), resource or financial (lack of financial or physical resources to implement an instrument), political and cultural (some groups oppose the policy) and technological (e.g. lack of suitable technology).

Incentive and innovation effects relate to the question of whether an instrument encourages experimentation and change and provides an ongoing incentive for improvement. (Greiner et al. 2000).

In this study these criteria provide a comprehensive framework for evaluating the impacts and effectiveness of the application of the ISM Code. We conducted a literature review and an interview study where we applied the criteria. We classified the findings in previous literature according to the evaluation criteria. The results of our interview study were interpreted through the framework of the evaluation criteria.

2.2. Evaluation criteria for the effectiveness of the ISM Code

In Table 1 we evaluate the ISM Code with the criteria presented above. Next we look at each criterion using literature on the ISM Code.

3. Evaluation of the ISM Code in the literature

3.1. The effectiveness of the ISM Code

The primary goals of the ISM Code are to improve maritime safety and prevent environmental damages. The literature review of previous studies concerning the ISM Code has showed that the ISM Code has contributed significantly to the progress of maritime safety in recent years. The operations of shipping companies and crews are more environmentally friendly and more safety-oriented than in the 1990s. According to ConsultISM Ltd. (2008), there is a common consensus regarding the positive contribution of the ISM Code to the maritime safety.

Nevertheless, the direct effect and influence of the ISM Code on maritime safety could not be precisely isolated, for example from the effect of fleet renewal on safety. No quantitative study (based on the statistics/hard data) could be found to describe the impacts of the ISM Code on maritime safety. (Mejia, 2001; Anderson, 2003; IMO, 2005, ReportISM 2008).

Criterion	*Common description*	*Measurement related to the ISM Code*
Effectiveness and appropriateness	The policy instrument must be suitable for achieving a desired goal	The ISM Code has enhanced maritime safety and the protection of the marine environment
Economic efficiency*	The benefits versus the costs of implementing the policy instrument should be in balance	Cost/benefit analysis of the implementation of the ISM Code
Acceptability	The policy instrument must be accepted by the stakeholders and the community	Management commitment Maritime personnel commitment
Enforcement	The policy instrument can be implemented effectively	Barriers for effective implementation The role of the Administration Effectiveness of the ISM Audits
Incentive and innovation effects	Instrument encourages experimentation and change and provides an ongoing incentive for improvement	Continuous improvement of safety Spontaneous development of safety in shipping companies

Table 1. Evaluation criteria for the ISM Code (*evaluation of the economic efficiency is not included in this study).

3.2. Acceptability of the ISM Code

The commitment of the top management is referred to as one of the main requirements for a successful implementation of a safety management system. Anderson (2003) recognised that some shipping companies prefer short-term profits at the expense of maritime safety. The Paris MoU (2008) reported the result of the Concentrated Inspection Campaign focused on the functioning of the ISM Code that 176 ships were detained due to serious deficiencies against the requirements of the ISM Code. The reason for these detentions was a serious neglect of the maintenance of the ship and its safety equipment. The state of emergency preparedness was poor as well. The report of the Paris MoU (2008) concluded that the top management of the poorly performing shipping companies were not committed to safety issues at all.

Hahne et al. (1999) analysed the prevailing safety culture in the late 1990s. The purpose of the study was to pinpoint the problematic areas encountered with the implementation of the ISM Code. Researchers came to the conclusion that the main obstacle to the successful implementation of the ISM Code was the widespread resistance by the seafarers to the *obligatory* establishment of the safety culture. According to Hahne et al. (1999) the maritime industry was not ready for the ISM Code at that time.

3.3. Enforcement of the ISM Code

Pun et al. (2002) discovered the problems and difficulties which have appeared in the implementation phase of the ISM Code. According to Pun et al. (2002), the most difficult problems were:

- Resistance to change
- Lack of human resources
- Insufficient knowledge of procedures
- Lack of inter-departmental communication
- Low level of education
- Frequent staff turnover
- Time pressure to obtain registration of the SMS

Pun et al. (2002) considered that these problems resulted from a mismatch between the prevailing organizational culture and the requirements of the ISM Code. The culture of the organization did not support the safety oriented culture which is required to apply the ISM Code successfully.

Anderson (2003) also listed problems and difficulties with the implementation of the safety management system. Anderson identified certain common factors for the unsatisfactorily implemented safety management systems. Anderson found out that there was too much paperwork due to voluminous documentation; a typical situation when a company has bought an off-the-shelf safety management system. Many irrelevant procedures and checklists are involved in these systems. In these cases, safety management was usually realized through paperwork and the personnel could not develop any feeling of involvement in the system. The company did not provide support for the personnel. The vessels suffered from a lack of resources and insufficient training and therefore were not able to meet the new requirements of the ISM Code. As a consequence, the motivation for safety management of the personnel was low. (Anderson, 2003).

Attention has also been paid to the turnover of the personnel. Establishing a safety culture is not easy when the turnover of the crew is high. Too often, the new employee has been familiarized too poorly. (Anderson, 2003; Pun et al. 2002).

On the other hand, Anderson (2003) also identified the success factors of a very well functioning safety management system, requiring for example:

- Leadership and commitment from the top management
- A sense of ownership of the safety management system for the personnel
- Good communications between ships and office
- The reduction of paperwork to manageable levels.

3.4. Incentive and innovation effects of the ISM Code

The fundamental principle of the ISM Code is the idea of continuous improvement. Investigating incidents is an integral component of a continuous improvement process in safety management systems. Learning the lessons from incidents should help to improve safety performance (IMO, 2008). The ISM Code requires that the shipping companies establish procedures, which ensure that non-conformities, accidents and hazardous occurrences are reported to the company. Naturally, the companies should ensure that corrective and preventing actions are implemented (IMO, 2010b). Furthermore, the IMO has emphasised the importance of continuous improvement by providing guidance on near-miss reporting. According to the IMO, investigating near-misses is an integral component of continuous improvement in the safety management system (IMO, 2008). Also Anderson (2003) emphasises that a properly working reporting process is a clear indication of continuous improvement. The referred studies show that the most serious shortcomings concern the process of continuous improvement and incident reporting. Several studies have concluded that incidents are not perfectly reported. Mariners are still reluctant to expose their mistakes. (Mejia, 2001; Anderson, 2003; IMO, 2005, Ek & Akselsson, 2005).

According to Mejia (2001) willingness to report is an indication of whether the ISM Code is functioning as it should. The Paris MoU (2008) reported that one of the most common ISM-related deficiencies was the lack of reporting nonconformities, accidents and hazardous occurrences. The main focus Anderson's study (2003) was to investigate how the incidents, near-misses and other hazardous occurrences were reported. Also he discovered that the reporting of incidents was quite insufficient among the seafarers. Especially the minor incidents were not regularly reported. Anderson was particularly surprised that most of the seafarers were more or less reluctant to report the incidents. Furthermore, Anderson discovered that in certain cases, further analysis of and corrective actions on the reported incidents were not properly carried out. According to Anderson in these circumstances the process of continuous improvement does not work properly. (Anderson, 2003).

4. Interview study concerning the impacts of the ISM Code in Finnish shipping companies

In this chapter we present the considerations of Finnish mariners, shipping companies and other maritime stakeholders concerning the impacts of the ISM Code on maritime safety.

In the study, a total of 94 people were interviewed between 2008 and 2009. All those who were interviewed were actively working in the Finnish shipping sector. Almost all had a maritime education and maritime working experience. All of the interviewees had worked with the ISM Code based safety management system. Almost all were Finnish citizens. Seven shipping companies were involved in the study, which widely represent the Finnish shipping business. All important shipping business areas were represented.

The interviewed maritime personnel (62 persons) were active seafarers such as masters, deck officers, engineering officers, deck hands and engineering operators, and hotel and catering staff. The management group (14 persons) includes safety managers (DPAs) and managing directors of the shipping companies. Almost all the interviewees in the management group had previously worked at sea and had applied the ISM Code in practice.

We also interviewed maritime inspectors and officers (12 persons) from the Finnish Maritime Administration (FMA) (current Finnish Transport Safety Agency TRAFI).The maritime inspectors are responsible for conducting external ISM Audits in shipping companies and on vessels. In addition, these inspectors were responsible for carrying out the Port State Control inspections of foreign ships visiting Finnish ports.

We also interviewed representatives from the Accident Investigation Board Finland and the Finnish State Pilotage Enterprise (8 persons). These interviewees are involved in safety management on a daily basis. They have a comprehensive idea of the current safety level of the Finnish shipping business due to their close co-operation with Finnish shipping companies and their personnel.

4.1. Methodology of the interview study

The impacts of the ISM Code have been looked at in several international studies. Most previous studies regarding the impacts of the ISM Code have been based on quantitative methods, such as structured questionnaires, the results of which were analysed statistically. The number of participants was high. Although many of these studies are not presented in scientific literature, we regarded the results of previous studies as more or less representative when providing a general picture of the effects of the ISM Code. (Pun et al. 2002; Anderson, 2002; Othman, 2003; IMO, 2005, Paris MoU, 2008).

The main merits of previous quantitative studies are: The scope of previous studies has been global, the results of earlier studies reinforce the public impression that the ISM Code has mainly achieved its objectives and that the majority of the world's maritime industry supports the ISM Code, difficulties and deficiencies in the implementation of the ISM Code were also uncovered and subjects for further research were proposed.

In order to supplement the knowledge about the area of study we chose thematic interviews (Hirsjärvi & Hurme, 2008) and qualitative analysis (Alasuutari, 1995). The interview sessions were structured as discussions where the interviewees were encouraged to express themselves freely in order to find out the most important issues from their point of view. A semi-structured questionnaire was provided in order to assist and serve as a reminder to the interviewer. The questionnaire consisted of questions analysing the main research themes and gathering background information on the interviewees and their employees.

The main themes of the interviews dealt with the factors that IMO (2010b) considers the factors for good safety culture: management commitment, involvement of maritime personnel and continuous improvement. Questions also explored the opinions of the interviewees about the benefits and defects of the ISM Code and the significance of the ISM Code to the maritime safety.

The main themes of the interviews were discussed similarly with each interviewed group in order to find out possible contradictions and inconsistencies between the answers of each group. For example, company management groups were asked how they support the personnel in safety issues and give feedback on safety issues. Correspondingly, the personnel of the vessels were asked what kind of support and feedback concerning safety issues they have received in practice. The motivation and involvement of the personnel were studied for example by asking: how do the personnel and officers communicate in safety issues? How do the personnel make proposals concerning safety issues? In order to evaluate the processes of continuous improvement, the interviewees were asked how incidents and near-miss situations are reported and analysed in a company and how corrective actions are performed. In addition, the designated persons (DP; safety managers of shipping companies required by the ISM Code) were asked about the numbers of reported incidents per year and per vessel.

4.2. Appraisals of the current safety level of Finnish shipping industry

In order to evaluate how the ISM Code has achieved its targeted objectives, the interviewees were asked about their views on the safety level of Finnish shipping industry. The interviewees were also asked what they consider is the role of the ISM Code when improving and developing safety level onboard. At this point it should be stressed that this chapter presents the views of the interviewees on the safety level of Finnish shipping industry and that the study does not include analysis about the actual safety performance of the shipping companies (based on e.g. accident statistics or other hard data).

The management of the shipping companies were asked what the target level of safety in their companies was and whether they had achieved this safety level. The answers of the managers were mirrored with the answers of the maritime personnel and the maritime inspectors in order to find any contradictions between the appraisals.

Typically, the safety goals of the shipping companies were introduced in general terms. The common goal of the companies' safety management was to take proper care of environmental and safety issues. The usage of a quantitative measurement of the safety level was not very common among the shipping companies.

Because of the lack of specific safety goals, we asked the management to evaluate their companies' safety levels by comparing their safety level to that of other shipping companies. Typically the managers considered that their companies had achieved a good safety level and the application of the SMS has had an important role when developing safety onboard. Some managers reported their safety goal was to be one of the best shipping operators when compared with other Finnish, or even European, shipping companies. The appraisals about the safety level of the managers were more or less unwritten estimations. All of these estimations should be regarded as conjectural. No specific methods to make comparisons between shipping companies were applied.

The masters, officers and other crew members were asked about their opinions of their employer's safety level. Most of the masters considered that the shipping companies, which were employing them, had achieved a very good safety level. The estimations of other personnel were similar to those of the masters. The other officers and crew members considered that the safety levels were at least average in their companies. None of the interviewees believed that the safety levels of their employers were poor. Some of the masters, officers and crew members added that their companies required a higher safety level on the ships than could be regarded as reasonable.

The maritime inspectors estimated that the safety levels of Finnish shipping companies have been relatively high in recent years. The maritime inspectors were particularly satisfied with the progress in safety made by larger shipping companies and companies engaged in passenger traffic. Some inspectors felt that there have been shipping companies with a poor safety levels. Fortunately, these "black sheep" were individual cases.

The public administration has not utilised any statistical measurements in order to evaluate the safety level of Finnish shipping companies. The only available statistics were provided by the Paris MoU. The Paris MoU has provided statistics on deficiencies found in Port State Controls. These statistics have showed that Finnish vessels have had very few deficiencies and detentions, which indicates that Finnish shipping companies have achieved a good safety level (Paris MoU, 2010).

Although it is unlikely that a shipping company would admit that its safety level is poor and from this perspective the responses can be considered predictable, the unanimity of the all interviewed parties about the good safety level in Finnish shipping industry indicates that it actually is good. Also the Paris MoU (2010) statistics support the conclusion.

4.3. The benefits of the ISM Code (Table 2)

The opinion that the ISM Code has been useful in general was expressed in several ways by the interviewees. The interviewees said that the ISM Code has improved the safety level of the maritime industry, the maritime culture has changed and become more safety oriented, and the personnel's safety attitudes as well as safety awareness have improved. One manager pointed out that shipping companies were not willing to give up their safety management systems anymore, because they have provided economic benefit for the company and facilitated the general management of the company. Some interviewees reported that the ISM Code has influenced their daily practices.

The interviewees regarded it as a benefit of the ISM Code that co-operation between the shore and shipboard personnel has improved due to improved communication. Information between the shore and the ships flows more easily nowadays. The ISM Code has provided useful tools for reporting safety aspects from the ship to the company's office. Co-operation between personnel groups onboard, likewise, has improved. Onboard safety meetings have been arranged regularly. Information has been shared between ships in the company's fleet.

The roles and responsibilities of the personnel have been clarified due to well-defined documentation. The personnel have been better aware of their duties. Especially the division of responsibilities in emergency situations have been clarified. The documentation has provided practical information about different tasks and operations.

The interviewees said that the application of the ISM Code has harmonized the instructions and operations, and this has for example eased transfers of personnel between the company's ships, and it has improved the quality of maritime operations. Similarly, uniform instructions have helped the familiarization of new personnel. Some interviewees mentioned that safety management systems have helped the familiarization of new crew members. The new crew members could easily find about their tasks and responsibilities in the documentation.

One fact considered important by the maritime personnel was that the ISM Code has placed formal requirements at the company. According to some interviewees, the company's responsibility for safety issues has improved maritime safety. The personnel's perception of the company's explicit will to safety can be considered yet another benefit. The company has had to react to reported safety defects and problems. Safety flow of information to the top management of the company has improved. The company has been forced to operate safely.

Benefits
— The ISM Code has improved the overall safety level
— Heightened safety awareness among the maritime personnel
— Improved co-operation and communication between the shore and shipboard personnel and between personnel onboard
— Well-defined roles and responsibilities
— Improved quality of maritime operations
— Harmonized instructions and easier induction training
— Formal requirements set for the company

Table 2 Benefits of the ISM Code in Finnish shipping companies

4.4. Defects of the ISM Code (Table 3)

Most of the interviewees felt that the ISM Code itself has no considerable defects and there was no need to change the Code. Nevertheless, the application of the ISM Code was considered inappropriate. According to many interviewees, one of the major defects of the application of the ISM Code is the increasing paperwork and bureaucracy. Some interviewees reported that the safety management system has encumbered the maritime personnel with unnecessary official procedures. The reporting procedures were considered too complicated and cumbersome.

Many interviewees stated that the safety management system has been made too complicated. The instructions were too detailed. The documentation did not correspond with the actions. There have been problems in following the instructions of the safety manuals. No room is left for common sense and situational sensitivity. The complex safety manual stops the employees from acting rationally.

Many interviewees considered that safety management system documentation should be simplified. Streamlined documentation could mean that the system would be utilised better. The basic principle should be that the documentation corresponds with real operations onboard. Some interviewees added that there had been cases where the safety documentation had been relaxed and streamlined, which made it more usable. In addition, some interviewees considered that regularly updated documentation is a good indicator of a functioning safety management system.

The practical aspects of the ISM Code should be developed. According to seven interviewees, guidance should be provided to the application of the Code. Practical examples of successful implementations of the ISM Code should be provided. One interviewee suggested that the best practices of safety management should be disseminated to the entire maritime industry. The public administration should provide interpretations of the Code requirements.

Defects
— Burden of bureaucracy
— Complicated documentation of the management system
— Lack of guidance in application of the Code
— Lack of suitable safety performance indicators
— Non-uniform interpretation of the requirements

Table 3. Defects of the ISM Code in the Finnish shipping companies

4.5. Management commitment

The representatives of the management assured that their companies take safety and environmental issues seriously. Some managers felt that safety oriented operations were an integral part of profitable business. The managers cited some practical examples of how they have supported and encouraged maritime personnel in safe operation. The management could demonstrate their support by communication, by visiting onboard ships and by participating in ISM audits, by giving feedback and by reacting to any non-conformities and safety initiatives. Some managers expressed some criticism about the commitment of the top management to safety. They felt that sometimes the company did not provide the funds for necessary safety improvements due to economical reasons.

Respectively the maritime personnel were asked how the management supports the personnel in safety issues and how the management gives feedback about safety issues. In addition, they were asked whether there have been any contradictions in the manifestations of the company's safety policy regarding goals, measures and values and the actual management practices.

The maritime personnel mostly felt that the commitment of the management to safety issues has improved. Some interviewees mentioned that the basic way to support the vessel in safety issues is to provide financial resources when needed. These interviewees said that the top management does provide money or other resources for safety investments, particularly if the need is well-founded. The personnel felt that the management has supported reasonable safety initiatives. Many of the interviewees could not see any contradictions between the company policy and the actual practices (typically investments in safety improvements) of the management.

Some of the interviewees expressed a critical opinion. They told that for financial reasons, even well founded improvements had sometimes been rejected. One officer criticized the fact that there were not enough human resources to update and renew the safety management system. One interviewee added that the management had been satisfied with and interested in nothing but the maintaining the minimum safety level, ensuring that the ISM audits were passed and certifications remained valid.

The common view of the maritime inspectors was that the top management of Finnish shipping companies was highly committed to safety management. They felt that a practical way to support and encourage the personnel is to participate in the ISM audits.

According to maritime inspectors, there are shipping companies where the top management should pay more attention to safety. The management of these companies has not been committed enough to safety. Typically, these shipping companies were quite small and had a small staff. The maritime inspectors said that there has been a lack of competent personnel in smaller shipping companies.

4.6. Commitment of maritime personnel

According to many interviewees, the safety management system faced resistance during the implementation phase and in the early years of the ISM Code. The interviewees described the reluctance of people when they felt their professional pride was discredited. People felt that they had managed to do their jobs without red tape because they were professionals. Because they considered themselves professionals, they regarded the safety manuals as useless. This resistance has weakened in the last decade. According to some interviewees, the reason for this is that the systems have been developed to become

user-friendlier, and the documentation has been lightened and streamlined. The new generation of maritime personnel regards safety management as an integral part of their work. They have been educated in ISM issues during their studies at maritime institutes.

The maritime inspectors had also recognised the adverse attitudes of maritime personnel in the early days of ISM implementation. They said that the maritime personnel had felt that the administration was only trying to annoy them with their bureaucratic requirements. Maritime personnel were also afraid that their workload would become excessive and that the safety management system would burden them with useless practices, such as checklists and reporting.

According to maritime inspectors the attitudes of the maritime personnel have improved a lot in recent years. According to inspectors, the maritime personnel have internalized the principles of safety management and they apply the instructions of the safety management system in their daily operations.

4.7. The effectiveness of ISM audits

The views on the ISM audits were partly diverging. The maritime inspectors themselves were not fully satisfied with the competence of the Finnish Maritime Administration (FMA) to carry out the ISM audits. The inspectors said that there is room for improvements in the work of the Administration. Inspectors felt that the manner in which the audits are carried out and the results of the audits depends too much on the personal competence of the inspector. The FMA utilizes a quality system in their operations. According to two inspectors, what is required by the quality system and what takes place in actual operations do not always correspond with each other.

In general, the maritime personnel considered that the ISM audits executed by the FMA have been objective. The inspectors of the FMA were commended for having a broad scope when auditing or inspecting safety onboard. The inspectors have used common sense and focused on relevant issues during the audits, i.e. the safety management system as a whole.

Maritime personnel considered that the ISM audits carried out by the Administration were useful. According to the maritime personnel external auditors observe safety management on the vessel from a new perspective. The auditors found issues, which should be improved. The personnel of the vessel had to be prepared for the audits and revise the manuals in order to pass the audit. The company had to respond to any non-conformities found in the audits and to carry out corrective actions.

Some interviewees pinpointed several deficiencies in the ISM Audits. These interviewees felt that the differences in the ways the audits are carried out are too great depending on the personal skills of the maritime inspector. The inspectors tend to interpret the requirements of the ISM Code variedly. Some interviewees characterized certain inspectors as nitpickers. Other interviewees said that the auditors set out specifically to find faults and errors.

The interviewees suggested some improvements that should be implemented for the ISM Audits. The maritime inspectors should have audit training, which should concentrate on the uniform interpretation of the ISM Code requirements and other rules. In addition, the maritime inspectors should focus on supporting and encouraging continuous improvement.

4.8. Continuous improvement and spontaneous development of safety in shipping companies

In order to evaluate the processes of continuous improvement, the interviewees were asked the question: how are incidents and near-miss situations reported and analysed in your company, and how are corrective actions performed? In addition, the safety managers were asked about the numbers of reported incidents per year and per vessel. The designated persons were asked about the existence of quantitative targets, indicators or usage of statistical methods for evaluating the safety performance of the company.

The safety managers (DP's) and the masters of the vessels were asked about the number of reported incidents and near-misses per year. The average number of reported incidents and near-misses varied greatly depending on the vessel. Typically, the number of written reports was low; just a few reports per year and per vessel. On some vessels, only 1 to 3 cases were reported per vessel per year. In some vessels, the reported number was as high as 20-30 incidents per year per vessel.

The interviewees shared a common opinion that incidents are reported defectively. Regardless of how many incidents were reported per year, the majority of the interviewees held the view that compliance to report incidents should be improved. However, some interviewees considered that over-reporting occurs. According to the interviewees, the reason for over-reporting was a system that rewarded active reporting. These interviewees said that there also have been cases where under-reporting was apparent.

Also the maritime inspectors thought that the incident reporting was not without problems. Many maritime inspectors brought up poor incident reporting by crewmembers. According to the maritime inspectors, the ISM Code has not been successful in that respect. Especially the older seafarers have often neglected to report incidents. The ratings and hotel and catering staff do not report incidents at all. Some maritime inspectors supposed that maritime personnel undervalue the significance of incident reporting. In such a case, the negligent person has not understood what positive effects incident reporting could have on maritime safety.

When executing an ISM Audit in a shipping company, the maritime inspectors go through the reports of internal audits and records of non-conformities, accidents and hazardous situations. They considered that very few incidents were reported per vessel and per year. Some inspectors added that the scarcity of reported situations was dubious, implying that many situations were left unreported.

The inspectors that were interviewed consider that those ships that reported the largest numbers of incident were the

safest ones. The large number of reported incident shows that these ships and companies are interested and willing to learn from their mistakes and to develop their operations to a safer direction.

The inspectors considered that poor reporting practice is also a problem at the international level. The interviewees said that this does not depend on the nationality of the ship. Their shared opinion of foreign ships was no better than that of ships under the Finnish flag.

Reasons for this unwillingness to report were mentioned. Some interviewees thought that often people do not want to admit that something goes wrong. One interviewee told the researchers that some masters discourage reporting because they think that no incidents should take place on their ship. Especially older seafarers considered that minor incidents should not be reported, as they felt this was an unnecessary bureaucratic procedure.

According to some interviewees, minor mistakes and all technical problems are reported due to the fact that the management wants to be informed of such occurrences, but mistakes that cause near-accident situations are not reported unless this is obligated by the circumstances. One interviewee added that when a close shipmate makes a mistake, they usually fail to report it. People are reluctant to put blame on their shipmates. However, when a foreign ship has caused a near-miss situation, the report of this incident is much easier to compose.

Notwithstanding, some interviewees thought that unreported incidents and near-miss situations are discussed onboard. Improvements are made, although written reports do not exist. One maritime inspector also believed that corrective actions have been executed onboard quietly without official reporting.

Some mariners felt that the concept of incident was not specific. They suggested that the descriptions of non-conformities, accidents and hazardous situations should be clarified and standardized in the maritime industry.

4.9. The ISM Code in the light of criteria for effective policy instruments

Effectiveness and appropriateness

The analysis of previous literature showed that the application of ISM Code in the shipping industry has significantly improved maritime safety in recent years (see also: Lappalainen, 2008). Shipping companies are more environmentally friendly and more safety-oriented than before the ISM Code was established.

What is more, our interview study indicates that the safety level of the Finnish shipping companies has improved during recent years. The managers of the shipping companies and the maritime personnel assured that their companies have achieved a good safety level. The maritime inspectors also considered that the safety level in the Finnish shipping industry is good. According to the interviewees, the application of the ISM Code has been a large contribution to positive development of the safety level. From that point of view the results of the interview study supported the conclusions of the previous studies.

However, both the literature review and the interview study showed that there is a lack of accurate statistical data, which could be applied for quantitative analysis of the effectiveness of the ISM Code. Only a few Finnish shipping companies have systematically collected statistic data in order to evaluate their safety level. Also Anderson (2003) and the IMO Group of Experts (IMO, 2005) concluded that there is lack of hard data. The direct effect and influence of the ISM Code on maritime safety could not be very well isolated (Anderson, 2003; IMO, 2005; Paris MoU, 2008).

Acceptability

The results of the interview study emphasised that the Finnish maritime industry is highly committed to safety management. In most cases, the top management of shipping companies are committed to the safety and regard safety as a valuable asset. The attitudes of the maritime personnel have greatly improved. For example, maritime personnel have internalised the principles of safety management and they apply the instructions of the safety management system to their daily operations.

In the light of the interviews we can conclude that the resistance towards the ISM Code and the safety management, which w as reported, by Hahne et al. (1999), Anderson (2003) and Pun et al. (2002) has decreased significantly since the introduction of the ISM Code.

Enforcement

The literature review showed that the application of the ISM Code has required too much paperwork and bureaucracy. The literature review also showed that the interpretation of the requirements is not uniform and there is a lack of practical guidance in the application of the ISM Code.

The interviewees named similar defects in the ISM audits: they felt that the differences in the ways the audits are carried out are too great, depending on the personal skill of the maritime inspector. The inspectors tend to interpret the requirements of the ISM Code differently. Even the representatives of the Finnish Maritime Administration admitted that the inspectors have interpreted the requirements of the ISM Code differently.

Incentive and innovation

Both the reviewed literature and the results of the interviews showed that the process of continuous improvement is not working well. Several previous studies found insufficiencies concerning incident reporting, which is the primary method of continuous improvement provided by the ISM Code (Hahne et al. 1999; Paris MoU, 2008; Withington, 2006).

The interview study showed that the maritime personnel's attitudes towards incident reporting were unsatisfactory. The mariners admitted that reporting is often neglected. The low number of reported incidents supports this conclusion. In spite of the fact that some interviewees felt that apparent over-reporting has sometimes occurred, the under-reporting of incidents is a much more serious problem.

There are also other useful tools for the implementation of continuous improvement in addition to incident reporting. There are, for example, procedures for internal audits and reviews. The functioning of these other tools was not examined either in this study or in the previous studies.

5. Summary and conclusions

In this paper we have evaluated the effectiveness of ISM code in the Finnish shipping industry. We found out that the requirements of the ISM Code have been implemented effectively in the Finnish shipping industry. The management and the personnel of the shipping companies have accepted the ISM Code as an essential safety measure. However, the comprehension of the philosophy of continuous improvement remains to be the largest problem. Tools for continuous improvement should be developed and applied into practice. Another problem is the lack of uniformity in the interpretation and implementation of the ISM Code. The greater challenge in the maritime industry is the excessive bureaucracy ships have to deal with.

Although attitudes in the maritime industry towards safety issues seem to have improved, the old-fashioned safety culture still prevails. For example, there is reluctance to report about safety risks and small incidents or the ISM Code is implemented and audited only to the level at which the formal requirements are fulfilled. In our opinion, shipping companies should be more spontaneous in developing their safety management practices. Co-operative activities of the shipping companies could be launched in order to continuously improve their safety performance. Moreover, authorities could encourage shipping companies to spontaneously improve safety management by e.g. spreading the word about best practices, instead of just checking if the minimum requirements are fulfilled.

Thematic interview and qualitative analysis were chosen as the research methods for this study. The interview themes were handled similarly between the interviewed groups so the possible contradictions and inconsistencies between the groups could be found out. It is notable that the answers of different groups were quite compatible. The opinions of the management were supported by the personnel and vice versa. Neither of the opinions of the officials (maritime inspectors, accident investigators and pilots) contradicted each other. No critical contradictions were found between the interviewed groups. The number of interviews was quite extensive for the thematic interview. In addition, the group of the shipping companies represented Finnish shipping companies well. Considering this, the results of the interview study were quite representative concerning the whole Finnish shipping sector. As a first of a kind in Finland, the study brought out important information about the successfulness of the application of the ISM code in the Finnish shipping industry. The results can be expected to apply to similar shipping nations as Finland with regard to the safety performance. Flags with poor safety records (e.g. flags in the black list of the Paris MoU) would probably require a separate study.

When we compare the results with the previous studies concerning the impacts and effectiveness of the ISM Code, this study strongly supports the findings of those previous studies. However, this study found some new aspects to enhance the benefits of the ISM Code. For example, the authorities should take a stronger role in supporting and encouraging spontaneous and innovative safety development in the maritime industry. This aspect is also related to the enforcement criterion. In addition, the shipping companies could co-operate more with each other in order to improve innovativeness in safety development. Both the authorities and the shipping companies should pay more attention to quantitative and statistical methods for the monitoring of safety performance at company and industry level. We also found out that there are no feasible ways of evaluating the economic efficiency of the implementation of the ISM Code, because systematic methods for recording safety costs are not utilized in the shipping industry.

The qualitative analyses concerning the ISM Code have been uncommon on the international and scientific level. Benefit of the qualitative study is that it enables to analyze a policy instrument comprehensively, taking into consideration many types of data. The evaluation criteria for maritime safety policy instruments provided a robust framework to evaluate the impacts of the ISM Code in many respects and to bring out essential points from the vast amount of interview material.

It is often expressed that the most important cause for accidents at sea is human factor. It is unlikely that errors caused by human factors can be "corrected" with same kind of regulation and supervision as technical faults and weaknesses. That is why it is of greatest importance that such regulations as the ISM Code exist, bringing attention to human actions. In order to get maximum benefit out of the ISM Code, the ways how the spontaneous and continuous improvement of safety could be encouraged in the shipping companies by the means of the ISM Code should be studied further.

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