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FINNISH MARITIME PERSONNEL'S CONCEPTIONS ON SAFETY MANAGEMENT AND SAFETY CULTURE

Jouni Lappalainen

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University of Turku

Faculty of Mathematics and Natural Sciences
Department of Geography and Geology

Supervised by

Ph.D., Docent Ulla Tapaninen
Department of Geography and Geology
University of Turku,
Turku, Finland

Ph.D., Professor Pentti Kujala
Department of Applied Mechanics,
Aalto University,
Espoo, Finland

Reviewed by

Ph.D., Head of Marine Systems Department
Robert Aps
Estonian Marine Institute
University of Tartu,
Tallinn, Estonia

Ph.D., Research Director Stian Antonsen
SINTEF Technology and Society,
Safety Research Department,
Trondheim, Norway

Opponent

Ph.D., Professor Jens-Uwe Schröder-Hinrichs
World Maritime University
Malmö, Sweden

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ABSTRACT

The purpose of this thesis is to explore Finnish maritime personnel's conceptions of safety management and its relationship with the concept of safety culture. In addition, the aim is to evaluate the impact of the ISM Code on the prevailing safety culture in the Finnish shipping business. A total of 94 interviewees and seven Finnish shipping companies were involved in this study. Thematic interviews were applied as the main research method for the study. The results were analysed qualitatively.

The results indicate that maritime safety culture can simultaneously demonstrate features of integration, differentiation and ambiguity. Basically, maritime personnel have a positive attitude towards safety management systems since they consider safety management beneficial and essential in general. However, the study also found considerable criticism among the interviewees. The interviewed maritime personnel did not criticise the ISM Code as such, yet they criticised the way the ISM Code has been applied in practise.

In order to understand the multiple perspectives of safety culture more comprehensively, multiple theoretical perspectives and methodological approaches are needed. This study indicates that safety culture and the impacts of the ISM Code should not be unambiguously studied solely quantitative methods or qualitative methods. By examining safety culture from several methodological and theoretical perspectives, one may gain a more versatile and holistic overview of safety culture.

Keyword: Maritime Safety, Safety Management, Safety Culture, the ISM Code

TIIVISTELMÄ

Tässä väitöskirjassa tarkastellaan suomalaisten merenkulkijoiden käsityksiä turvallisuusjohtamisesta ja sen suhdetta turvallisuuskulttuuriin. Lisäksi arvioidaan kansainvälisen merenkulun turvallisuusjohtamiskoodin (ISM-koodi) vaikutusta turvallisuuskulttuuriin suomalaisissa varustamoissa. Tutkimusta varten haastateltiin 94 merenkulun piirissä toimivaa henkilöä. Tutkimukseen osallistui seitsemän suomalaista varustamoa. Pääasiallisena tutkimusmenetelmänä käytettiin teemahaastatteluja, joiden tulokset analysoitiin laadullisesti.

Tutkimus osoitti, että turvallisuuskulttuurissa voi esiintyä samanaikaisesti yhdenmukaisia, erityviä sekä monimerkityksisiä piirteitä. Lähtökohtaisesti haastateltavat suhtautuivat myönteisesti turvallisuusjohtamiseen ja näkivät turvallisuusjohtamisjärjestelmät hyödyllisinä ja jopa välttämättöminä. Kuitenkin, tutkimus paljasti myös voimakasta kritiikkiä turvallisuusjohtamista kohtaan. Varsinaisesti ISM-koodia ei kritisoitu mutta sen soveltamisesta käytäntöön ei oltu tyytyväisiä.

Tutkimus osoitti, että turvallisuuskulttuurin kokonaisvaltaisempi ymmärtäminen edellyttää useamman eri teoreettisen näkökulman ja laajemman menetelmäsalkun hyödyntämistä. Turvallisuuskulttuurin ja ISM-koodin tutkimuksessa ei pidä tyytyä pelkästään määrällisiin menetelmiin tai pelkästään laadullisiin menetelmiin vaan näitä yhdistelemällä voidaan saavuttaa laajempi ymmärrys turvallisuuskulttuurista tutkimuksen kohteena.

Avainsanat: Merenkulun turvallisuus, Turvallisuusjohtaminen, Turvallisuuskulttuuri, ISM-koodi

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To my departed, beloved wife

It took about nine years to finish this project. I started to plan my doctoral thesis in August 2007. The period has been eventful. The project interrupted for several reasons for several times for a shorter or a longer period. However, the project is now about to end and it is time to express my gratitude to all the people whose support and contribution have made possible reaching the finish line.

At first, I want to thank my supervisors Ulla Tapaninen and Pentti Kujala who helped me to find an interesting research theme which woke my enthusiasm to last for a long time. In addition, I am grateful to them for their constant encouragement and support during these years. Thanks to Seppo Hölttä for his invaluable and friendly consultation for my manuscript.

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Kerava, 29 April 2016

Jouni Lappalainen

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1 INTRODUCTION

The purpose of this thesis is to explore the Finnish maritime personnel's conceptions of safety management and its relationship with the concept of safety culture. This thesis is a contribution to the geographical studies of organisation (see, for example, Del Casino et al. 2000; Audia, 2015; Müller, 2015) and the geographical studies of ships (see, for example, Hasty & Peters, 2012; Anim-Addo et al. 2014).

1.1 Background

Over twenty years has passed since the Ro-Ro ship Estonia capsized and sank 28th September 1994. Yet, the accident seems to resurface in the media near the anniversary days (Iltalehti 22.9.2014; Kaleva 27.9.2004; Savon Sanomat 28.9.2008; Tekniikka ja talous 28.9.2009) The accident caused a national trauma, particularly in the vessel's flag state Estonia and in Finland and Sweden. Most of the passengers were from these countries and the most of the crew members were Estonian (JAIC, 1997).

The accident was investigated thoroughly by the Joint Accident Investigation Commission[1] (JAIC, 1997). The accident investigation and related scientific studies revealed several problems within the safety culture of the maritime industry (Hänninen, 2007; Kristiansen, 2005).

The accident of Estonia was not the first fatal accident drawing attention to inadequate maritime safety culture. The accident investigations of the Herald of Free Enterprise and the Scandinavian Star revealed fatal problems within the maritime safety culture as well (Department of Transport, 1987; Robinson, 1999; Kristiansen, 2005). In the investigations it was concluded that the shipping companies operated in a competitive manner and aimed to maximise their profits at the expense of safety. Safety culture deficiencies were found amongst the shipping company management as well as ship

[1]A "Joint Accident Investigation Commission" between Estonia, Finland and Sweden for the investigation of the capsizing of the passenger vessel MV ESTONIA on 28 September 1994 was set up on 29 September 1994. The Commission consists of three members from each state and was chaired by one of the members from Estonia, the flag state of MV ESTONIA.

crews. The accident investigations revealed that the management were not committed to safety and the crew members were not participative in relation to safety (Department of Transport, 1987; Robinson, 1999; Kristiansen, 2005; Gill & Wahner, 2012). According to Hänninen (2007), the shipping companies and the shipping industry were not capable of executing corrective measures due to the fact that the risk handling measures and the risk management systems were underdeveloped within the maritime industry (Hänninen, 2007; see also Gill & Wahner, 2012; Hystad & Bye, 2013)

As a reaction to these serious maritime accidents and other problems within safety culture, the IMO enacted the International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code) (Schröder-Hinrichs et al. 2013; Hystad & Bye, 2013; Xue et al. 2015). The ISM Code requires that the shipping company should implement a safety management system. There was strong belief that implementing a safety management system would result in a safety culture:

"Indeed, the proper implementation of the ISM Code should result in a safety culture."(ISF, 2010)

The purpose of the ISM Code is to provide an international standard for the safe management and operation of ships and for pollution prevention. The ISM Code requires that "every Company should develop, implement and maintain a Safety Management System (SMS)" (IMO, 1993). The ISM Code is considered to be the first maritime regulatory instrument that determines specified responsibilities to a company and its management with regard to safety (Anderson, 2003; see also Schröder-Hinrichs et al.2015).

The ships that were visited during this study sailed mostly in the Baltic Sea area, with the exception of one, which sailed in the Red Sea during the visit. The geographical characteristics of the Baltic Sea pose several challenges to maritime safety. For example, according to Finnish maritime pilots, the navigational conditions are difficult in the Finnish waters, because the routes are narrow, and there are a lot of turns and dangerous rocks (Lappalainen et al. 2014b). At the northern part of the Baltic Sea, the

navigational difficulties increase during the winter, because the sea can be ice-covered for several months (Valdez Banda et al. 2015). Because of the dense maritime traffic in the Baltic Sea, the area is recognized as one of the busiest vessel-operated areas in the world (Brunila & Storgård, 2012). Furthermore, the traffic is expected to increase in the future, especially due to the increase in maritime transport to and from the new Russian ports in Primorsk and Ust-Luga (Kujala et al. 2009; Brunila & Storgård, 2012). However, the shipping statistics of the Baltic Sea from the years 2009, 2010 and 2013 have indicated some decrease in shipping activities (HELCOM, 2014).

It is expected that the growth of maritime oil transportation, in particular, will increase the risk of maritime accidents in the Baltic Sea (see for example Kujala et al. 2009; Zhang et al. 2015). Based on the traffic data gathered by the Automatic Identification System (AIS) and incident reports, the spatial distribution of probabilistic accidents has been evaluated, and potentially dangerous places, or so called hot spots, have been identified in various parts of the Baltic Sea (Marcjan & Cucma, 2010; Montewka et al. 2010; Goerlandt & Kujala, 2011; Laine, 2015; Przywarty et al. 2015; Zhang et al. 2015). Special attention has been paid to the risk of an oil accident by analysing the spatial distribution of traffic flows, accidents and incidents and oil spreads models (Lehikoinen et al. 2015). The dominating accident types are grounding and collision (Kujala et al. 2009; HELCOM, 2014). According to HELCOM[2] statistics (HELCOM, 2014) collisions (collisions and contacts) were the main type of accidents in 2013, accounting for 38% of the accidents in total, while groundings accounted for 29% of the accidents (see Figure1).

[2] Baltic Marine Environment Protection Commission - Helsinki Commission is the governing body of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, known as the Helsinki Convention.

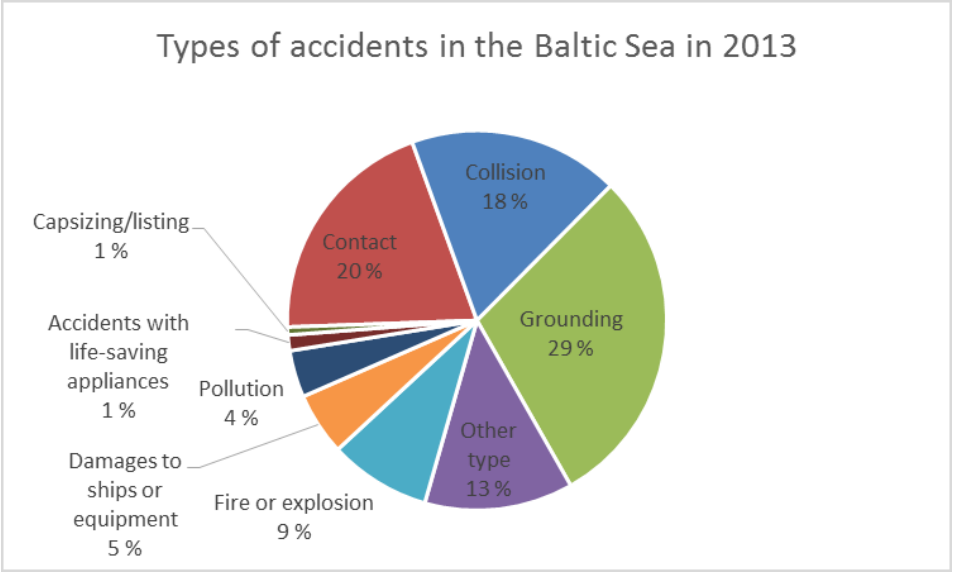

Figure 1. Types of accident in the Baltic Sea in 2013 (HELCOM, 2014)

Kujala, et al. (2009) found that most of the accidents that had occurred had happened in coastal areas or in ports (compare to Figure 2). The Spatial Distribution of Maritime Accidents 2004 – 2014 and near-misses 2013 - 2014 in the Southern Finland sea areas are presented in Figure 2 (Laine, 2015). Most of the near-misses had happened at the traffic separation areas where the traffic flows are congested (Laine, 2015).

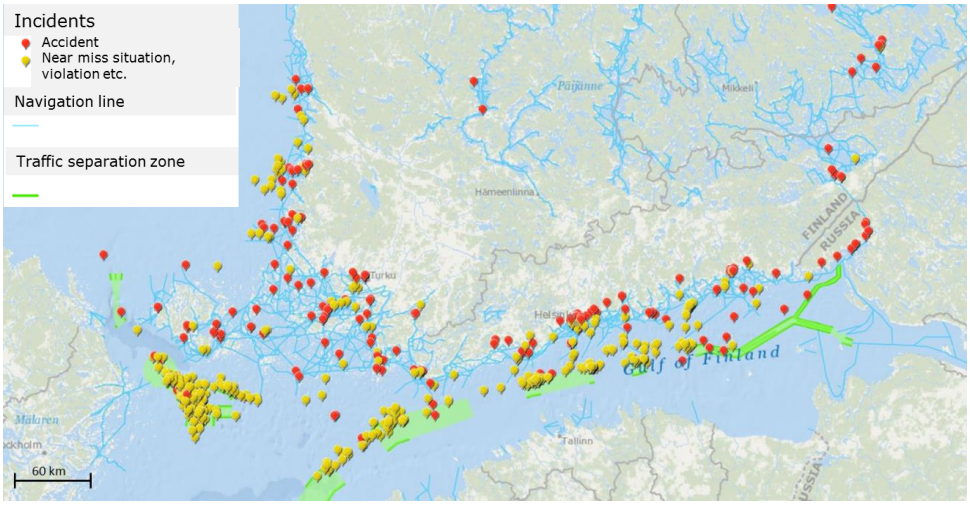

Figure 2. The spatial distribution of the accidents in the Southern Finland sea areas (Laine, 2015).

Several major maritime accidents have occurred while conducting this study. Insufficient compliance with the ISM Code has been connected to, for example, the accident of the Costa Concordia on 13 January 2012 and the accident of Ro-Ro ship Finnbirch on 1 November 2006 (Schröder-Hinrichs et al. 2012; Hansson & Nikolopoulos, 2012). According to Schröder-Hinrichs et al. (2012), it seems that a combination of human and organisational factors was present in the Costa Concordia accident. According to Hansson and Nikolopoulos (2012), the requirements of the ISM Code were violated by the ship owner of the Finnbirch. In addition, according to the Finnish Transport Safety Agency, deficiencies in the safety management or the ISM Code were linked to 31 accidents of Finnish ships during the period of 2002 – 2013 (Trafi, 2013).

1.2 Implementation of the ISM code

The objective of the implementation of the ISM Code was to reduce the amount of maritime accidents by creating a safety culture in the maritime industry (Goulielmos & Gatzoli, 2013). Some studies have indicated that the implementation of the ISM Code has resulted in a decrease of maritime accidents (IMO, 2005; Knapp & Franses, 2009; Tzannatos & Kokotos, 2009) However, according to Bhattacharya (2012), these studies

cannot be considered completely reliable. The efficacy of the ISM Code cannot be isolated from other contemporary changes that occurred after the implementation of the ISM Code. In addition, there is a lack of suitable accident data that would provide a reliable basis for an analysis (Mejia, 2001; Anderson, 2003; IMO, 2005; Bhattacharya 2012; Ek et al. 2014). Various authors have indicated that the ISM Code has not reached its full potential (see for example: Schröder-Hinrichs et al. 2015) and serious maritime accidents still occur in spite of the implementation of the ISM Code (Goulielmos & Gatzoli, 2013).

In addition, past studies conducted to determine the impact of the ISM Code on the maritime safety culture and the compliance with the ISM Code have not produced conclusive results and the research has been limited (Bhattacharya, 2009; Lützhöft et al. 2011; Xue et al. 2015). Some studies have indicated that the operations of the majority of shipping companies have improved due to the implementation of the ISM Code (Anderson, 2003; IMO, 2005; Paris MoU, 2008). There are still, however, shipping companies that have serious inadequacies in their safety management (Paris MoU 2008).

According to various studies, it seems that one major noncompliance with the ISM Code is related to incident reporting[3] (Anderson, 2003; Ek & Akselsson, 2005; Bhattacharya, 2009; Oltedal & McArthur, 2011; Lappalainen et al. 2011). The major reason for incomplete reporting is claimed to be the prevailing "blame culture"[4] in the maritime industry. Incident reporting has been considered the most significant indicator of an established safety culture (Anderson, 2003: Ek & Akselsson, 2005; Bhattacharya, 2009; Oltedal & McArthur, 2011; Lappalainen et al. 2011).

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[3] Incident reporting entails a systematic way of reporting incidents and near-miss occurrences at workplaces (Bhattacharya, 2009). The terminology concerning incidents is broad and there is a significant amount of variation in the terms found in various literatures (Jones et al. 1999; Bhattacharya 2009; Köhler, 2010). Altogether, there are approximately ten different terms that the IMO uses in its precepts and many of these terms overlap (Vepsäläinen & Lappalainen, 2010). In this study, we consider that incident reporting procedures cover reports and analyses of non-conformities, accidents and hazardous situations as required by section 9 of the ISM Code (IMO, 2010).

[4] A blame culture is evolving from a fear of social sanctions for reporting (Sanne, 2008; Storgård et al. 2012).

The efficacy of the ISM Code has not been investigated in Finland since this study, though according to the statistics of the Paris MoU (2008) Finnish ships have been successful in implementing the ISM Code. Based on the Port State Control statistics, there have been very few non-conformities on the Finnish ships (Paris MoU, 2008). Finland has been ranked as the best flag state by the Paris MoU in several years (Paris MoU, 2008).

Although the ISM Code has been in effect for twenty years since its establishment, the International Maritime Organisation still regards safety culture and safety management as highly topical issues (IMO, 2013). According to the IMO (2013), the effectiveness of the ISM Code should be kept under review.

> *"A further challenge is to identify and evaluate factors influencing safety culture and to turn them into practical and effective mechanisms for further developing a quality and safety culture throughout the maritime community." (IMO; 2013)*

As stated above, various studies have shown that the objectives of the ISM Code have not been reached completely. Thus I concluded that this study should be composed.

1.3 Statement of purpose, research questions and research approach

The purpose of this study is to explore the Finnish maritime personnel's conceptions of the maritime safety culture and its development. Secondly the purpose of this study is to evaluate the impact of the ISM Code on the prevailing safety culture. The research goal of this study is to analyse whether there has been progress in maritime safety culture in the opinion of the interviewed Finnish maritime personnel and investigate whether they have gained any benefit or encountered any deficiencies when utilising the safety management systems in day-to-day business and work. Finally, the thesis studies the opinions of the interviewees and whether they consider that the implementation of the ISM Code has changed the safety culture. The material consists of 94 interviews of people representing the Finnish maritime industry and observations on board.

The research questions are:

1. What is the current situation of maritime safety culture from the point of view of management commitment, employee participation and continuous improvement in the Finnish shipping industry?
2. How do the personnel of Finnish shipping companies see safety management? Do they consider it useful and beneficial and do they see any deficiencies in it?
3. Do the personnel of Finnish shipping companies feel like the ISM Code has changed the Safety Culture in the Finnish shipping companies?

The first research question is based on the findings of the accident investigations which revealed that the management were not committed and the crew members were not participative regarding safety and the industry had underdeveloped processes for the continuous improvement of safety (Department of Transport, 1987; Robinson, 1999; Kristiansen, 2005; Hänninen, 2007). It could be said that the safety culture was "poor". The research approach to the first research question is to evaluate whether there has, in the opinion of the interviewees, been progress with regard to these three safety culture fundamentals.

The second research question is based on the assumption that the maritime personnel have a negative attitude towards safety management systems. This assumption is based on the premise that safety management has previously been considered to be, for example, burdensome bureaucracy and the requirements of safety management have been considered to indicate distrust in the competence and professional skills of the maritime personnel (Anderson,2003; Bhattacharya, 2009). Furthermore:

> *"the demand for written procedures is perceived by many seafarers as counteracting the use of common sense, experience, and professional knowledge epitomized in the concept of seamanship."* (Knudsen, 2009)

The research approach to the second research question is to investigate whether the interviewees have gained any benefit, help or support from the safety management systems in their daily work. Furthermore, it is investigated what kind of disadvantages and deficiencies they have faced while utilising the safety management systems in day-to-day business and work.

The third research question is based on the belief of the "founders" of the ISM Code that the implementation of the ISM Code should result in a safety culture. The research

approach to the third research question is to survey the opinions of the interviewees if they consider that the implementation of the ISM Code has changed the safety culture. It has been suspected that the contribution of the ISM Code to the safety culture of the shipping industry has not been very strong. For example, Hänninen (2007) questioned the ISM Code as a remedy for the cultural defects that are related to the entire shipping industry.

This thesis is based on an extensive interview study which was carried out as a part of the METKU Research Project (Developing Maritime Safety Culture) during 2008 – 2010. One of the aims of the research project was to evaluate the impacts of the ISM Code on the maritime safety culture in Finland. The research partners were Aalto University, University of Turku, Kymenlaakso University of Applied Sciences and Turku University of Applied Sciences. The METKU project was funded by the European Union, Regional Council of Päijät-Häme, the City of Kotka and private companies. The aim of the METKU project was to compose a holistic view of the development of maritime safety in Finland during the past decade. (Heijari, & Tapaninen, 2010).

Based on the METKU research project, the author has previously published a literature report regarding the recent studies on maritime safety management and the impacts of the ISM Code on maritime safety culture (Lappalainen, 2008). The report concluded that the three fundamentals of safety culture are management commitment, personnel empowerment and continuous improvement. During the METKU project, Lappalainen and Salmi (2009) published an interview report, in which the results of the interviews were compared to those three fundamentals. The interview results were then further analysed in two journal articles. The aim of the first article was to take a closer look at incident reporting in the Finnish shipping industry, study the reasons for poor incident reporting and suggest improvements to increase reporting (Lappalainen et al. 2011). The purpose of the second article was to evaluate the ISM Code in the light of four criteria for an effective maritime safety policy: 1) incentive and innovation effects, 2) enforcement, 3) acceptability and 4) effectiveness and appropriateness (Lappalainen et al. 2014a). The criteria were established by Kuronen and Tapaninen (2009).

For this study, the results of the interviews are re-examined through applied qualitative content analysis and re-interpreted from a wider theoretical perspective.

1.4 Structure of the thesis

The structure of this thesis is as follows: Chapter two introduces the ISM Code and the reasons which led to its implementation. Chapter two begins with a short review of three fatal maritime accidents, in order to shed light on some of the problems within the maritime safety culture over two decades ago. Secondly, chapter two provides a brief description of the content and requirements of the ISM Code. The purpose of chapter three is to present the theory of safety culture and its relationship to organisational culture. After presenting the theory of safety culture, the previous studies regarding the ISM Code and maritime safety culture are reviewed. Based on the different perspectives for approaching safety culture, which are discussed in chapter three, the different methodological options are discussed and the chosen methodology is introduced in chapter four. Chapter five presents the key findings obtained from the interviews and observations. Chapter six analyses and interprets the findings in relation to the previous studies regarding the ISM Code and maritime safety culture. Chapter six is organised into the following sections based on the three research questions: the current situation of maritime safety culture, the maritime personnel's conceptions on safety management and safety culture, and the impact of the ISM Code on the maritime safety culture. Chapter seven provides the conclusions of this thesis. Chapter seven starts with the theoretical reflections concluded from the findings of the study and proceeds with the methodological reflections and assessment of the reliability and validity of the findings of the study. Finally, the chapter provides recommendations for practitioners and recommendations for further research.

2 ESTABLISHMENT OF THE ISM CODE

2.1 Poor safety culture

The accident of the ferry Herald of Free Enterprise occurred 6 March 1987 in Zeebrugge in Belgium. The accident caused the death of 193 persons. The direct cause of the capsizing of the ferry was that it had left the harbour with its bow doors open. As the ferry increased its speed, the bow wave grew and eventually reached the freeboard and water began to enter the car deck causing the ferry to capsize within a few minutes. The accident of Herald of Free Enterprise was caused by a combination of different factors. The accident is best described as a combination of various sorts of omissions and negligence at all levels of the shipping organisation prior to the accident. There were no clear and unambiguous instructions concerning safety actions, which lead to ambiguity regarding roles and responsibilities. This was primarily seen to be the fault of the senior management. The management of the company had been indifferent towards the safety enhancing propositions that had come from the ships. The Herald of Free Enterprise's sister ship Pride of Free Enterprise had sailed with its bow doors open in 1983. After the incident, the master of the ship had proposed to the shipping company that such system should be introduced to the ships that would identify and indicate to the bridge by a warning light that the bow doors might be open. The shipping company turned down the proposition as unnecessary. The master of Herald of Free Enterprise had made complaints a couple of times about the deficiencies in the ship's operations. According to the ship's master, the constant personnel changes amongst the ship's officers and changes in the ship's routes and time schedule made it difficult to operate the ship in a safe manner. The master was afraid that the fluent operation of the ship had been endangered, since the ship had not been properly maintained and the safety inspections and safety drills had not been properly executed as the ship's officers did not feel as if the ship was their own and they could not get a feel for the ship in such a limited time period. This deficiency was also disregarded by the shipping company. The company had been infected with gross negligence all the way up to the most senior management of the company. (Department of Transport, 1987).

The fire accident on the car ferry Scandinavian Star occurred during the night of 6 April 1990. The fire killed 158 people. The fire was supposedly deliberately set. However, during the accident investigation it became evident that the fire could have been restrained or even put out completely without any serious consequences if both the technical condition of the ship and the actions of the crew members had been appropriate. The accident investigation committee found several technical defects that had made it difficult to extinguish and restrain the fire and alarm and evacuate the passengers. Technical defects were discovered in the fire doors, sprinklers and alarms. The effective evacuation of the passengers was hindered by several factors. The emergency exits were quickly filled with smoke. The emergency exits had not been marked in Scandinavian languages. The routes to the emergency exits were hard to perceive in the labyrinthine ship, especially for those passengers who had not made themselves familiar with the ship beforehand. Some passengers had perished after straying into the wrong corridor. A successful evacuation would have required active guidance from the crew members (Robinson, 1999). The owner of the ship had only just been changed. The ship had undergone repairs and modifications, so that it would be suitable for route traffic between Norway and Denmark. Nevertheless, the repairs and modifications had not been completed before the ship started to operate on the new route. The crew had not been properly familiarized with the ship. In addition, the necessary safety training had not been arranged. The officers and crew members lacked the ship specific safety training and, because of that, the rescue operations and evacuation could not be organised (Robinson, 1999; Kristiansen, 2005). The final conclusion of the accident investigation committee was that neither the ship nor the crew were seaworthy. The shipping company had hastened the ship's deployment on the new route and thus taken a risk with safety. (Robinson, 1999). The accident investigation suggested that before taking a ship in use, the officers and crew members must receive safety and emergency situation education and training, which were later included in the requirements of the ISM Code. (Robinson, 1999; Kristiansen, 2005).

The car ferry Estonia capsized and sank during a storm on 28 September 1994 on the route from Tallinn to Stockholm. 852 people died in the accident. Only 137 people were rescued (JAIC, 1997). The direct cause of the accident was the damage caused to the

bow visor and its separation in the rough weather. As the visor separated from the rest of the ship it simultaneously pulled off the watertight ramp behind it, after which a great amount of water started to flood into the car deck. The effect was similar to the Herald of Free Enterprise case. Estonia lost its stability and began to list rapidly. The rapid tilting increased the flow rate of the water into the ship and the ship started to sink. There was very little time for the evacuation of the passengers. (JAIC, 1997).

Hänninen's (2007) analysis of the accident of Estonia brought to daylight cultural defects that were related to the entire shipping sector. Based on the conclusions of the accident investigation committee, neither the shipping company that owned Estonia or the crew of Estonia were guilty of any mistakes or negligence (JAIC, 1997). The passengers and crew of Estonia were first and foremost victims of the problems in the social structures and culture that plague the entire shipping industry (industrial level disease; Hänninen, 2007). The processes that led to the accident were intertwined into the established practices, roles and ascendancies between the different operators in maritime traffic, such as ship owners, shipbuilders and the organisations that carry out maritime legislation. According to Hänninen (2007), the sinking of Estonia was a systemic accident, with which Hänninen means the lack of risk management systems and the undeveloped state of the culture, in which different deviations and warning signals and corrective measures were not seen to be in need of any special attention.

The accident investigations of Herald of Free Enterprise, Scandinavian Star and Estonia showed that there were serious deficiencies in maritime safety during the late 1980s and early 1990s. The low safety level was seen to be caused by the lack of safety culture in the entire maritime industry sector. Safety culture deficiencies were found amongst the shipping company management as well as ship crews. The introduction of the ISM Code was expected to create a safety culture in maritime traffic.

Table 1 provides a summary of the major deficiencies revealed in the accident investigations. The management of the shipping companies were not committed, the crew members were not participative regarding safety and the measures for the

continuous improvement were missing (Department of Transport, 1987; Robinson, 1999; Kristiansen, 2005).

Table 1. Major deficiencies related to the maritime safety culture (Sources: Department of Transport, 1987; Robinson, 1999; Kristiansen, 2005; JAIC, 1997; Hänninen, 2007)

Problems within management commitment	**Problems within employee participation**	**Problems within continuous improvement**
• The shipping companies operated in a competitive manner and aimed to maximise their profits at the expense of safety • The management of the shipping company had not set any safety coals or aims and had not assigned anyone to be responsible for the safety issues • The shipping company was indifferent and sometimes even rejected the improvement suggestions that came from the ships	• The crew did not feel like the ship was their ”own” because of e.g. the high turnover rate of the officers • The ship’s officers and crew had a narrow view of their own roles and responsibilities • The officers and crew had limited skills and knowledge for emergencies (e.g. fire control and evacuation) • The master and the management of the shipping company had not considered the ship’s inadequate seaworthiness in any way • The seamen (ship’s officers and crew) were not active in making safety related initiatives or suggestions for improvement	• The information about the problems and dangerous situations improvement did not cumulate in the maritime sector. The maritime authorities did not receive enough information about problems and dangerous situations either • Neither the shipping companies nor the maritime sector have usually utilised procedures that made it possible to learn from the problems and dangerous situations so that they could be prevented in the future • The shipping companies did not have a procedure in use for the identification of risks and plans for emergency situations • The maritime sector accepted the dangerous situations and near miss – situations too easily. The risks were somewhat considered to be connected to the sector

2.2 The establishment of the ISM Code

Some time before the accident of Herald of Free Enterprise in 1986, the British Department of Transport had published guidelines on safety management (Department of Transport, 1987; Anderson, 1998). These recommendatory guidelines emphasized the meaning of good governance and the role of management in the safe operation of the ships. However, the shipping company that owned Herald of Free Enterprise had not followed these guidelines (Department of Transport, 1987). After the accident of Herald of Free Enterprise, national mandatory rules for safety management on passenger ships were rushed and the national rules came into force in 1988 (Goulielmos & Goulielmos, 2005).

In 1989, following an initiative by Great Britain in the IMO, a resolution that preceded the ISM Code was adopted (IMO, 1989; Goulielmos & Goulielmos, 2005 (IMO Guidelines on Management for the Safe Operation of Ships and for Pollution

Prevention)). Resolution A.647 (16) was merely a recommendation at this stage, but its contents were largely the same as the contents of the ISM Code (Vepsäläinen & Lappalainen, 2010). Eventually, the ISM Code was adopted as mandatory in a resolution in 1993. By this resolution, the ISM Code was incorporated into the international SOLAS[5] Convention, in which the Code generates the chapter IX. The ISM Code has been amended twice. The last time the ISM Code was amended was in December 2008, through the resolution of the IMO's Maritime Safety Committee (Vepsäläinen & Lappalainen, 2010).

Hastened by the accident of Estonia, the ISM Code was made compulsory on Ro-Ro passenger ships in the EU's internal traffic by the Council Regulation from the beginning of July 1996 (Vepsäläinen & Lappalainen, 2010). The ISM Code came into force worldwide gradually in 1998–2002. From July 1998, the ISM Code had to be observed by all passenger ships, high speed craft, tankers and bulk carriers. Other ships came into the scope of the ISM Code from the beginning of July 2002 (Anderson, 2003). The ISM Code was adopted in Finland through an amendment to the Finnish Maritime Code in 1995 (Finnish Maritime Code 674/1994, amendment 369/1995).

Currently, in the Finnish legislation, the provisions regarding the enforcement and application of the ISM Code are incorporated in the Act on Ships' Crews and the Safety Management of Ships (Act 1687/2009). According to the Act, the Finnish Transport Safety Agency monitors that the Finnish companies operating ships that are within the scope of application of the ISM Regulation follow the provisions of the ISM Regulation (Regulation (EC) No 336/2006 of the European Parliament and of the Council).

2.3 The objective and the requirements of the ISM Code

The main objective of the ISM Code was to create a maritime safety culture (Anderson, 2003; Oltedal, 2011). It was believed that a safety culture could reduce the amount of accidents, which caused considerable damages (e.g. Anderson, 2003). According to Anderson (2003), the IMO adopted the concept of safety culture as a fundamental basis

[5] The International Convention for the Safety of Life at Sea (SOLAS)

of the ISM Code, which is manifested, for example, in the IMO's guidelines for the implementation of the ISM Code by the administration:

> *"The application of the ISM Code should support and encourage the development of a safety culture in shipping. Success factors for the development of a safety culture are, inter alia, commitment, values and beliefs" (IMO, 2010)*

The benefits gained from the safety culture, which would be created based on the ISM Code and its application, were seen to result in safer ships and a cleaner marine environment (Anderson, 2003). According to Anderson (2003), one of the benefits of the ISM Code based safety culture would also be the shipping companies' competitive advantage.

The IMO defines the nature of safety culture as follows:

> *"An organisation with a "safety culture" is one that gives appropriate priority to safety and realises that safety has to be managed like other areas of the business." (IMO, 2014)*

According to IMO (1993), in order to succeed in safety management the commitment of the top management is essential:

> *"The cornerstone of good safety management is commitment from the top. In matters of safety and pollution prevention it is the commitment, competence, attitudes and motivation of individuals at all levels that determines the end result." (IMO, 1993)*

According to the IMO, safety culture can be achieved in maritime traffic by applying the following principles (IMO, 2014):

- *Understanding that accidents are preventable through following correct procedures and establishing best practice*
- *Constantly thinking of safety*
- *Seeking continuous improvement*

The specific requirements of the ISM Code were created based on the principles described above. The ISM Code is based on very loosely written general principles and objectives, so that it could easily be applied in different kinds of shipping companies and ships that sail in highly varying conditions (IMO, 1993). The ISM Code could be

considered to be the first maritime regulatory instrument that determines specified responsibilities to a company[6] and its management with regard to safety (Anderson, 2003).

It is the responsibility of the company to develop, apply and maintain a safety management system (SMS). It is the responsibility of the company, by employing the safety management system, to ensure the safe operation of the ship and to create a safe working environment, to protect from all identified risks and to ensure the continuous improvement of the safety management skills of the personnel working on board and onshore. That includes emergency preparedness in the fields of both safety and environmental protection (IMO, 1993). In the amendment that came into force in July 2010, further specifications were added to paragraph 1.2.2 concerning the identified risks. The shipping companies are now expected to perform systematic risk assessment, based on which appropriate safeguards to diminish or eliminate the risks must be devised. (IMO, 2008).

According to the ISM Code, the shipping companies must comply with regulations and other mandatory rules in their operations. The ISM Code also requires that the applicable codes, guidelines and standards recommended by the IMO, administration (in Finland that is the Finnish Transport Safety Agency), classification societies and maritime industry organisations are taken into account (EC, No 336/2006). Examples of the mandatory rules include the provisions of the SOLAS Convention. The quality and safety management standards also require compliance with laws and regulations. This requirement is expressed very clearly in the ISM Code. It is the responsibility of the shipping company to develop and maintain a safety management system that includes the following sections (IMO, 1993):

- *A shipping company's safety and environmental protection programme (safety and environmental protection policy)*

[6] "Company means the owner of the ship or any other organization or person such as the manager, or the bareboat charterer, who has assumed the responsibility for operation of the ship from the shipowner and who, on assuming such responsibility, has agreed to take over all duties and responsibility imposed by the Code." (IMO, 1993)

- *Instructions and procedures to ensure the safe operation of ships and environmental protection in compliance with relevant international and Flag State legislation (safety management system documentation)*
- *Defined levels of authority and lines of communication between shore and shipboard personnel and amongst them (roles and responsibilities)*
- *Procedures for reporting accidents and non-conformities with the provisions of this Code (deviations)*
- *Procedures to prepare for and respond to emergency situations*
- *Procedures for internal audits (ISM auditing) and management reviews (management reviews)*

2.4 The enforcement of the ISM Code

The responsibility to verify the implementation of the ISM Code belongs to the national maritime administration (IMO, 2010). In Finland, the national maritime administration is the Finnish Transport Safety Agency Trafi (former Finnish Maritime Administration). Trafi, or a recognized organisation (RO) acting on behalf of Trafi, performs the audits of the ISM Code based safety management systems (external ISM audits). The purpose of the audits is the following:

1. *The administration verifies in the audits that shipping companies and ships comply with the ISM Code*
2. *The purpose of the audits is to verify the effective functioning of the safety management system*
3. *In addition, the purpose of the audits is to support and encourage the shipping companies to achieve the objectives stated in paragraph 1.2.2 of the ISM Code. (IMO, 2010)*

Port State Control has a central role in controlling the implementation of the ISM Code. In Europe, the Port State Control system was agreed upon in the Paris Memorandum of Understanding on Port State Control (Paris MoU) in Paris in 1982. The parties that have signed the Paris MoU include, in addition to the maritime authorities of the coastal member states of the EU, also the maritime authorities of Russia, Canada, Norway, Iceland and Croatia. The aim of the Paris MoU was to create an international inspection and monitoring system, according to which the member states inspect ships in national ports in order to verify that they are in a condition approved by international standards and that international provisions are complied with. Ship inspections, rectifying deficiencies and ordering the detention of ships, if necessary, are the different actions

the port states can perform if the deficiencies endanger the ship, the crew or the safety of the marine environment. During the Port State Control, the inspector makes sure that the ship's safety management system is compliant with the requirements of the ISM Code. In addition to regular port state inspections, the members of the Paris MoU have organised concentrated inspection campaigns based on the ISM Code. The implementation of the ISM Code has been the topic of the concentrated inspection campaigns three times, in the years 1998, 2005 and 2007. (Paris MoU, 2008)

The aim of the inspections was to find out how well the requirements of the ISM Code are met on ships. During the first inspection in 1998, 1575 ships belonging within the scope of the ISM Code were inspected. In a little over 5 % of the ships, deficiencies of such seriousness were found that the ships were detained until the deficiencies were rectified on the ship (Paris MoU, 2008). In the concentrated inspection campaign organised in 2002, 3846 ships were inspected, during which time the share of detained ships was 4.2 %. In the autumn of 2007, the third concentrated inspection campaign was organized, the aim of which was to keep track of the progress of the application of the ISM Code. During the campaign of the year 2007, 5427 ships were inspected. According to the Paris MoU (2008), in approximately 20 % of the ships inspected during the campaign, some degree of deficiencies and defects in fulfilling the requirements of the ISM Code were found. ISM Code related deficiencies were found on 1031 ships. 176 ships were detained because of serious deficiencies relating to the ISM Code. According to the Paris MoU (2008), the safety management systems on the detained ships were poor. The effect of the ISM Code was in those cases found to be a dead letter, despite the fact that in many cases the documentation of the safety management system had swollen into a paper mountain.

Table 2 shows the amount of ships that were detained due to serious deviations from the ISM Code, and their relative share from all of the inspected ships in the concentrated inspection campaigns of the years 1998, 2002 and 2007 (Paris MoU, 2008).

Table 2. Ships detained due to serious deviations from the ISM Code during the concentrated inspection campaigns.

Year	Number of inspected ships	Detained ships	Percentage of detained ships
1998	1575	81	5.14 %
2002	3846	169	4.39 %
2007	5427	176	3.24 %

The share of the ships detained based on deviations related to the ISM Code has declined slightly with time. The safety management system based on the ISM code is slowly and gradually starting to work on ships. According to the Paris MoU (2008), the ships' crews largely understand the requirements of safety management and apply them in practice. Nevertheless, in all three inspections campaigns ships were found in which safety management was not functional in practice, and therefore the crew and maritime environment were endangered. According to the Paris MoU, the owners of these ships were not committed to safety. In these shipping companies the safety aspects did not govern the safety management – instead, competition and commercial pressure made the companies compromise the maintenance of the ships, neglect the emergency situation training of the crews and become indifferent to learning from mistakes and dangerous occurrences. In the inspections, big differences were found based on the different flag states and the classification society that had granted the ISM certificate, in which case the existence of the ISM certificate did not guarantee the actual implementation of safety management on the ship. Despite the obtaining of the ISM certificate, the ship had not fulfilled the requirements of the ISM Code in practice and thus there was still a lot to improve in the application of the ISM Code. The Paris MoU recommended that the maritime authorities of its member states constantly pay attention to safety management in their future port state inspections.

Finnish ships have done very well in international comparison. In the concentrated inspection campaign of the year 2007, no Finnish ships had to be detained. In addition, no ISM Code related deviations were found on Finnish ships during the inspection campaign. During the campaign, 37 Finnish ships were inspected in different port states of the Paris MoU. The Finns have done very well in regular port state control inspections also. The Paris MoU has ranked Finland as the safest flag state in 2005 and 2007 (Paris MoU, 2008). During the recent years, Finland has not been as successful in

the ranking. In the year 2014, Finland's rank was 16. However, Finland's total performance has remained at a high level: for example, the number of deficiencies has decreased, but the other member states of the Paris MoU have progressed even more (Trafi, 2015)

3 CONCEPT OF SAFETY CULTURE

3.1 Geographical studies on ships and organisation

This thesis is a contribution to the geographical studies of organisation (Del Casino et al. 2000; Audia, 2015; Müller, 2015) and the geographical studies of ships (see, for example, Hasty & Peters 2012; Anim-Addo et al. 2014). According to Audia (2015), organisational geography or geography of organisations studies the spatial features of organisational activities. Müller (2015) defines the geography of organisation as an interdisciplinary study of the spatial aspects of organisations and processes of organizing. Correspondingly, the geography of mobilities or geography of transport studies movements that take place over space (Rodrigue et al. 2009; Cresswell & Merriman, 2011; Anim-Addo et al. 2014). Geographies of ships, as a variety of geographical studies of mobilities, studies spaces, places, times and scales of the ships and the journeys they made possible (Anim-Addo et al. 2014).

According to Müller (2015), geography of organisations is interested in how organisations shape geography and, vice versa, how geography shapes organisations. Similarly, geography of ships is interested in how ships have affected geography and how geography has affected ships and shipping (Hasty & Peters, 2012). Shipping is a particular industry where particular organisational and geographical features are intertwined. Following Hasty and Peters (2012), the characteristics of organisation in shipping companies and on board ships are strongly influenced by geography i.e. distance, mobility, nationality etc. According to Yliskylä-Peuralahti and Gritsenko (2014), *"there are multiple geographies in place where shipping is practised".* The shipping companies can be located in one country, their ships can be registered in another country, the crew members can represent multiple nationalities and the ships can operate to and from multiple locations all over the world (Berg et al. 2013; Bhattacharya & Tang, 2013; Walters & Bailey, 2013; Bhattacharya, Y. 2015; Yliskylä-Peuralahti & Gritsenko, 2014).

The safety regulations concerning shipping act at several geographical levels (Kuronen & Tapaninen, 2009; van Leeuwen, 2015). At the international level, the most important

actor is the International Maritime Organisation (IMO). The major regulatory instrument regarding maritime safety is the International Convention for the Safety of Life at Sea (SOLAS), which includes, for example, the requirements of the ISM Code. According to Stopford (cited in Kuronen & Tapaninen, 2009), worldwide regulations on maritime safety are needed in order to avoid a situation where each coastal state would have its own rules on issues like ship structure, manning etc. Maritime safety is also regulated at the regional level (Kuronen & Tapaninen, 2009; van Leeuwen, 2015). For example, compliance with the ISM Code was made compulsory on Ro-Ro passenger ships in the EU's internal traffic by the Council Regulation from the beginning of July 1996 (Vepsäläinen & Lappalainen, 2010). At the regional level, the most important regulation concerns the Port State Controls (see for example, Perepelkin et al. 2010; Fan et al. 2014; Rodríguez & Piniella, 2014; Cariou & Wolff, 2015; van Leeuwen, 2015). The international maritime safety regulation is implemented at the national level i.e. by the flag states and the port states (Kuronen & Tapaninen, 2009; Yliskylä-Peuralahti & Gritsenko, 2014). For example, pilotage is governed by national regulations (Kuronen & Tapaninen, 2009). Kunnaala and Lappalainen compared how pilotage organisations assess and measure quality, efficiency and safety and the prevailing safety practises concerning pilotage in Finland, Australia, Canada, and Western and Northern Europe (Kunnaala et al. 2013; Lappalainen et al. 2014b). These studies indicated that there are significant differences in pilotage organisations and their practices between countries.

Several studies have criticised the current multi-level maritime safety regime as being ineffective in ensuring that every ship complies with the international maritime regulations (Roe, 2009; Kuronen & Tapaninen, 2009; Fan et al. 2014; Rodríguez & Piniella, 2014; Cariou & Wolff, 2015). The current safety regime allows so called sub-standard shipping because some flag states (so called Flag of Conveniences; FOC) permit foreign ships to be registered into their open registers which are more permissive regarding, for example, safety regulation and manning requirements (Bhattacharya & Tang, 2013; Fan et al. 2014; Rodríguez & Piniella, 2014; Cariou & Wolff, 2015). In addition, Bhattacharya and Tang (2013) claimed that the geographical distance between the ships and the regulators complicates the surveillance of the safety standards.

According to Fan et al. (2014), the Port State Control Regime was established to fill the gaps in the enforcement of the maritime safety regime at the international and national levels (see also van Leeuwen, 2015). It is indicated that the Port State Control inspections have been effective in improving maritime safety by reducing deficiencies related to international safety standards (Cariou et al. 2008) and have hence reduced the probability of casualties (Knapp & Franses, 2007; Heij et al. 2011). According to Knapp et al. (2011), the Port State Control inspections have led to cost savings among the shipping industry. Based on the statistics collected within the Port State Control inspections, some studies have compared the performance of different flag states in terms of compliance with maritime safety standards (Corres & Pallis, 2008; Paris MoU, 2008; Perepelkin et al. 2010). Finnish ships have been very successful in these comparisons (Corres & Pallis, 2008; Paris MoU, 2008).

One important reason for registering the ships in a flag of convenience is that the FOCs allow multinational crews, thus allowing the shipping companies to reduce their manning costs (Theotokas & Progoulaki, 2007; Bhattacharya & Tang, 2013; Fan et al. 2014) Several studies have shown that the nationality of the crew members plays a significant role in relation to safety (Horck, 2010; Baylon & Santos, 2011, Grøn & Knudsen, 2011, Lu et al. 2012; Berg et al. 2013) and it has been claimed that multicultural crews are a risk for maritime safety (Mårtensson, 2006; Theotokas & Progoulaki, 2007). Communication problems based on, for example poor language skills are identified as one important risk factor (Sampson & Zhao, 2003; Pyne & Koester, 2005; Hetherington et al. 2006; Håvold, 2007; Popescu et al. 2010).

Geography characterises the organisational structure of shipping. According to Goulielmos and Gatzoli (2012), shipping should be considered as "Management from a Distance", which means that that the top management of the shipping company and its mobile "factories" and their crews are in different places (see also Bhattacharya & Tang, 2013). There is always a more or less long distance between the ship and the office. That distance poses a special challenge to safety management, which has been attempted to be taken into account in the ISM Code (IMO, 1993) by stating that the master should have an overriding authority and responsibility regarding safety on board.

Despite this, several problems caused by the distance have been found. The "fact" is that the culture of a company is different than the culture of its ships (Grabowski et al. 2007; Goulielmos & Gatzoli, 2012). According to Goulielmos and Gatzoli (2012) and Bhattacharya and Tang (2013), the geographical distance between the ship owner and the ships forms a concrete barrier in developing a strong safety culture based on the shipping company's accepted goals and values. According to Goulielmos and Gatzoli (2012), the culture on the ship is defined by the master. Goulielmos and Gatzoli (2012) found that Greek masters were autocratic and they kept strict hierarchical order on-board the ships, which could be a risk in a hazardous situation. On the other hand, Xue et al. (2015) revealed that that, in the Chinese ships they studied, the decision-making was centralised to the shore management and the shipmaster's decision-making power was rather limited, which can compromise the requirements of the ISM Code. The shipmasters are obliged to work under strong commercial pressure (Goulielmos & Gatzoli, 2012) caused by the shore management e.g. ordering them to keep the sailing schedules (Xue at al. 2015).

Yogendra Bhattacharya (2015) found that the distance between the shipping owner and the ship's personnel, as well as the fragmented organisational structure, cause the employee engagement levels among ship crews to be lower than in shore based industries. According to him (Bhattacharya, 2015), the personnel on-board have minimal to no contact with the ship owners because of the geographical and organisational distance, in which the owner, ships, ship operator and the ships' personnel may each come from different countries. Bhattacharya (2015) found this problematic, because it is indicated that the employee engagement correlates with safety level.

In summary, while studying maritime safety culture, it is almost impossible to not take into account the geographical features that shape international shipping. Most of the previous studies regarding the assessment of maritime safety culture and/or the investigation of the impacts of the ISM Code have focused on a single country (see in detail Section 3.4). No comprehensive comparison between different countries and different nationalities was found. However, this study concentrates on the Finnish

shipping business, in which the maritime safety culture and the efficacy of the ISM Code have not been studied at all. The focus is on Finnish owned ships and their Finnish personnel.

3.2 The origin of safety culture and safety management

The concept of culture in the organisational theory is derived from anthropology (Smircich, 1983) and from sociology (Antonsen, 2012). According to Smircich (1983), there is no broad consensus on the definition of the concept of culture (see also Antonsen, 2012). Antonsen (2012) sees "culture as the frames of reference through which information, symbols and behaviour are interpreted and the conventions for behaviour, interaction and communication are generated." Respectively, the organisational culture can be defined as a background factor influencing the company's operations, an organisational variable or a metaphor for conceptualizing the organisation (Smircich, 1983). Most definitions consider safety culture as a part of organisational culture, with a focus on safety (Glendon & Stanton, 2000; Cooper, 2000; Wiegmann et al. 2002; Richter & Koch, 2004; Reiman et al. 2008: Guldenmund, 2014). More thorough elaboration about the concept of culture and the concept of organisational culture can be found from Smircich (1982) and Antonsen (2012).

The origin of the concept of safety culture can be dated to the second half of the 1980s after several fatal accidents, for example the Chernobyl nuclear power station accident in 1986, the falling of the oil production platform Piper Alpha in 1988 and the disaster of the space shuttle Challenger in January of 1986 (Reiman & Oedewald, 2007; Guldenmund, 2010; Strauch, 2015; Warszawska & Kraslawski, 2015). In the field of shipping industry, safety culture emerged after the capsizing of Herald of Free Enterprise in March of 1987 (Goulielmos, 2001; Anderson, 2003; Gill & Wahner, 2012). A breakdown in organisation safety culture was seen as the main contributor to these accidents (Gill & Wahner, 2012; Strauch, 2015; Warszawska & Kraslawski, 2015). As a response, the authorities soon began to demand proper safety culture, first in the field of nuclear power industry and after that in other safety critical fields (Reiman & Oedewald, 2007).

The organisational culture theory emerged in the management literature, particularly in the USA, in the beginning of the 1980s (Barley & Kunda, 1992; Schein, 1992; Shafritz & Ott, 2002). Difficulties faced by the traditional US industry sector led to changes in the labour market (Barley & Kunda, 1992; Schein, 1992). As a response to these difficulties, the organisational culture theorists required that the personnel should be committed strongly to the shared values of a company (Peters & Waterman, 1982; Barley & Kunda, 1992; Schein, 1992; Guldenmund, 2010) in which their own wellbeing and the success of the employing company are not distinguished (Barley & Kunda, 1992). This kind of commitment can be achieved by creating "a strong organisational culture" (Barley & Kunda, 1992).

Schein (1992) describes organisational culture theory as a multidisciplinary approach, which has been influenced by anthropology, sociology and psychology (see also Smircich, 1983; Schein, 1992; Guldenmund, 2010). An organisation has to be seen as socially constructed systems of meaning that are based on the cultural features of the organisations (Schein, 1992). The organisational culture theory assumes that an organisation has its own underlying structure, which is invisible and unconscious, yet influential, guiding the thinking, choices, decision making and actions of people (McAuley et al. 2007; Harisalo, 2008; Guldenmund, 2010). Despite the different and variable approaches to the concept of organisational culture, the most important thing about organisational theory is that organisational culture theory focuses on the non-rational qualities occurring in the operations of an organisation and on the subjective, interpretive aspects of organisational behaviour (Smircich, 1983). According to Smircich (1983), similarly as in the case of culture, there is no broad consensus on the definition of the concept of organisational culture, and therefore it is not a surprise in the field of organisational theory, culture has also been defined in many different ways (see also Haukelid, 2008; Guldenmund, 2010). Moreover, like organisational culture, safety culture has numerous different definitions in literature (Reason, 1997; Wiegmann et al. 2002; Haukelid, 2008). Richter and Koch (2004) define safety culture as commonly learned meanings, experiences and interpretations of work and safety, which guide people's perceptions about risks, accidents and accident prevention. Reiman et al. (2008), on the other hand, define safety culture as organisational culture in which safety

related values and basic assumptions highlight safety and commitment. Reiman et al. (2008) add that safety culture should not be examined separately from organisational culture, because such reviews might be limited to factors that are already known and are obviously linked to safety.

The structure of the organisational culture is usually described as a system with different levels, from the more superficial aspects to the deeper, most commonly divided into three levels (Schein, 1992; Glendon & Stanton, 2000; Reiman & Oedewald, 2002; Harisalo, 2008; McAuley et al. 2007; Guldenmund, 2010). Guldenmund (2010) proposes that the same three level framework should be applied to the conceptualisation of safety culture (see Table 3).

Table 3. Levels of Safety Culture (Applied from Guldenmund, 2010)

Levels of culture	**Visibility**	**Examples**
Surface level: artefacts or creations	Visible but not easy to interpret	Safety slogans (see Figure3) Results of the ISM Audits Minutes of safety meetings
Intermediate level: visible and consciously expressed values level	Relatively explicit and conscious	Company's safety and environmental policy required by the ISM Code
Deepest level: basic assumptions or core values	Mainly implicit	The beliefs on the concept of seamanship (see for example Knudsen, 2009)

Figure3. Safety first and no smoking texts painted on the superstructure of a tanker ship (2009)

The surface level of organisational culture includes, among other things, the visible behaviour and established behavioural norms. By observing the artefacts and creations, for example, visible behaviour can be described, but not the reasons behind the behaviour. At the intermediate level are the attitudes and perceptions that cannot be directly observed, but can be inferred from visible behaviour or can be accessed, for example, through interviews and questioning. At the deepest level are the core values or the basic assumptions that are difficult to recognize and assess. The choice of research method depends on the level to be studied. (Schein, 1992; Glendon & Stanton, 2000; Reiman & Oedewald, 2002; Guldenmund, 2010).

Organisational culture theory included a promise that if the prevailing cultural features of the organisation are taken into consideration, the productivity and financial performance of the company can be enhanced (Barley & Kunda, 1992). This promise has gone the furthest in the movement of total quality management (TQM) and Deming is considered to be the founding father of that movement (Hackman & Wageman, 1995; Shafritz & Ott, 2002; see also Guldenmund, 2010). According to Deming (1986), strong commitment to the company's culture supports the quality objectives and high productivity directly. Deming (1986) stated that the most important requirements for the company management are impregnable commitment to quality management and

willingness to seek continuous improvement, learning and the development of operations.

Total quality management can be seen as an ideology that spread during the decades, starting from the mid-80s, from industrial companies to health care, public administration, organisations and the education sector (Hackman & Wageman, 1995). The principles of total quality management are implemented in several quality standards. The most common international standards are:

- ISO 9000 quality management standard
- ISO 14000 environmental management standard
- OHSAS 18001 occupational health and safety management standard
- ISO 28000 standard developed for dealing with security assurance in the supply chain in the transport and logistics sector
- ISO 31000 standard on risk management
- ISM Code, a compulsory maritime safety management standard.

According to Krause et al. (1999), the principles of total quality management that Deming represented were adopted in safety management as such. Guldenmund (2010) noticed that the TQM ideology in the arena of organisational safety culture has somewhat religious features considering the strong and uncritical belief that by adopting a particular safety related frame of reference and performing particular activities a total safety culture (TSC) can be achieved (see Geller, 1994). By summarizing different studies about safety management systems and safety culture, Wiegmann et al. (2002) have identified the following features that are common in a "good" safety culture (see also Reason, 1997; Collins & Gadd, 2002; Guldenmund, 2010):

- Organisational commitment,
- Management involvement,
- Employee empowerment,
- Reporting systems and
- Rewarding systems.

Organisational commitment means the commitment of the upper-level management to safety (Wiegmann et al. 2002). The commitment of the upper-level management is recognized as playing a critical role in safety management as well (Wiegmann et al.

2002; Petersen, 1996; Roughton & Mercurio, 2002). A committed upper-level management identifies safety as a core value or a guiding principle of the organisation (Wiegmann et al. 2002). In practice, the upper-level management demonstrates its commitment by showing visible positive attitude towards safety, by actively promoting safety and by ensuring that the safety activities of the company have sufficient financial and other resources (Wiegmann et al. 2002).

By management involvement, Wiegmann et al. (2002) mean the role of the management in governing day to day operations. The management should encourage and lead with their own example and by communicating openly with the personnel about safety related issues. The management should be present and actively involved in, for example, safety trainings and seminars (Collins & Gadd, 2002). The management should be fully aware of the risks involved in everyday operations and be able to stay in touch with safety related issues (Wiegmann et al. 2002; Collins & Gadd, 2002).

Like in total quality management, one characteristic of a good safety culture is considered to be the personnel having the chance to participate and the delegation of responsibility regarding safety-related issues by the upper-level management. An organisation with good safety culture has to ensure that its personnel have a clear understanding about their role in promoting and enhancing safety. Employee empowerment to work actively in the field of safety improves the personnel's attitudes and motivation towards safety (Wiegmann et al. 2002). The personnel must have an opportunity to participate in safety decisions and have the leverage to make safety related initiatives. The personnel should also be somehow rewarded for achieving safety goals (Wiegmann et al. 2002).

A rewarding system establishes how safe and unsafe behaviour is seen, how the behaviour is evaluated and what kind of rewards and penalties result from the evaluations (Wiegmann et al. 2002; Reason, 1997). Safe behaviour can be reinforced with a fair and equal reward system (Wiegmann et al. 2002; see also Eiff, 1999). Safety management should promote safe behaviour and correspondingly discourage or punish unsafe behaviour (Wiegmann et al. 2002).

One of the keystones of safety culture is the reporting system, which provides the foundation for the establishment of the continuous improvement process. With the reporting system, it is possible to identify the weaknesses and vulnerabilities of the organisations' safety before an accident occurs (Wiegmann et al. 2002). According to Eiff (1999), an organisation must have a functioning 'reporting culture'. A reporting culture is considered to indicate the organisation's willingness and ability to proactively learn and adapt its operations based on incidents and near miss situations (Eiff, 1999). The personnel must be supported and encouraged, so that they feel comfortable reporting on incidents and near misses (Eiff, 1999). The necessary reactive measures and feedback based on the reports must be provided without delays (Wiegmann et al. 2002).

The list of features of good safety culture by Wiegmann et al. (2002) does not explicitly include continuous improvement. Nevertheless, the reporting and rewarding systems can be seen as practical tools of continuous improvement. According to the classification of Wiegmann et al. (2002), management commitment has been divided into two different concepts, in contrast with the principles of total quality management. Management commitment in the model of Wiegmann et al. (2002) consists of both organisational commitment and management involvement.

The relationships between safety culture and safety management systems could be defined as follows: the features or fundamentals of good safety culture (management commitment, personnel empowerment and continuous improvement) are embodied in a safety management system (Guldenmund, 2010). Following Guldenmund (2010), if safety culture is considered as a religion (Guldenmund, 2010) the safety management system provides the guidelines for practicing that religion. Arguably, the features of good safety culture are implemented in the ISM Code as such, thus it can be stated that the religious stance towards safety culture is quite obvious in the discourse on the ISM Code (see chapter 3.3 Objective and requirements of the ISM Code).

3.3 Major traditions in approaching organisational culture

The theories of organisational culture can be classified in several ways. Several authors have classified the theories into two main categories: functionalist and interpretive theories (Smircich, 1983; Glendon & Stanton, 2000; Harisalo, 2008). According to some authors, there are three major traditions (McAuley et al. 2007) or paradigms (Guldenmund, 2014) when it comes to approaching the concept of organisation culture: the functionalist, the interpretive and a third one, the postmodernist approach, called constructivism by Guldenmund (Schultz & Hatch, 1996; McAuley et al. 2007; Demers 2007; Guldenmund, 2014).

The functional tradition is based on the belief that organisation culture is built into the organisation as a subsystem, like organisational structure, and its purpose is to advance the development of organizational goals and values as defined by the management of the organisation (McAuley et al. 2007; Guldenmund, 2010). The following common conceptions can be linked to functional safety culture theory:

- There is an ideal state that the organisation should aspire to (Reiman et al. 2008)
- The management has a great influence on enhancing safety (Richter & Koch, 2004)
- Top-down control (Richter & Koch, 2004)
- The culture can be changed and manipulated (Richter & Koch, 2004; Reiman et al. 2008)
- Safety culture enhances the organisation's operating ability (Reiman et al. 2008)
- Adopting safety culture decreases human errors (Rothblum et al. 2002)

The functional theory implies that the culture exists on a continuum and that organisations can have either a good or a poor safety culture (Wiegmann et al. 2002; see also Pidgeon, 1998; Guldenmund, 2010; Lützhöft et al. 2011)

The functional theory is based on the idea that organisations can create and develop their own kind of culture that is rare and hard to copy and that works as the basis for their knowledge and enables their success (Smircich, 1983; Glendon & Stanton, 2000; Harisalo, 2008). According to Smircich, an organisation "has" a culture (Smircich,

1983), which enables the organisation's success by channelling its members' thinking, behaviour and choices towards the desired direction (Schein, 1992; Harisalo, 2008; McAuley et al. 2007; Guldenmund, 2010). Organisational culture is a result of management and the maintenance and development of the organisational culture requires managing (Schein, 1992; Harisalo, 2008). If the management neglects its duties, the culture no longer supports the organisation's operation and may thus, for example, endanger safety. People cease to strive to perform the necessary tasks and ignore the endeavours of the management. The initially strong culture becomes weak and the success of the organisation is compromised.

Interpretive approaches assume that organisational culture is a system of shared symbols and meanings (Smircich, 1983; Allaire & Fisirotu, 1984; McAuley et al. 2007) given to organizational phenomena by all members of an organisation (Glendon & Stanton, 2000; Reiman et al. 2007). Organisational culture serves as a media for all members of an organisation to interpret their collective identity, beliefs and behaviours (Glendon & Stanton, 2000).

The most prominent difference between the functional and interpretive theories is how much the management is considered to be able to control, change or manipulate the organisational culture. In the interpretive approach, culture is a factor in the organisation that people have to adapt to, and that is difficult, if not impossible to change. In that case, the management has limited power to mend and improve unwanted cultural factors or create a new culture to replace the old one (Harisalo, 2008). When the organisation *"is"* a culture (Smircich, 1983), the people conform and adapt to the prevailing culture without being able to change or improve the culture to their liking (see also Harisalo, 2008). The management efforts to promote their objectives are prevented by the inflexible culture (Smircich, 1983; Harisalo, 2008). The culture develops slowly over time, even undetected. The people in the organisation have only a minor influence on the culture, which develops independently and evolutionarily (Harisalo, 2008).

Reiman et al. (2008) state that both the functional and interpretive approaches include a presumption that organisational culture can be influenced at least to some extent, but

then again the organisation might be bound to its culture. Interpretive theories also accept the notion that the culture can be changed and it can happen either internally, through management, or come from outside the culture, i.e. through requirements imposed by authorities (such as the obligatory nature of the ISM Code) (Reiman et al. 2008). Similarly, the functional theories include a notion that the culture affects the management more than the management affects the culture (Reiman et al. 2008). Schein (2001) also supports this viewpoint with his example, in which the recruitment of a new manager can fail if he is unable to adopt the basic assumptions of the old organisation or unable to change them (Schein, 2001).

The third approach is called postmodernism (Schultz & Hatch, 1996; McAuley et al. 2007; Demers, 2007) or social constructivism (Guldenmund, 2014). The postmodern approaches challenge both functionalist and interpretive approaches in several ways (Schultz & Hatch, 1996; McAuley et al. 2007). For a start, according to McAuley et al. 2007, both approaches look for unity and the homogenisation of the people in the organisation in order to create an efficient and effective organisation. According to Alvesson (2002), this viewpoint is based on the causal idea that creating the right organisational culture can be expected to induce considerable and important results and effects in the organisation, such as, loyalty, reliability, enhanced productivity and enhanced safety. This viewpoint of the ideal of a uniform culture is criticised also because it is narrowly based on the viewpoints and comprehension of the elite or management (Alvesson, 2002 Haukelid, 2008; Martin, 2007; see also Guldenmund, 2014). It is assumed that the organisation and its employees have corresponding, even rational goals as long as they are understood correctly at all levels of the organisation. The perspectives of less powerful people are ignored (McAuley et al. 2007; Martin, 2007). Alvesson (2002) calls the approach that aims for unified organisational culture "*integration*". According to McAuley et al. (2007), this is a very top-down management view of cultural formation that underplays the diversity of cultural forms in an organisation.

According to Knights (2002), the postmodern approach in organisation theory is based on the ideas of Michel Foucault (see also Schultz & Hatch, 1998; McAuley et al. 2007).

The postmodernists assume that an organisational culture is more often rather differentiated and fragmented than in harmony and based on sharing common values and norms (Haukelid, 2008; Schultz & Hatch. 1998; Knights, 2002; Guldenmund, 2014). It is also important to bear in mind the power and politics related conflicts in the organisation (Alvesson, 2002; Haukelid, 2008; Antonsen, 2009a). Conflicts between different groups and subcultures can emerge based on the different goals and needs for working in the organisation and being a part of the organisation - in that case, the organisational culture is differentiated. Alvesson (2002) introduces, alongside with integrated culture and differentiated culture, also the concept of culture ambiguity. According to Alvesson (2002), cultural manifestations are rarely in a neat order, the order of the values varies and the cultural ideas are unsystematic and inconsistent. In cultural ambiguity, the manifestations of culture have different meanings. Cultural symbols are interpreted in ways that can be conflicting, incommensurable and irreconcilable (Richter & Koch, 2002). For example productivity can be understood and defined differently in different parts of the organisation and it can have a different time span depending on the viewpoint; short term – long term (Alvesson, 2002). The organisational culture is also in a constant state of change (Haukelid, 2008; Reiman & Oedewald, 2002). New meanings are created for cultural manifestations and the people continuously give these meanings new and different interpretations depending on the current time, place and situation (Richter & Koch, 2002). The variation, fragmentation and inconsistencies in interpreting and understanding cultural manifestations have to be taken into account when studying the organisational culture (Alvesson, 2002).

Finally, postmodern perspectives reject the possibility of a "grand theory" of organisational culture (McAuley et al. 2007). According to Jeffcutt (1993; quoted in McAuley et al. 2007), both functionalist and interpretive approaches to culture "share a commitment to establishing a definitive understanding or last word on the nature of organisational reality through a process of closure that privileges particular readings and voices while suppressing and denying alternative articulations". Instead of attempting to develop an universal law of organisational culture the postmodern approach attempts to understand the subjective nature of the world, meaning that all claims to knowledge are seen as contingent and temporary (McAuley et al. 2007). Particularly, the postmodern

approach is focusing on lower level workers and seeks to give voice to those previously silenced (McAuley et al. 2007; Martin, 2007).

In safety culture conflicts, ambiguity and disintegration also occur in the values and basic assumptions that guide people's actions regarding risks, accidents and prevention (Richter & Koch, 2004; see also Pidgeon, 1998 and Pidgeon & O´Leary, 2000). According to Richter and Koch (2004), safety culture should be seen as a multiple configuration of integration, differentiation and ambiguity cultures, in which macro-cultures, local cultures and subcultures overlap and interact (Richter & Koch, 2004; see also Alvesson, 2002 and Guldenmund, 2014).

According to Richter and Koch (2004), the functional approach has been predominant when defining safety culture (see also Guldenmund, 2010). This can be seen especially in the authorities' requirements, which stress the functional approach to safety culture (Richter & Koch, 2004). Many scholars have also defined safety culture through the functional approach, basing their studies mainly on the assumption of a uniform culture (Richter & Koch, 2004). Studies utilising interpretive approaches are very rare in the area of safety culture and the studies addressing differentiation, fragmentation and power issues are almost absent (Richter & Koch, 2004; Martin, 2007; Antonsen, 2009a; Guldenmund, 2010). According to Antonsen (2009a), safety culture studies have relied on a harmony model of organisational life. Antonsen (2009a) argues that issues of culture and power are so intertwined that safety culture research should incorporate perspectives of power and conflict.

3.4 Impacts of the ISM Code on maritime safety culture

The impacts of the ISM Code have aroused the interest of researchers from their early days (Hahne et al. 2000; Mejia, 2001; Pun et al. 2003; see also Anderson, 2003; IMO, 2005). In the early days of the ISM Code, resistance to change regarding safety management was encountered amongst the shipping companies and the ships' crews. In addition, lack of resources and time in implementation of safety system management and lack of education were found (Hahne et al. 2000; Pun et al. 2003; Anderson, 2003).

In the early stage, the systems were made too burdensome and complex, in which case the adoption of the system was difficult and they were received as bureaucratic paper work (Anderson, 2003; IMO, 2005). Hahne et al. (2000) explained that the early resistance among the seafarers stemmed from repulsion to the obligatory establishment of safety culture. Anderson (2003) considers it understandable that the personnel saw this kind of a safety management system as objectionable.

In 2005, an expert group, established by the IMO, found quite a positive image regarding the application of the ISM Code (IMO, 2005). Based on the questionnaire study, which yielded approximately 3000 responses, the expert group concluded that the ISM Code was widely accepted and the requirements of the ISM Code were implemented well in the shipping companies and ships that the respondents represented. The study indicated several improvements in the area of maritime safety management: for example, the respondents were well informed about the safety and environmental protection policies of their shipping companies, their duties and responsibilities were clearly stated, they had easy access to the required documents and training and preparedness for emergency situation was improved (IMO, 2005). The expert group regarded their study as somewhat distorted because of the weakness in their research method. The participation in the study was done on a voluntary basis. Hence, the expert group estimated that the respondents to the study had been selected to consist of those who had a positive attitude towards safety management. However, also Lappalainen and Salmi (2009) and later Kongsvik et al. (2014) have concluded that the introduction of the ISM Code has had some positive influence on safety awareness and the ISM code has been a contributor in introducing a more systematic approach to safety management in shipping.

Nevertheless, several studies have indicated serious problems with the implementation of the ISM Code. As early as in the beginning of 2000s, Anderson (2003) and a group of experts (IMO, 2005) showed that the safety management systems were too burdensome and complex, which was seen as futile bureaucracy (Anderson, 2003; IMO, 2005; see also Bhattacharya, 2009). According to Anderson (2003), in most cases the views of the ships' crew were not taken into consideration while creating the contents of

the documentation, and the education they received was not sufficient in the early stages of the ISM Code (Anderson, 2003; IMO, 2005). Later, these findings got support from Oltedal (2011), who found that the experience and expertise of the maritime personnel had not been utilised appropriately during the documentation work, which had induced inapplicable and incompatible system documentation, which did not reflect the ships' real life operations (see also Knudsen, 2009; Batalden & Sydnes, 2014; Kongsvik et al. 2014). According to Antonsen (2009b), documentation that is incompatible is likely not followed in real life operations (see also Kongsvik et al. 2014). Furthermore, Batalden and Sydnes (2014) claimed that poor instructions, checklists, and procedures were not followed by the crew, which has contributed to some serious accidents.

In their recent study, Kongsvik et al. (2014) claimed that the excessive documentation and increased paperwork has led to a bureaucratic culture and displaced the common sense incorporated in good seamanship (see also Knudsen, 2009). This claim is in accordance with Knudsen's (2009) and Antonsen's (2009b) findings. They explained the maritime personnel's reluctant attitudes towards working by formal and written rules with a concept of seamanship (Knudsen, 2009) and incompatibilities between the occupational culture of the seamen and the rule based safety management approaches (Antonsen, 2009b). According to Knudsen (2009), the seamen have an age-old belief that safety can be ensured only by seamanship that includes the professional touch and professional pride that develop only through extensive professional hands-on experience. The crew members often saw the requirements embodied in, for example, instructions as distrust towards their own competence and professional skills (Bhattacharya, 2009).

Incident reporting has been considered an important factor contributing to the sense of futile bureaucracy, because the reporting procedures were perceived as complicated and cumbersome (Lappalainen et al. 2011). Incident reporting has gained a great interest among the researcher of maritime safety culture (Anderson, 2003; Ek &Akselsson 2005; Bhattacharya, 2009; Stade, 2010; Oltedal & McArthur, 2011; Lappalainen et al. 2011). It can be claimed that the failure of incident reporting is the most significant

deficiency in relation to the implementation of the ISM Code (Ek & Akselsson, 2005; Bhattacharya, 2009; Oltedal & McArthur, 2011; Lappalainen et al. 2011).

It is shown that the seamen make incident reports very seldom (Anderson, 2003; Oltedal & McArthur, 2011; Lappalainen et al. 2011). Reluctance to report incidents among the personnel was indicated by Anderson (2003), Bhattacharya (2009) Lappalainen (2011) and Oltedal and McArthur (2011). According to Bhattacharya (2009), a major reason for poor reporting is blame culture, a fear of social sanctions for reporting, that still exists within the maritime industry (see also Anderson 2003; Ek and Akselsson 2005). Other reasons for the low number of reports were that reporting takes too much time, the onshore organisation of the shipping company reacts to the reports too slowly and the onshore organisations do not give feedback on the reports (Anderson, 2003; Ek & Akselsson, 2005; Oltedal, 2011; see also Oltedal & McArthur, 2011). In turn, Gergoulis and Nikitakos (2013) claimed that the seafarers believe that near miss reporting is more an obligation due to regulatory framework than a commitment to safety. They concluded that an increase in the amount of reporting is not necessarily an increase in safety culture level on board a ship (Gergoulis and Nikitakos, 2013). Their view is in contrast with other authors' views, in which it is claimed that safety culture is associated with a reporting culture, since a high reporting frequency is regarded as having a good safety culture (Anderson, 2003; Oltedal, 2011; see also Reason, 1997 and Wiegmann et al. 2002). Lappalainen et al. (2011) claimed that the reasons for the reluctance towards reporting seemed to originate from the maritime personnel's approach to safety work, which differs from the way the ISM Code based safety management systems are functioning (cf. Knudsen, 2009 and Antonsen, 2009b).

According to Bhattacharya (2009), the requirements of the safety management system were not complied with in respect to other areas either. According to the representatives of the shipping companies, the neglects were primarily caused by the incompetence and ignorance of the crew members. Correspondingly, the crew members felt that the requirements of the safety management system were mostly unnecessary bureaucracy. The crew members often saw the requirements as distrust towards their own competence and professional skills (Bhattacharya, 2009). Although Bhattacharya's

(2009) study included only two oil tanker shipping companies, he felt that the study results were alarming when it comes to the success of the ISM Code, because oil tanker shipping companies are generally considered to be the most advanced in the field of safety management.

It is indicated that commonly the communication between shore and shipboard personnel has failed (Bhattacharya, 2009; Goulielmos & Gatzoli, 2012; Bhattacharya & Tang, 2013; Kongsvik et al. 2014). According to Bhattacharya (2009), the major barrier for communication between the management on-shore and the personnel on-board is the geographical distance. Kongsvik et al. (2014) showed that there is a low degree of dialogue between the sharp and the blunt end and that there are not many activities designed to directly address aspects of safety culture in the companies. Managers rarely visit the vessels and thus rarely meet the maritime personnel on board (Bhattacharya, 2009; Kongsvik et al. 2014). As mentioned above, Goulielmos and Gatzoli call that management from a distance, which has led to major differences between the culture of company and the culture on-board (Grabowski et al. 2007; Bhattacharya, 2009; Goulielmos & Gatzoli, 2012). In addition, according to Bhattacharya (2009) the communication between the shore and ships is characterised by top-down control, in which the management gives orders to the ships, which diminish the employee participation in relation to safety management issues. In his later study, Bhattacharya (2012) indicated that the employee participation in the management of shipboard safety was largely absent in the maritime context.

In order to evaluate the previous studies, the following features should be taken into account. At first, most of the previous studies regarding the investigation of the impacts of the ISM Code on maritime safety culture have focused on a single country, for example, Sweden (Ek & Akselsson, 2005; Stade 2010; Ek et al. 2014), Norway (Antonsen, 2009b; Oltedal, 2011; Oltedal & McArthur, 2011: Kongsvik et al. 2014), USA (Grabowski et al. 2007), Greece (Theotokas & Progoulaki, 2007; Goulielmos & Gatzoli, 2012; Gergoulis & Nikitakos, 2013), Danish and Filipino crew members (Hansen et al. 2008; Knudsen, 2009; Grøn & Knudsen, 2011) and China (Xue at al. 2015). No comprehensive comparison between different countries and different

nationalities was found. Secondly, particularly the studies based on qualitative interviews exploring maritime safety culture have had rather restricted samples with a relatively low number of interviewees, shipping companies and different shipping sectors involved in the studies. For example, Ek and Akselsson (2005) studied safety culture on board six Swedish passenger ships, Bhattacharya (2009) studied two oil tanker shipping companies located in Europe, Stade (2010) interviewed 16 Swedish masters, DPAs and managers, Gergoulis & Nikitakos (2013) interviewed 39 people from four different shipping companies with tankers and bulk carriers of various sizes, Kongsvik et al. (2014) interviewed 35 persons among Norwegian maritime regulators and from two high-speed craft companies and Xue et al. (2015) interviewed the managers from two Chinese shipping companies and their personnel on-board four chemical tankers.

Third, the studies on the impacts of the ISM Code have been relatively few and the research methods have varied significantly. Some studies were based on questionnaires (Anderson, 2003, IMO, 2005; Ek & Akselsson, 2005; Theotokas & Progoulaki, 2007; Oltedal, 2011; Oltedal & McArthur, 2011) and some studies were based on interviews (Theotokas & Progoulaki, 2007; Bhattacharya, 2009; Stade 2010; Gergoulis & Nikitakos, 2013; Kongsvik et al. 2014; Xue et al. 2015) or document analysis (Goulielmos & Gatzoli, 2012). However, the findings of the studies correspond with each other and thus the findings can be considered to be, at the very least, indicative, while not exhaustive (see also, Bhattacharya, 2012; Xue et al. 2015). The previous studies have indicated very similar problems with the implementation of the ISM Code regardless of the country of origin or the shipping sector, for instance tanker or passenger shipping.

Fourth, Collins and Gadd (2002; see also Guldenmund, 2010) claimed that the safety culture research has tended to concentrate on the attitudes of employees, yet little research has been conducted to discover the management's attitudes and commitment towards safety. That is the case with studies focused on the impacts of the ISM Code also. Only few studies have focused on evaluating the management's commitment in the shipping industry. The literature review showed that the previous studies aiming to

determine the efficacy of the ISM Code have focused mostly on investigating the attitudes of the ships' crews (for example, Ek & Akselsson 2005; Bhattacharya 2009; Knudsen 2009; Gergoulis & Nikitakos, 2013). For example, Bhattacharya (2009) interviewed the management merely in order to find out their considerations on how well the ship's crew complies with the requirements of the ISM Code on board.

Lastly, the functional approach has been predominant when defining and studying safety culture (Richter & Koch, 2004; Guldenmund 2010). That is the fact with regard to the ISM Code related studies also. The functional theory presumes that the culture can be changed and manipulated, the management is able to control and change the safety culture and that there is an ideal state that the organisation should aspire to (Richter & Koch, 2004; Reiman et al. 2008). These conceptions are represented strongly in the previous studies of the impacts of the ISM Code. The dogma behind the ISM Code has not been challenged at all, and the model of an ideal and integrated safety culture has been taken as granted, although several studies have indicated that safety culture is seemingly differentiated within a shipping company and there are differences between the shore-based management and the ships. Moreover, the previous studies have indicated that the implementation of the ISM Code has been successful only partially in entrenching the safety culture in shipping.

To sum up, the postmodern approach challenges both the functionalist and the interpretive approaches in several ways. Both of the latter approaches are seeking for a uniform and integrated culture, which is a very top-down management view of cultural formation that underplays the diversity of cultural forms in an organisation (Alvesson, 2002: McAuley et al. 2007). An organisational culture is more often rather ambiguous and fragmented than in harmony and sharing common values and norms (Alvesson, 2002; Haukelid, 2008; Richter & Koch, 2002). Alvesson (2002) states that the variations, fragmentations and inconsistencies in interpreting and understanding cultural manifestations have to be taken into account, while studying the organisational culture (Alvesson, 2002). Generally, the interpretive and postmodern approaches have not been taken into account in the previous studies regarding the ISM Code and maritime safety culture. Both Knudsen (2009) and Antonsen (2009a) provided an exception to that.

They recognised that the maritime personnel have a different approach to safety culture. Understanding the multiple perspectives on safety culture requires multiple theoretical perspectives and methodological approaches. That is why this study is based on a dialogue between the leading approaches on organisational and safety culture.

4 METHODOLOGY AND EMPIRICAL MATERIALS

4.1 Methodological perspectives on organisational culture and safety culture

According to Guldenmund (2010; 2014), the choice of a paradigm determines which research methodology should be chosen in order to study safety culture. This is a question of ontology and epistemology (Guldenmund, 2010). Guldenmund (2010) complains that the paradigm and ontological and epistemological issues are seldom addressed explicitly in safety culture research. This is also the case with the studies regarding the impacts of the ISM Code. The researcher should make clear his/her premises by asking if there is a safety culture "out there" or is the outcome of the research more or less a construction of a particular researcher (Guldenmund, 2010).

When safety culture is viewed from a functionalist point of view, the analysis is based on the "modern" organisational analysis (Harisalo, 2008). The ontology of modern organisational analysis emphasizes a conception in which the organisations represent a reality that is independent of the people's knowledge (reality is objective) (Harisalo, 2008; Guldenmund, 2010). According to Guldenmund (2010), there is a safety culture "out there", which is measurable by quantitative methods that include, for example, formal questionnaires and highly structured interviews or the statistical analysis of measured data on the production or business processes (McAuley et al. 2007; Harisalo, 2008; Guldenmund, 2010). The emphasis of modern organisational analysis is on the organisations' structures, processes and various repetitive practices that are independent of the subject. (McAuley et al. 2007; Harisalo, 2008; see also Guldenmund, 2010).

The interpretive perspective on safety culture can be seen to be based on the hermeneutic[7] philosophy of science and Harisalo (2008) calls the related methodology symbolic-interpretive organisational analysis (see also McAuley et al. 2007). The

[7] According to Gadamer (2004), the research process resembles a hermeneutic circle in which pre-understanding and understanding alternate (Gadamer, 2004). In the beginning of a research, the researcher has some kind of a preconception of the subject, based on which the study is channeled into research questions. Performing the research task produces information that is refined by interpretation into understanding in the form of answers to the research questions. Yet, during the research process such issues also emerge that cannot be properly explained based on the pre-understanding on the matter. Therefore it is required to go back to the theory, based on which new and more precise research questions can be formed.

ontology of symbolic-interpretive organisational analysis focuses on the people's subjective experiences and the meanings they give to the things they have experienced (McAuley et al. 2007; Harisalo, 2008; Guldenmund, 2010). According to symbolic-interpretive analysis, the organisation does not represent objective reality but is an interpretation that exists in people's minds, a sort of a mental structure (Guldenmund, 2010). Because their conceptions about the organisation are formed in people's minds, it is important to research what kind of factors have collaborated and resulted in the forming and building of these conceptions in different situations and conditions (McAuley et al. 2007). The epistemology of symbolic-interpretive analysis requires the use of interpretive methods in order to identify interpretations and meanings. Hermeneutics or understanding is the most essential method in symbolic-interpretive analysis (Harisalo, 2008).

The postmodern perspective on organisational analysis challenges the ontological and epistemological assumptions of the functionalist and interpretive approaches (Schultz & Hatch, 1996; McAuley et al. 2007). Schultz and Hatch (1996) see postmodernism more like a critical movement than a consistent theory or a methodological framework. The ontology of postmodern organisational analysis emphasizes a conception in which the representation or the language constitutes reality (Fairhurst & Putnam, 2004; McAuley et al. 2007).

According to McAuley (2007) both the functionalist and interpretive perspectives of organisation culture are based on the positivist assumption that a researcher can neutrally interpret and represent the experiences and the meanings of the participants in a study (McAuley et al. 2007; see also Guldenmund, 2010). The epistemology of postmodern organisational analysis denies that a researcher could provide an accurate representation of the views of the participants in a research project (McAuley et al. 2007) and states that the representation of the views cannot be objective and neutral (Martin, 2007). The representation of the research results reflects, more or less, the researcher's political ideology or interests (Martin, 2007).

The concept of *"discourse"* is introduced to refer to the subjective means by which people organize what they perceive (McAuley et al. 2007; Fairhurst & Putnam, 2004). McAuley et al. (2007) define discourses as*"subjective, linguistically formed ways of experiencing and acting and constituting phenomena that we take to be 'out there'".* According to McAuley et al. (2007), the concept of discourse is based on Michel Foucault's thoughts on how a dominant discourse is taken for granted by people and not challenged. The dominant discourse limits knowledge and practices by excluding alternatives (McAuley et al. 2007; Fairhurst & Putnam, 2004). The postmodernist organisational analysts criticise that the dominant discourse represents the views of the elite or top management and dictates what is appropriate and correct (McAuley et al. 2007; Martin, 2007).

The postmodern organisational analysis attempts to challenge the dominant discourse by recognising that there are many different views to any situation (McAuley et al. 2007). The research should focus on different perspectives and focus on areas not usually studied and persons who are less powerful (Schultz & Hatch, 1996; McAuley et al. 2007: Martin, 2007). According to McAuley et al. (2007), the postmodern organisational analysis attempts to produce a new form of knowledge by crossing disciplinary boundaries. From the methodological point of view the postmodernists suggest *"paradigm interplay"* between different approaches to culture (Schultz & Hatch, 1996).

The following table (4) summarises the ontological and epistemological features of the different approaches to safety culture.

Table 4.Methodological perspectives of safety culture (McAuley et al. 2007; Martin, 2007; Guldenmund, 2010)

Safety Culture	**Ontology**	**Epistemology**	**Methodology**
Functional approach	Reality is objective; safety culture is based on empirically observable things: structures, processes and practical working methods	The features of safety culture can be measured and manipulated in order to solve problems and improve operations	Quantitative measurement: Statistical method, Questionnaire studies, Inductive reasoning based on facts
Interpretive approach	Reality is subjective: safety culture is based on people's subjective experiences and the meanings they give to those experiences	The subjective experiences and the meanings can be interpreted and understood "objectively" by the researcher; researcher is assumed to be neutral	Qualitative studies, Hermeneutics
Postmodern approach	A representation constitutes reality: safety culture is created and determined by people's subjective acts of perception.	The subjective nature of culture cannot be interpreted objectively and the researcher cannot be neutral Research is always inaccurate and politically biased and a representation of one's interests	Discourse analysis Paradigm Interplay

According to Guldenmund (2010), safety culture should be approached from several methodological perspectives, which is why safety culture should not be studied using only the quantitative methods of modern organisational analysis based on a positivist philosophy of science; but the symbolic-interpretive methods based on a hermeneutic philosophy of science are not sufficient by themselves either (Guldenmund, 2010). By examining safety culture from several methodological perspectives, one may gain a more versatile and holistic overview of the cultural factors at play (Guldenmund, 2010). By using several methodological perspectives, there is a better possibility to understand, for example, the ambiguities and conflicts (Richter & Koch, 2004).

Categorizing organisational theories by methodological perspective can be problematic. According to Harisalo (2008), different theories cannot necessarily be categorized into only one perspective (see also Demers, 2007). There can be significant contradictions and opposition between the theories categorized under the same perspective. They can also compete with each other in order to explain different phenomena (Guldenmund, 2010).

The research of safety culture has mostly been based on a positivist philosophy of science. This is due to the fact that, in principle, safety culture is considered to be functional (Reiman et al. 2008). According to Reiman et al. (2008), safety culture has mostly been studied from a functional perspective by using quantitative research methods. Quantitative methods are used when you are trying to find out, for example, the level of safety culture or safety management or what is the level of safety performance in an organisation (Reiman, 2008; see also Pidgeon 1998).

Qualitative methods are applied in interpretation- oriented safety culture studies. (Reiman et al. 2008; Glendon & Stanton, 2000). By using qualitative methods, the aim is to find out what the safety culture is like or why the safety culture is what it is. Interpretive safety culture theory assumes that the basic assumptions and intermediate level, that is values and attitudes, can be studied mainly using qualitative methods. Qualitative methods include, for example, ethnography, thematic interviews and observations (Guldenmund, 2000; Glendon & Stanton, 2002).

Studies on safety culture that are based on approaches other than the functional approach are rare (Reiman et al. 2008; Martin, 2007; Antonsen, 2009a). Yet, safety culture research actually requires the combining of the different approaches.

In sum, the organisation culture can be approached from several methodological perspectives, which is why safety culture cannot be unambiguously studied with mere quantitative methods of modern organisational analysis based on positivist philosophy of science, but neither with mere symbolic-interpretive methods based on hermeneutic philosophy of science. By examining safety culture from several methodological perspectives one may gain a more versatile and holistic picture of cultural factors. By using several methodological perspectives, there is a better possibility to understand, for example, the ambiguities and conflicts. From the postmodern perspective, it is not a question of methodology, but rather a question of the viewpoint of the researcher. The postmodern perspective challenges the top-down management view of cultural formation. Instead, it suggests putting the focus on the perspectives of the less powerful people. Moreover, postmodern approach suggests paradigm interplay and the

application of multiple methods. Nevertheless, this study is based on the qualitative approach, because it is seldom applied in the case of the ISM Code. The study seeks to apply paradigm interplay by providing a comprehensive comparison of the result with the results of previous studies. This study does not merely aim to assess how the features of good safety culture have been internalised ideally, but it seeks to understand the viewpoints of the interviewees on safety management and safety culture.

4.2 Chosen research methods

Interviews were applied as the major research method for this study. The interviews were done in two phases. The first round of interviews were done as open interviews or un-structured interviews (Hirsjärvi & Hurme, 2001; King, 2004; Firmin 2008) during the late autumn of 2007 and in the early spring of 2008. Open interviews are the most informal of all interview types. During the interviews, no pre-prepared questions were used but the research topic was dealt with through discussions. The topic of the discussion was the effect of the ISM Code on maritime safety and safety culture in general. The purpose of the interviews was to introduce the research topic to the shipping companies and to the authorities, create a preliminary survey on the viewpoints related to the research topic and to form agreements on the practical arrangements regarding the research. Performing the open interviews before the actual thematic interview round in the field fulfilled several purposes. The most significant advantage was the gaining of basic information about the Finnish practices relating to the ISM Code and maritime safety management both in shipping companies and in relation to the authorities' actions. This guided the decision on the final research methods. Thematic interviews, which were directed at the ships' crews and, on the authorities' side, at the maritime inspectors performing ISM audits, were chosen as the most important research method.

The second interview round performed in the field was launched in August 2008 and ended in March 2009. The field interview study was based on a thematic interview method or semi-structured interview (Hirsjärvi & Hurme, 2001; King, 2004; Firmin, 2008), which can be placed somewhere in between questionnaire based interviews and open interviews (King, 2004; Firmin, 2008). Thematic interviews do not proceed

according to detailed, pre-formed questions but more freely by focusing on certain pre-planned themes. Those pre-planned themes were based on themes chosen on the basis of the literature research and open interviews, which were in relation to the requirements of the ISM Code and characteristics of good safety culture introduced in literature. The themes used in the interviews were the same for each interviewee, but the interviews proceeded flexibly between the themes and often in a random order. The interviews were very much like discussions and space was given to the interviewees' free speech, so that the issues that the interviewees consider the most important would come up. Thus, the people's interpretations and given meanings could be taken into consideration in the interviews. Not every issue was discussed with each interviewee in the same depth, but the aim was to discuss all the main themes of the research to the extent that the interviewee has something to add to the theme. (see Kvale, 1996; Hirsjärvi & Hurme, 2001; Saaranen-Kauppinen & Puusniekka, 2006).

During the interviews, a form describing the main themes of the study and including helpful questions and key words related to the main themes was used. These questions could be used to launch a discussion (Hirsjärvi & Hurme, 2001; Mason, 2004; Eskola & Vastamäki, 2007). Notes about the interviews were written immediately on the applied interview form during the interviews. Up to 21 interviews were also recorded, provided that the interviewee granted permission and that the conditions of the interview allowed it. For example, recording was out of the question in the ships' engine rooms or mess because of the noise in the environment. Afterwards, based on the recordings, details could be checked out and interview forms could be completed.

In addition to the researcher, a research assistant also took part in performing the interviews, in which case the use of recordings enhanced the usability of the information gathered by another person. Otherwise, the activities of the research assistant were focused on another study that was also directed at ships and their crews. The topic in this other research project was the data collected in connection with safety management and its possible usability as a maritime safety indicator. In this respect, the researchers practiced reciprocal cooperation to avoid overlapping visits on the same ships.

From the point of view of this research, there are clear advantages that can be gained by using thematic interviews instead of structured interviews. In thematic interviews, the interviewees can better specify and explain the reasons for, for example, the deficiencies in maritime safety management found in earlier ISM Code related studies (King, 2004). Naturally, the safety management matters that are considered to be positive and successful are also brought up and explained in the interviews. This serves the safety culture analysis based on functional theory, the aim of which is to find out how well the requirements set by the ISM Code have been fulfilled. In addition, assuming that we want to analyse safety culture from an interpretive point of view, there are the interviewees' personal interpretations and given meanings, based on which it is possible to gain information about possible cultural changes related to deeper constructions of culture (King, 2004).

The thematic interview method also has some weaknesses, which are related to the analysing of the gathered data and the interview situations. When the interviewees are using their own words, it can be difficult to interpret the answers for the purpose of data reduction. This topic will be further discussed in chapter 4.3 Qualitative analysis. The researcher's pre-understanding, which can be biased, can affect the interviewer's views on what he considers important enough to make notes of (King, 2004; Guldenmund, 2010). Thus, the interview data may not describe the subject but the interviewer's expectations. This problem was mitigated by recording the interviews. The fact that some of the interviews were done by the research assistant can also enhance the objectivity of the conclusions drawn based on the interview data. In addition, analysing the results of interview research is laborious and interviews take a lot of time (Hirsjärvi & Hurme, 2001; King, 2004).

While analysing interview results, you have to take into consideration that the interviewees may strive to give a better image of their actions than what the true situation is. The interviewees may try to give answers that are in line with expectations or socially acceptable. The interviewees may also understand the asked issue in a different way than the interviewer has meant (Hirsjärvi & Hurme, 2001; King, 2004). In this respect, efforts have been made to enhance the credibility of the results by asking

different things from different stakeholder groups such as, shipping company management, ship's crew and authorities. In addition, the conformity or possible contradictions in the issues discussed during the interviews can be compared to the results of the observations of ISM audits and safety drills.

Observations were another research method used in this study. By making systematic observations, it is possible to gain information on whether people actually act the way they say they do (Jorgensen, 1989; Adler & Adler, 1994; DeWalt et al. 2010). By observing practical operations it is possible to find out people's appreciations, whether you can trust the people's word and how they act in reality (Jorgensen, 1989). Scientific observation requires systematic observation (Saaranen-Kauppinen & Puusniekka, 2006; DeWalt et al. 2010).

Observations were conducted by taking part in the external ISM audits performed by the maritime inspectors and the internal ISM audits performed by the shipping company. In addition, observations were conducted by observing the safety drills that were performed during the ISM audits and during the researcher's visits on board the ships. The themes used in the thematic interviews were also used as a basis for the observations so that the observation would be systematic. The field notes from the observations were written down in memos (Baker, 2006). Despite this, observations cannot be considered to be structured as such (DeWalt et al. 2010; Saaranen-Kauppinen & Puusniekka, 2006). The audits proceeded based on the plan made by the auditor (not the researcher) as the safety drills proceeded according to the plans made by the ship's master or the mate responsible for the drill.

For this study, the observations were used to complement and support the interviews. With observations, it is possible to gain direct information about the action and behaviour of a person, groups or organisations (Jorgensen, 1989; DeWalt et al. 2010). Observations allow an access to the natural environment of the event that is the ships (Jorgensen, 1989; Adler & Adler; 1994). Observation as a method is suitable for, for example, studying interactions between people (the crew and the officers). Similarly, observations are suitable for studying the interactions between the person performing audits and the personnel of the audited ship. Through observations, you can study

events that are changing quickly or are difficult to predict (Saaranen-Kauppinen & Puusniekka, 2006). In the safety drills on board, the situations change really fast and unforeseen occurrences come up often. It is actually the purpose of the drills to reveal new unforeseen issues, from which it is possible to learn.

The observations related to ISM audits were participant observations (Saaranen-Kauppinen & Puusniekka, 2006; DeWalt et al. 2010). The researcher had the opportunity to make questions related to safety management both to the auditor and the personnel of the audited ship. Correspondingly, the observation of safety drills was non-participant observation (Saaranen-Kauppinen & Puusniekka, 2006; DeWalt et al. 2010). The researcher's job was merely to observe and stay out of the way. Being allowed to take pictures of the safety drills, the researcher did not have to take notes on everything and was able to focus on observing the situation (see Saaranen-Kauppinen & Puusniekka, 2006; Baker, 2006). By using the photographs, it is possible to go back to the situation later, during which such things can come up that the researcher could not pay attention to as the situations progressed so rapidly. Using the photographs, it was also possible to complement the field notes (Baker, 2006).

The problem with observation can be the control effect, since the researcher can disturb with his presence or even change the observed situation (Saaranen-Kauppinen & Puusniekka, 2006; DeWalt et al. 2010). In this study, this is probably not a problem, since there already was a strong control effect in the audits and the safety drills related to the audits because of the outside auditor. Yet, the researcher cannot be a complete outsider. Observations are also subjective and selective. When observing, different people pay attention to different things. The researcher's expectations may steer his attention. (Saaranen-Kauppinen & Puusniekka, 2006; DeWalt et al. 2010).

4.3 Qualitative content analysis

An adaptation of qualitative content analysis was chosen as the analysis method for this study (Elo & Kyngäs, 2008; Forman & Damschroder, 2008; Vaismoradi et al. 2013). The process of qualitative content analysis has been divided into phases in several ways (Elo & Kyngäs, 2008; Forman & Damschroder, 2008; Vaismoradi et al. 2013). Forman

and Damschroder (2008) propose that content analysis be divided into three phases: immersion, reduction, and interpretation. Respectively, the content analysis could be divided into a preparation phase, an organising phase and a reporting phase (Elo & Kyngäs, 2008; Vaismoradi et al. 2013). A deductive approach to content analysis was applied in this study. The deductive approach is based on an earlier theory or model and the structure of analysis is operationalised on the basis of previous knowledge (see more, for example, Elo & Kyngäs, 2008). In this study, the data collection was based on the method of thematic interviews. The themes or the key topics of the thematic interviews were formed on a theoretical basis, thus the division into themes was based on a certain frame of reference or theory (Eskola & Suoranta, 2008). In this study, the themes used in the thematic interviews were derived from the characteristics of "good" safety culture that were introduced in chapter 2 and the requirements of the ISM Code.

The stages of qualitative content analysis are described in the table below (Table 5).

Table 5. Phases of the Qualitative Content Analysis (Adapted from: Elo & Kyngäs, 2008; Forman & Damschroder, 2008; Vaismoradi et al. 2013).

Phases	**Tasks**	**Results**
Immersion	Transcription of the interview data	Interview data collected in memos and recordings
Reduction	Data examination and combination	Reduced data; findings
Interpretation	Interpretation, triangulation	Answers to the research questions and conclusions

In the immersion phase, the interviews are transcribed and the transcripts are read through several times in order to obtain the sense of the whole (Forman & Damschroder, 2008; Vaismoradi et al. 2013). During this study, the notes were written simultaneously during the course of the interviews. Notes were written on the form that was used during the interviews. Because of the interview method, the topics did not come up in the same order as the themes in the question form. In addition, there was not enough time to write all of the answers under the right theme. Therefore, the notes had to be transcribed later. During the transcription, the notes were organized under the right themes and the recordings of those interviews that could be recorded were also listened to in order to complement the transcriptions. After that, the transcribed and thematically

ordered interview data was transferred into an Excel worksheet, in which the data was organized into a matrix. The columns of the matrix comprised of interview themes and related detailed questions. The rows of the matrix consisted of the answers of each interviewed person.

The purpose of the matrix was to facilitate the examination of the data during the next phase of the content analysis, which was the reduction phase (Forman & Damschroder, 2008). During the reduction phase, the results of the interviews were combined based on how uniform or divergent the answers were. In this stage, the original statements from the interviews had to be interpreted, so that the various statements given using different words could be combined into categories and integrative concepts. As a result of combining the data, reduced data was produced and then categorized based on the research themes.

The themes derived from theory were used in qualitative analysis while reducing the results of the interviews. There were two tasks in data reduction, the first of which was examining the data. The purpose of data examination was to separate the data that was relevant and important for the research task from raw data (Alasuutari, 1993; Forman & Damschroder, 2008). According to Alasuutari (1993), the identification of relevant and important data is based on the theoretical framework of the study, or in this case the themes derived from the theoretical framework of safety culture and safety management and the viewpoints obtained from the first-round interviews. The matrix developed to process the data was applied in the examination. In practice, the data examination was done by reading the interview data while searching for similarities and differences, among other things.

The reduced data provided a basis for the interpretation phase (Forman & Damschroder, 2008). According to Braun & Clarke (2006), interpretation is an attempt to theorise the significance of the patterns and their broader meanings and implications, often in relation to previous literature. In the interpretation phase, you perform interpretation of meaning based on the reduced data, which is based on the safety culture theory and earlier studies regarding the effects of the ISM Code. The conclusions of the qualitative

analysis are formed as a result of the interpretation of meaning (Alasuutari, 1993). According to Forman and Damschroder (2008), even though the analysis process is presented as a series of sequential phases, the analysis is an iterative process, in which the interpretation should occur concurrently with data collection, ordering and reduction.

In this study, both theoretical triangulation and data triangulation was used in order to facilitate the interpretation. In data triangulation, the data collected from the thematic interviews is compared with the results from the observation of audits and safety drills. Dividing the interview data by different answer groups allows comparison between the groups. The theoretical triangulation is based on the different perspectives of organisational culture theory. (Saaranen-Kauppinen & Puusniekka, 2006; Forman & Damschroder, 2008; Guldenmund, 2010)

4.4 Research material

The research material consists of 94 interviews of people (see Table 6) representing the Finnish maritime industry as well as observations on board (see Table 7).

The study focused on shipping companies and ships, which the ISM Code applies to (EC No 336/2006). Furthermore, the study was aimed at Finnish shipping companies, which operate using various types of cargo ships and passenger ships engaged in international voyages. These are the ship types covered by the Regulation Article 3 paragraph 1a (EC No 336/2006).

The aim was to include all important shipping business areas in the study. The number of shipping companies and ships studied was limited by the timeframe of the study and the availability of shipping companies that were willing to participate in the study.

The target population was limited to the personnel and the management of the shipping companies that were involved in the study. The target group was extended to cover other maritime stakeholders such as maritime inspectors, pilots and accident investigators, who were dealing with ISM Code related issues in their daily work. Other

important stakeholder groups in relation to the ISM Code are classification societies, nautical schools and academies, insurance companies and P&I Clubs. These groups were excluded from the study due to the timeframe of the study.

Even though shipping is highly international and the ships' personnel are multinational and multicultural (see for example Berg et al. 2013) persons of nationalities other than Finnish were mostly excluded from the study due to the fact that the study was carried out as a part of the METKU Research Project, which was limited to study only the Finnish maritime industry. As an exception, two interviewed members of ship personnel were Estonian citizens, who had worked for the Finnish shipping companies for several years.

Approximately two thirds of the interviewees had such long careers as seafarers that they had been in their occupations before the ISM Code came into force. Several of the interviewees had also been involved in the forming of the ISM Code based safety management system, either in the shipping company or on board the ships.

Table 6. The interviewees (2007 – 2009)

Active Seafarers		
Masters		15
Deck officers		21
Engineering officers		10
Crew members		5
Hotel and catering staff		11
	Subtotal	**62**
Management (DPA's and top management)		
Maritime working experience		10
No maritime working experience		4
	Subtotal	**14**
Other interviewees		
Pilots		4
FMA Maritime Inspectors		8
FMA* (other officers)		4
FAIB*		2
	Subtotal	**18**
	Total of Interviewees	**94**

Note: * participated into the preliminary open interviews

The crew members' share of the interviewees was small. According to the Annual Statistics of Maritime Occupation (Trafi, 2010), crew members formed approximately half of the workers in maritime occupations during the years of the field study. Of the personnel working on decks, approximately half belong to the crew members group and half are officers. In the engine room, the amount is slightly less than half (Trafi, 2010). The number of persons working in different seafarer occupations in 2009 was 9 657 persons (Trafi, 2010).

Crew members were slightly more difficult to get an interview from, since, in practice, interviewing them would have meant that they would have to be interviewed during their leisure time. In comparison, the officers could be, in most cases, interviewed while on the watch if the traffic situation allowed it so that safe navigation was not compromised. Interviewing the hotel and catering staff on the passenger ships would also have, in practice, required interviewing them during their free time. Otherwise they would have had to interrupt their duties. Only few such persons were interviewed.

The interview group of the shipping companies' management included the top management and safety management. Nearly all of the interviewees had maritime working experience. Four of the interviewees that represented the shipping company management had no maritime working experience in practice. Other interviewees representing the management had maritime working experience either as deck officers or as ship's masters as well as experience applying the ISM code on board.

The maritime inspectors of the Finnish Maritime Administration (FMA) were responsible for conducting external ISM Audits in shipping companies and on vessels. The purpose of ISM Audits is to verify that safety management systems are compliant with the ISM Code in shipping companies and on vessels. In addition, they were responsible for carrying out the Port State Control inspections of foreign ships visiting Finnish ports.

All of the pilots and maritime inspectors who were interviewed had been active seafarers before their engagement in Finnpilot (Finnish State Pilotage Enterprise) or the FMA. The answers of the pilots were included in the deck officers' results due to the small number of interviewees.

The other officials of the FMA and two maritime accident investigators of the Finnish Accident Investigation Board (FAIB) were interviewed during the preliminary interviews. The officials of the FMA and the FAIB provided useful background information about issues relating to the ISM Code. The officials of the FMA and the accident investigators of the FAIB were not interviewed using the semi-structured questionnaire (marked * in Table 6). These interviews were carried out as open discussions. The results of the interviews with representatives of public administration concern the entire maritime sector, not only the shipping companies involved in the research project.

There were seven shipping companies involved in the study and they widely represent the Finnish shipping business. The shipping companies involved in this study were Bore, Finnlines, Finstaship (currently Arctia Shipping), Kristina Cruises, Langh Ship,

Neste Shipping and VG-Shipping. During the study, 16 ships were visited. These shipping companies represented all the important business areas, i.e. passenger vessels, cruising business and all types of cargo vessels. The ships were engaged in liner traffic, time charter and voyage charter. The ownership of the companies varied. Four companies were family-owned companies, while one was state-owned. Two companies were stock exchange companies. The size of the fleet and the personnel varied. The vessels that were visited sailed under the Finnish flag, except for one that sailed under the flag of Gibraltar.

Each one of the shipping companies supported the research project by allowing the examining of their safety management systems, by giving an access to their vessels, by giving permission to interview their management and personnel and by providing additional information concerning their safety management systems.

Bore was founded in 1897 and it is owned by the family company Rettig. At the time of the interviews, the Bore fleet sailed on the Baltic Sea and the North Sea. Bore was expanded through the acquisition of Rederi Ab Engship and Bror Husell Chartering companies in 2005-2006. At the time of the interviews, the company's fleet consisted of 22 ships, which comprised of Ro-Ro vessels, general cargo vessels, car carrier vessels and a bulk vessel. Bore had approximately 500 employees, both seafarers and office staff. Today, Bore's ships sail under both the Finnish and the Dutch flag. Three vessels were visited during the study, which were the Ro-Ro ship Estraden, car carrier Autobaltic and bulk ship Belgard. All vessels were visited at port.

During the study period, Finnlines provided Ro-Ro and passenger services in the Baltic Sea and the North Sea. Finnlines was listed on the NASDAQ OMX Helsinki and Finnlines Ltd. was part of the Grimaldi Group, one of the world's largest shipping companies. The number of personnel employed by Finnlines was approximately 1,500 people. Finnlines' safety management system was applied on 19 vessels. In addition, Finnlines had 30 vessels owned by other shipping companies assigned to it by a charter agreement. Three vessels that fly the Finnish flag were visited during the study. These were the Ro-Ro passenger ships Finnstar, Finnmaid and Finnhansa. Two vessels were

visited during their voyage from Helsinki to Travemünde. One vessel was visited in its homeport in Helsinki.

At the time of the interviews, Finstaship (currently Actia Shipping) was a stated-owned shipping company which offered icebreaking and fairway services for general shipping needs, specialised offshore and marine construction services, as well as ship management and ferry services. The Finstaship fleet consisted of three multipurpose vessels, six icebreakers, several special ships for fairway maintenance and marine construction services and several vessels for ferry operations. Two vessels were visited, but the seafarers that were interviewed also included personnel from other vessels.

During the study period, Kristina Cruises was a family-owned shipping company, which was founded in 1985. Kristina Cruises operated with two passenger ships, m/s Kristina Brahe and m/s Kristina Regina. M/s Kristina Regina was operating all year round. In spring 2001, the renovated m/s Kristina Regina began a series of Mediterranean cruises. Summer destinations traditionally included several ports in the Baltic Sea, Norwegian fjords and cities in Northern Europe. During winter seasons 2001 – 2007, the ship sailed around the Canary Islands and East coast of Africa (Gambia, Cap Verde and Senegal). During the winter season 2008 – 2009 the ship sailed on the Red Sea. During the period of open water, m/s Kristina Brahe sailed in the Gulf of Finland, the Saimaa Canal, Lake Saimaa and Lake Kallavesi. The personnel of Kristina Cruises numbered approximately 130 people. Both m/s Kristina Brahe and m/s Kristina Regina were visited during their sea voyages. Now Kristina Cruises has sold both ships and is operating only as a travel agency.

At the time of the interviews, Neste Shipping was a part of Neste Oil Company that was listed on the NASDAQ OMX Helsinki. The biggest shareholder in Neste Oil was the Finnish state. Neste Shipping transported around 40 million tons of crude oil, petroleum products, and chemicals annually, primarily on the Baltic, the North Sea, and the North Atlantic. Neste Shipping had more than 30 vessels in its fleet, with a total tonnage of over 1 million tons. All vessels were ice-reinforced and feature a double hull. Six tankers were fully owned and three 50 % owned by Neste Oil, while the others were chartered. Neste Oil used around one half its tonnages for its own needs, and offered the

remainder in the international market to international oil companies and brokers. Neste Shipping employed around 510 people, approximately 430 of whom work at sea and around 80 in the office. Neste Oil transferred its ship management functions to OSM Ship Management Finland Ltd on April of 2014. The interviews were made in the office.

During the study period, Langh Ship was a family-owned Finnish cargo shipping company. The fleet consisted of five cargo ships specialised in container cargo and steel coil transportations. Langh Ship has developed a solution for transporting heavy steel coils. This solution was called the Cradle Tween Deck, where heavy coils can be loaded in several layers. The interviews were made in the office.

At the time of the interviews, VG-Shipping was a privately owned Ship Management company established in 1995. VG-Shipping operated and managed nine vessels. VG-Shipping owned and operated two dry cargo vessels and one ship specialised in heavy cargoes. The ships of VG-Shipping sailed under the flags of both Finland and Gibraltar. Two vessels, Mirva and Eeva, were visited during the study. Both of the vessels were engaged in dry cargo transportations.

Table 7 presents the visited ships and the location and date of the interviews and observations.

Table 7. Visited Ships

Date	Ship	Owner	Ship type	Location/Route/ Sea area	Purpose
21.07.2008	M/V Estraden	Bore	Ro-Ro Cargo Ship	Port of Turku	Interviews
26.07.2008	M/S Mirva	VG-Shipping	Cargo Ship	Port of Kotka	Interviews
21.08.2008	M/S Kristina Brahe	Kristina Cruises	Passenger ship	Helsinki – Kotka	Observations; External audit by FMA and evacuation exercise
23.08.2008	M/S Kristina Brahe	Kristina Cruises	Passenger ship	Kotka - Helsinki	Interviews and observations
22.10.2008	M/S Finnmaid	Finnlines	Ro-Ro Passenger Ship	Port of Helsinki	Observations; Internal audit by company DPA and evacuation exercise
24.10.2008	M/S Finnhansa	Finnlines	Ro-Ro Passenger Ship	Port of Helsinki	Observations; External audit by FMA and collision exercise
27.10. – 28.10.2008	M/S Finnmaid	Finnlines	Ro-Ro Passenger Ship	Helsinki –Travemünde	Interviews and observations
29.10. – 30.10.2008	M/S Finnstar	Finnlines	Ro-Ro Passenger Ship	Travemünde –Helsinki	Interviews and observations
06.11.2008	M/V Auto Baltic	Bore	Sto-Ro Car carrier	Port of Kotka	Interviews
10.11.2008	M/S Belgard	Bore	Bulk carrier	Port of Kotka	Interviews
13.12. – 20.12.2008	M/S Kristina Regina	Kristina Cruises	Passenger ship	Red Sea	Interviews, observations and lifeboat exercise
12.02.2009	M/S Eeva	VG-Shipping	Bulk carrier	Port of Kotka	Interviews
11.03.2009	MSV Nordica	Finnstaship	Multipurpose icebreaker	Port of Helsinki	Interviews*
03.02.2009	M/S Urho	Finnstaship	Icebreaker	Port of Helsinki	Interviews*
14.10.2009	M/V Seagard	Bore	Ro-Ro Container Vessel	Port of Hanko	Observations; Internal audit by company DPA, fire drill

* Research assistant

The ISM Code was introduced in the ships participating in the study at slightly different times. The ISM Code became compulsory on passenger ships in the beginning of July 1996. On those ships, the formation of the necessary systems took place from 1994 to 1995. On tankers and bulk ships, the system became compulsory in the year 1998. On those ships, the formation and implementation of the safety management system was carried out during the years 1996 and 1997. On the rest of the ships the year in which the ISM Code became compulsory, was 2002.

The observations were made on board six ships (see Table 7 Visited Ships). M/S Kristina Regina and M/S Kristina Brahe were passenger ships and the observations were made during their voyages. M/S Finnhansa, M/S Finnmaid, M/S Finnstar were Ro-Ro passenger ships. The observations on M/S Finnmaid and M/S Finnstar were made partly at port and partly during their voyages. M/V Seagard was a Ro-Ro cargo ship. The observations on M/S Finnhansa and M/V Seagard were made at port. Observations were conducted by taking part in three external ISM audits performed by the maritime inspectors of the Finnish Maritime Administration and two internal ISM audits performed by the DPAs of the shipping companies. During the voyages of M/S Finnmaid, M/S Finnstar and M/S Kristina Brahe, there were opportunities to make observations by visiting the engine rooms, the bridges and the mess rooms of the ships.

Both the external audits and the internal audits followed a similar manuscript. The audits proceeded based on the plan made by the auditor and the safety drills proceeded according to the plans made by the ship's master or the mate responsible for the drill. The Audits started by an opening meeting. During the opening meeting, the ship's documentation was scrutinised by the auditors. For example, the muster lists, records from the previous audits and incident reporting were checked during the opening meeting. After the opening meeting, the audits continued as a "grand tour" on the ships. Typically the auditors visited the bridge, the engine room and the cargo office. During the tour, the auditors interviewed the personnel on their duties. The audits ended with the safety drills. Finally, there was a closing session, during which the auditors and the master discussed the findings and particularly the nonconformities found during the audit. Finally, the auditors issued a safety management certificate to the ship.

5 RESULTS OF THE STUDY

This chapter presents the key findings obtained from the interviews and observations. Chapter six analyses and interprets the findings in relation to the previous studies regarding the ISM Code and maritime safety culture. The results of the interviews are represented based on the personnel groups as follows: masters, deck officers, engineering officers, crew members, hotel and catering staff, management and maritime inspectors. Hence the different perspectives of each group could be shown separately. This enables comparison between groups and reveals how the groups see themselves in relation to safety culture and safety management.

The results could also be arranged and then analysed based on, for example, the different types of ships or the shipping companies. There were passenger ships, Ro-Ro passenger ships, Ro-Ro cargo ships, tankers and bulk carries involved in the study. Only a few interviewees brought up differences based on the different types of ships during the interviews. Those comments are included in their respective sections in the text. The analysis did not bring out significant differences between the shipping companies and the ship types and because of that, the results are represented based on the personnel groups.

The research themes that emerged during the observations were communication on-board between the crew members and the officers, employee participation during the safety drills and how the personnel followed the safety documentation and incident reporting instructions. The results gained from the observations are included in their respective places in the following chapters.

5.1 In the beginning

Masters

According to the masters that participated in the interviews, no actual education on the ISM Code or safety management was provided to them. They described that education on the requirements of the ISM Code was gathered through practical work as they had participated in the forming of the system from the ship's point of view. Some masters

had also participated in the writing of documents for the safety management system. Some of the masters had worked as practical experts, and in this expert role they had made comments on the documents written in the shipping company. Some of the interviewed masters told that they had educated themselves on the safety management system as they were preparing for the first audits that were internal audits. Later on, the external audits were performed by the maritime inspectors of the FMA. Based on those external audits, the ISM certificates were acquired.

Some masters said that they had received outside education from a classification society such as Lloyds. In addition, some masters remembered that they had received some sort of a course but they could not recall the name of the course or the provider of the course. In addition, FMA gave advice and instructions on the application of the ISM Code in the beginning. According to one master, there were no courses on the ISM Code and there still are not any for the people in maritime occupations.

One master summarized the atmosphere of the early phase as follows:

> *"at that time, it felt like safety management and the ISM Code were new to all and the shipping companies, classification societies and authorities alike were seeking for the right way to apply it. And at that time, no one actually knew to yearn for education."*

Those interviewees, who had participated in the forming of the system i.e. participated in the description of the procedures and documentation, felt that they were forming the system for themselves and their own use. According to them, that is the way that it should be and those who are to use the system and who have to live with it should also build the system. One of the respondents actually saw it as an obligation:

> *"you make yourself a tool, so you have to make it yourself."*

The masters of one shipping company said that they acquired their first safety management system ready-made, by purchase. According to them, that system was originally made for a larger shipping company and it was not at all suitable for their operations. The purchased system included an unnecessarily large amount of documents and it was way too meticulous. The masters were later allowed to participate in the

development of the next version of the system, after which it became, in their opinion, more rational as a whole and more useful.

Masters from two other shipping companies also saw that a purchased system was a bad solution. They thought that off-the-shelf systems include masses of material that, in the end, no one reads in practice. According to one master, the aim should be to form a reasonably sized system and *"common seaman sense"* should be used in forming the system. According to another master, the aim of the system was to be a simple, realistic documentation and it should only describe the actual functions and operations of the ship at that time.

According to the masters, the amount of documents in the system is not important, but the fact that the system is formed based on their own experiences and that they can participate in the development of the system themselves is important. In their opinion, the system would then be more likely to be applied in practice rather than left *"dusting on the shelf"*.

According to the masters, nowadays education on the safety management system is given during the orientation as a new person comes on board. Usually, the closest supervisor is responsible for the orientation of the person, but, in some cases, the mate that is responsible of the maintenance of the safety management system is responsible for the safety management system orientation.

Deck officers

Deck officers who had worked in the maritime sector during the introduction of the ISM Code said that they barely received any education on the ISM Code and safety management. One mate told that the files merely came into use and it was assumed that everyone would read them. Correspondingly, one mate told that he had participated in an ISM Code related course, but his experience in the course was poor. According to him, the lecturers had repeated the same issues from lecture to lecture.

The younger mates, who had entered into the maritime sector after the introduction of the ISM Code, said that they received safety management education already in school.

According to the respondents, the ISM Code and safety management were referred to in several study subjects.

Several mates described that only practical work has taught them what safety management really is. This has come to pass through orientation from older employees and by practically performing the tasks they had studied from the safety management system. According to one respondent:

> "*at school you are still such a novice that you do not correctly understand the practical connections, to which the ISM Code relates"*

In addition, according to him, only the orientation on board and practical work can teach you proper safety management.

According to the mates, the shipping companies had not provided them with actual education during the employment. As they arrived to the ship as new employees, someone, usually a mate, had given them an orientation on the ship's safety management system. But there had been no separate education provided by the shipping company.

For some of the younger seafarers, the ISM Code is, according to them, a self-evident tool among other tools, because it has been a part of their career since school.

Some of the mates told that they had been able to participate in the forming of the safety management system themselves and, according to them, other staff members could participate too. According to some of the interviewees, the involvement of staff members is important, because, in their opinion, that results in a rational and clear safety management system. This keeps the system *"readable".* One mate was pleased that he had been able to have an influence on the description of his own tasks.

One mate told about a common early attitude. According to him, many people were wondering about the usefulness of the forming of a system in general:

> *"why do you have to put the simple things on paper, when we could have acted the same way as we have acted before"*

According to the mates, not all of them took part in the forming of the system. Some of the mates told that systems that were pre-made onshore were delivered to the ships, after which they were advised to familiarize themselves with systems.

Engineering officers

Several engineering officers, who took part in the interviews, had been involved in the forming of the safety management system in the introduction period of the ISM Code. The engineering officers highlighted the fact that the instructions of the safety management system should be written pragmatically and unnecessarily meticulous instructions should be avoided. One engineering officer summarized the idea as follows: it should include the "must be" not the "nice to be" features. Those who had participated in the writing said that the aim was to create as simple a description as possible on the existing practices - in other words, the aim was to write down things as they have been done in reality, because all that is written down must also be done.

Crew members

The crew members were not a part of the writing job or, as two of the interviewed crew members said, they do not remember being a part of the writing job.

The crew members did not recall receiving any actual ISM Code or safety management system education, but they did participate in all kinds of trainings, such as lifeboat training and fire drills.

Hotel and catering staff

On passenger ships, also the hotel and catering staff of the catering department were interviewed. In the safety management system, their responsibility is defined to be evacuating the passengers from the ship's facilities during an emergency situation. Therefore everyone, who has been assigned a task in the ship's alarm list, must have completed the STCW[8] Basic Safety Training course. The company has offered many of

[8] The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers

the respondents a Basic Safety Training course, since it became mandatory by STCW. In addition, the personnel from the catering department mentioned that they participate in safety trainings that are organized on ships regularly. From the viewpoint of their work, specifically those safety trainings are the most visible part of the ISM Code and safety management.

According to one respondent, the actual education regarding the introduction of the safety management system was scarce as they were merely advised to read the files. One respondent recalled that, at the early stage, there was an introductory lecture on the subject of safety management.

After the initialization period, their safety management education has depended on the weekly emergency trainings. The purpose of the weekly training is to create routines so that the personnel can act efficiently during an emergency situation. One of the respondents emphasized that safety management education has depended on lifeboat training only. Some of the personnel of the catering department said that education on safety management systems has been very cursory or it has not been issued at all.

Some of the respondents from the catering department criticized emergency training for not being developed further. In their opinion, new training methods could get the personnel more excited about training. Occasionally, training is considered forced, since, according to the respondent, there has been too much repetition of the old. Training should be renewed once in a while and made more versatile. In addition, the respondents wished for more thorough debriefings after the training, during which the course of the training and what should be learned from it could be reviewed in more detail.

According to the respondents from the catering department, new employees are briefed on safety management during their orientation. The orientation is given by their own supervisor or a so called safety mate.

Management

The management representatives (DPA's, CEO's and other management) recalled that they had at some point participated in actual ISM Code related courses. Those courses were organized by classification societies both in Finland and abroad. In addition, several management representatives had taken part in safety seminars and conferences. Some had also received education on the ISM Code while studying to become captains.

According to management, the ISM Code based safety management systems were formed in the introduction phase in cooperation with the ships' personnel, so that under the leadership of the DPA, the ships' masters, mates and engineering officers had made documents or at least commented on them. One of the interviewed safety managers noted that the employees feel as if the system is their own if they get the opportunity to influence it by commenting on it or even writing parts of the system. According to the interviewed DPA's, they wrote the systems for the most part on their own, without the help of outside consultants. Some of the respondents told that they received guidance and advice on applying the ISM Code from the FMA or a classification society. The writing of the system was mostly done expressly by the DPA's.

According to the interviewed management representatives, in the early stage, the ISM Code and safety management faced opposition. They had been inquired whether the professional skills of the employees are no longer trusted, since the most simple things must be written on paper. According to one of the interviewees, this kind of opposition still exists and the ISM Code is considered to be pointless.

According to one DPA, in their shipping company, the ship's personnel hardly took part in forming the safety management system. He told that the ship's masters had participated, but other members of the personnel had not. The introduction of the system was completed rather quickly and, according to him, the whole safety management was considered to be very formal. The DPA told that the system turned out to be unpractical. The operation on the ship did not correspond with what had been promised in the manual. According to him, the instructions of the safety management system were not followed in practice, for example when changing work shifts or in waste oil handling. According to him, the instructions of the safety management system and practice are

still not corresponding and, as such, the situation is still the same as it was right after the introduction of the ISM Code.

Maritime inspectors

Most of the maritime inspectors who took part in the interviews had worked on ships during the introduction of the ISM Code. They had become maritime inspectors only after the ISM Code had come to force. Usually they had worked as mates, first mates or masters during the introduction of the ISM Code. According to the respondents, hardly any orientation or education was given at that time. Some of the interviewees were told to just read the manuals. According to the respondents, the shipping companies should have been much more active in orientation during the initial phase. Some criticized the shipping companies for aiming only at fulfilling the requirements of the authorities, getting through the ISM audits and gaining the ISM Code required certificates for the ships. According to the respondents, nothing actually changed in practice.

One of the respondents had experience from a foreign shipping company, in which he had been provided a thorough orientation to safety management. His closest supervisor had been responsible for the orientation and had made sure that the employee carefully examined the instructions of the safety management system and had even made some questions about the safety management system to the interviewee.

Some maritime inspectors told that, in their shipping company of that time, someone from the onshore personnel had been responsible for building the system, for example, the company lawyer. They also told that, in the initial phase, the ship's personnel did not participate in writing the system. In those cases, the system had become too complex and unpractical.

According to one inspector, it became hard to maintain the system, since the system included too many check lists and there had been too much paperwork. Another maritime inspector said that, in the initial phase, the ISM Code was considered an extra burden that only caused excess workload, especially during the introduction period of the system and, on the other hand, excess reporting during the application of the system. According to them, those are the reasons why the ISM Code faced so much opposition.

According to one maritime inspector, the safety management systems should be made on one's own so that the manuals are suited for one's own needs. As a negative example, he mentioned that even today, you can run into shipping companies in which the safety management systems are made by a consultant, which means there is no relation between the system manuals and reality. The manual is not necessarily even linked to the shipping company in any way. According to him, this is absolutely the wrong approach.

5.2 Management commitment

The representatives of the personnel (masters, deck officers, engineering officers, crew members and hotel and catering staff) and the maritime inspectors were asked how the management supports the personnel in safety issues and how the management gives feedback and communicates 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 representatives of the management were asked about the company's safety policies, safety goals and other aspects that contribute to the companies' safety issues.

Masters

According to the interviewed masters, one of the most significant effects of the ISM Code has been that the company and its management have been assigned particular responsibilities for ensuring safety. According to the interviewees, the managements' attitudes towards safety are continuously improving. According to some masters, safety has an important role in their company even because of the economic profitability. These attitudes are particularly visible in passenger shipping companies. According to one master, they must be able to present an image of safety to the customers i.e. the passengers. It would be even better if the image would be based on reality. According to some masters, the attitudes towards safety management in their company management are very positive and they support the application of the system.

The interviewed masters felt that well-reasoned investment suggestions aimed at improving safety can usually be easily accepted by the shipping companies. Some masters said that, in their company, they have invested in safety education accordingly. Especially work safety is invested in. The interviewed masters were of the opinion that true management commitment is best manifested in practical actions rather than in orations. In the interviewees' opinion, the companies have to spend money in safety investments and in continuing education of the personnel.

One master said that he does not see conflicts between the company management's actions and the promises they have given. In that sense, he describes his company as a responsible operator. Yet, since he has worked in the field for a long time, he has noted that, in some shipping companies, there are contradictions between talk and action. Especially in economically challenging times, he has heard that safety related expenses are easily cut back on.

According to some masters, some shipping companies might even go too far in their safety goals. They aim for something that cannot be achieved.

One interviewed master noted that the company management's actions have not always been without contradiction. According to him, they write "beautiful statements" to the system and give the personnel speeches emphasizing safety, but those are not always realized in practice. He told that they have not always received the required resources or enough education.

"Money means: always think on the economic aspects"

According to another master, it is always easier to achieve changes in safety management if they only require the change of practices and updating the related instructions. Making safety improvements that require monetary investments is more difficult. For example, in you have to fix or update equipment, getting the funding from the company can be more difficult.

"Management gives support well enough, but, in contrast money…"

The interviewed masters told that management commitment can be seen in how well they provide feedback and information when needed. According to some of the respondents, they continuously get information from "the office" of their shipping company. In some shipping companies, the management representatives visit the ships regularly to give feedback. For some masters it is important, that the company management understand seafaring.

On the contrary, some masters were disappointed in the management's attitude towards safety, because the management has not given feedback related to safety and has not communicated actively. One master wished for more feedback and contribution from the office. He suspected that, with regard to safety management, an active person can be even considered difficult. According to him, things are in a bad state and sometimes the office may not respond to some issues at all.

Deck officers

According to some deck officers, their shipping companies provide enough support in safety matters. Some deck officers felt that their company takes safety issues seriously, which is manifested in, for example, the fact that money has been allocated to necessary investments. One deck officer highlighted that everything they have needed, they have been able to get through the shipping company.

In contrast, some deck officers experienced that the concrete support from management has been incomplete. According to one deck officer, the management talks about supporting safety management, but in practice, management has taken away the possibility to improve safety by reducing the budget and resources. According to another deck officer, their safety manager has been deprived of his influence in the organisation as he is not given the necessary economical resources. One deck officer noted that one person, i.e. the DPA alone, in a safety organisation is not enough to take care of all the issues related to safety management.

One deck officer said that they had received a deviation remark from an external auditor due to of insufficient management commitment. According to him, the situation has not in fact improved after that either. Even afterwards, they did not receive more resources to manage safety issues, even though the safety management system documents were altered. According to the interviewee, this shows that the shipping company management is interested in safety management only to the extent that the audits are passed and the certificates are maintained. According to one deck officer, the company management cannot know and is incapable of observing the ships' genuine needs regarding safety.

One respondent felt that the ships have neglected the development of safety management systems, since the ships don't have the necessary human resources. In his opinion, for that reason, continuous improvement does not occur and no one is developing the ship's system.

The interviewed deck officers told that they were rarely or never in direct contact with the onshore organisation. They also said that the top management of the shipping company is barely visible at all on the ships. According to the deck officers, communication regarding safety occurs with the safety organisation and especially with the DPA. Few deck officers were in contact with the onshore organisation themselves. According to them, the ship's master and, in some cases, the chief mate take care of the safety related communication ashore.

According to one deck officer, there is no need for the company management to be visible on the ship as such. It is enough that the shipping company's DPA is visible and active.

Many of the interviewed deck officers felt that their shipping company DPA's operation was good. They told that the DPA provides them with instructions and feedback if necessary. Some deck officers told that the DPA has visited on board and talked to them and the DPA has been visible. According to one respondent, in "the office", safety is personified by the safety manager, who, according to him, keeps in contact excellently.

One deck officer from another shipping company went on to tell that their DPA was visible and responsive and gathers information from the ships and passes it forward. One deck officer wished that the DPA would have enough support from the shipping company. Correspondingly, another respondent wished for strength to the DPA.

Respectively, another deck officer saw it as a deficiency that their management does not have an adequate profile on safety and does not visit the ships. In his opinion, the company management could, for example, organize annual safety events for its personnel. According to him:

> *"The cooperation between the ship and the office does not work as required in the safety manuals. Inside the ship the system works better than in the office. The management boards operate on board, but you don't get any feedback from onshore. The channel of influence is rather direct phone calls."*

If the deck officers were asked about management commitment, they usually brought up the cooperation with the ship's master themselves. Most of the deck officers thought that cooperation with the ship's masters went well. The deck officers told that, inside the ships, communication works well with the ship's captain.

> *"Working together with the masters is the best. You do teamwork. The close teamwork spirit exists also on the company's other ships. Cooperation within the ship works well"*

> *"Here we have a low threshold for contacting the master if needed. But it does not rule out that the master has the necessary authority. The master here is visible in contrast to cargo ships where the masters usually retreat to their own cabins"*

> *"This ship has great masters. Changing the master does not have an influence on safety"*

Engineering officers

According to some representatives of the engineering officers, their shipping company's management is highly committed to safety. One respondent emphasized that:

> *"the company management stands behind the words"*

According to the respondent, this is manifested in the fact that suggestions of improvement that are aimed at improving safety have been approved. He also added that it should be noted that good supporting arguments are always required for new investments and acquisitions.

In contrast, according to one engineering officer, the management is committed only as long as it does not involve money. According to him, when things concern money, you can easily get walked over. Safety is an issue only for reasons of image. Nevertheless, the business goes ahead and safety is not priority number one.

The representatives of the engineering officers felt that safety issues are personified by the company's safety manager (DPA). According to one respondent, the DPA operates as the management's mouthpiece and, according to another respondent, their DPA is active, but the company management is not visible on the ships. In his opinion, it is not even necessary for the management to be visible, as long as the DPA has the necessary resources.

Crew members

The crew members that participated in the interviews said that their shipping companies invest in safety. They also get support from the top management. According to them, it is possible to be granted money for improvements and especially for well-reasoned investments. One crew member thought that the company invests in safety in non-financial ways as well. According to one respondent:

"*the whole corporation is in favour of safety."*

The crew members' experience was that the shipping company's top management is not visible on ships and it does not communicate about safety in a way in which the message is visible for the crew members. Instead, the safety issues are informed to the crew members through the ship's master. According to some of the crew members, the masters communicate well on the safety issues and nowadays communication with the master is not stiff, but appropriate in a casual manner.

Hotel and catering staff

According to some of the respondents working in the catering department, their shipping companies' attitudes towards safety are good and proper. Those respondents said that in their shipping companies:

"money is not an issue when it is a matter of safety."

Some respondents mentioned that especially the shipping company's DPA provides support and listens to thoughts and suggestions. According to one respondent, as a rule, all suggestions for improvements are accepted by the company.

In contrast, some respondents felt that sometimes suggestions for improvements are rejected based on too high expenses of the investment.

According to the members of the catering department, on the ships, the safety issues are usually handled with the masters and, in some cases, with the officers. In contrast, the shipping company management is not visible on ships.

The members of the catering department told that, on their ships, the masters listen to them when it comes to safety, and take the safety issues seriously. According to them, suggestions for improvements are also well received. Some respondents found the masters easy to approach. As a concrete example, everyone eats in the same space in the shared mess room, which makes it easy to bring up issues with the master. According to some respondents, you can get proper answers from other officers also. Most of the respondents saw that communication with the master and other officers is easy and people are not afraid to talk about anything.

Management

The group of management representatives included eight people working as safety managers (DPA) or in corresponding positions. Their answers establish how the company management working above them feels about safety management. Six of the respondents worked as CEO's or in corresponding positions (top management) during

the interviews, thus, they had the authority to make decisions concerning safety related economical investments and resources.

According to some safety managers, the company management above them takes safety issues seriously and the management's attitudes have changed for better after the introduction of the ISM Code. In their opinion, the company management has made sure that safety work has enough financial support and human resources. One safety manager said that they have a safety concerned management that does not compromise on safety but at the same time tries to keep the safety expenses at a reasonable level. Another safety manager told the interviewer that you also have to provide good arguments for the safety investments to the shipping company management so that they approve the investment.

One respondent stated:

> *"My shipping company has realized that safety is a part of productivity and profitability. And an accident would simply cost too much"*

According to the safety managers, the company management should be more visible and it should be heard promoting safety work on the ships. In some shipping companies, the top management makes regular visits to ships, during which one important topic is to discuss safety issue with the ship's personnel. These visits are also made during the ISM audits on ships, which the respondents see as a manifestation on how seriously the management takes the audits and safety management in general. In some shipping companies the management's visits are documented.

Some safety managers said that their shipping company organizes a "crew meeting" one to two times per year, in which also safety and safety management issues are discussed. In these meetings the company top management communicates about safety.

According to some safety managers, their company's management does not have onboard maritime experience. They feel that this somewhat impedes the safety work and is manifested in the fact that such a management is inclined to skimp on safety

investments. According to one safety manager, his supervisor has a background in seafaring and thus he clearly understands the importance of safety.

According to one safety manager, their top management is more words than action. This is manifested in the fact that sometimes not even the most relevant improvements are carried out on the grounds of the lack of money. He also sees that there is a lack of human resources that impedes the proper fulfilling of the safety tasks.

The representatives of the top management assured that their companies take safety and environmental issues seriously. Some of them felt that safety oriented operations were an integral part of their business and that safety was a precondition for profitable business. The managers cited some practical examples of how they have supported and encouraged the maritime personnel in safe operation. According to them, the management can demonstrate their support by communication, by visiting onboard, by participating in ISM audits, by giving feedback and by reacting to any nonconformities and safety initiatives.

Maritime inspectors

The interviewed maritime inspectors described that, especially in the larger Finnish shipping companies that operate in international traffic, the attitude towards the ISM Code based safety management is positive. According to them, those shipping companies feel that they gain concrete benefits from the safety management system. One of these benefits can be, for example, economic benefit in the form of savings in repair costs as the service and maintenance of the ship is performed more systematically. According to one respondent, several shipping companies would keep the safety management system even if it would not be mandatory anymore. One maritime inspector even sees that the biggest changes have occurred in the shipping companies' management, as the ISM Code has required that also the top management takes responsibility for safety. According to him, this is the case most of the time as well.

Some maritime inspectors said that even though the economic factors are still crucial in shipping companies, sensible suggestions for the improvement of safety are well accepted in shipping companies. No conflicts regarding occurrences in which important safety investments have not been allocated money and resources have emerged during the audits the interviewees have performed.

In contrast, the interviewed maritime inspectors told that small shipping companies that operate in domestic traffic don't really understand the meaning of the safety management system. According to the maritime inspectors, in these shipping companies, rather strong opposition towards the extra bureaucracy caused by the systems has occurred.

5.3 Employee participation

Masters

The masters that participated in the interviews told the interviewer that nowadays the personnel are quite active when it comes to safety. According to them, the employees participate in, for example, trainings very well. Several personnel members also make safety related initiatives and suggestions for improvement. One master particularly praised the younger generation of seafarers, who have gained a basic knowledge of the ISM Code and safety management while studying the profession. In contrast, he stated that the older crew members have usually had a negative attitude towards the requirements of the ISM Code. They have felt that their skills and experience are not appreciated and their seamanship is not trusted.

The masters were of the opinion that the personnel are not afraid to come and talk about safety related issues and they are not bashful with the masters. According to some masters, nowadays the discussion with the crew members is straightforward. One master saw that straightforward discussion has had a great influence on how good the ship's spirit and atmosphere are, which in turn has a direct effect on the personnel's safety behaviour.

Some masters commented on the beginning of their own seafarer careers, during which you barely dared to speak to the captain. One master told that, in the old times, if you were forced to confront the captain, it was because you were criticized or punished for some error. According to him, such behaviour rarely occurs anymore. According to another master, the fact that nowadays the ship's personnel have common rooms has affected the current more open communication culture. For example, everyone eats in a common mess room.

Deck officers

According to the deck officers, the personnel motivations regarding safety are fine. They thought that this is manifested in, for example, how eagerly they participate in safety trainings. According to one deck officer, all crew members on his ship are eager to take part in drills. One deck officer told that, on his ship, the personnel are interested in safety. According to him, they find out about the issues independently and spontaneously and also inquire the officers or the master if needed. According to one deck officer, there is a constant hurry on the ships, but nevertheless, safety and safety management are taken seriously. According to him, the crew members' attitudes are good as a whole.

One deck officer told that some members of the personnel are especially active. According to him, those are usually the same people that also participate in the trainings actively. He saw that the attitudes depend on the person and some people have a more progressive attitude.

One respondent felt that especially the older people have not been able to be persuaded to adopt a positive attitude towards continuous improvement. These people have such an approach that only when something gets broken they react. Also another deck officer saw that the older crew members had a somewhat worse attitude towards safety management. In addition, he saw that some people still do not completely understand the meaning of training. He suspected that this could also result from the fact that the drills are too repetitive. According to him, training motivation could possibly be improved by conducting drills that are diverse in content. He also suspected that many

people have to participate in training during off-watch too often, which can in time become burdensome.

The deck officers commented on the ships' atmosphere both from their own point of view as well as from their subordinate's point of view. According to the deck officers, they have such masters that they themselves have the courage to discuss about safety matters with them and they are glad to do that. The deck officers told that they have not witnessed that other crew members are shy either, when it comes to discussing with the master and other officers. According to the deck officers, in todays' ships there is definitely an atmosphere of open discussion. According to the respondents, the current members of personnel want to know things and are not afraid to ask their supervisors and masters about all things related to safety. According to one deck officer, this is influenced by the fact that nowadays needless hierarchy no longer exists among the personnel. According to another respondent, you cannot afford to have a strict hierarchy, since the number of personnel is rather small and in a small group you have to work as a team. One deck officer told that, also on their ship, the personnel form a rather small group, in which the communication works well. According to one respondent, communication is not a problem at least on Finnish ships in general.

According to one deck officer, a Finnish seaman wants to think with his own brain. Some kind of counselling is still required so that a mutual understanding can be achieved. According to him, it is important to find a mutual understanding on things rather than blindly follow orders. He then added that the chain of command from the master downward is still formed whenever necessary and in that sense the masters' authority is not questioned.

Some deck officers felt that the exchange of safety related information between the different ships of the fleet of the shipping company does not work properly. According to them, more information should be exchanged about, for example, deviations, so that they would not end up reinventing the wheel. One respondent suspected that the personnel feel ashamed if something has happened on the ship and they do not want it to reach a wider knowledge. According to him, the outdated attitude and negative stand

on declaring errors and learning from them hinders the everyday work. According to him, there is a possibility that something worse might happen.

In the opinion of one respondent, there is plenty of communication on board their ship. There is also communication from on board to shore, but, according to him, it seldom leads to any action. According to him, the feedback system does not function well. The respondent saw that the personnel have a positive attitude towards continuous improvement. The personnel would like to improve safety, but the shipping company management does not note it properly.

According to one respondent, the communication works well on board and on board they discuss issues that lead to improvements on the ship. Yet, reports are made only if the issues cannot be fixed through conversations and through the ship's own actions. According to one deck officer, the ships' personnel approve the requirements of the current safety management systems well, but the threshold for reporting is high, since it usually causes a lot of extra work. According to him, this is because the reporting practices are unnecessarily burdensome.

Engineering officers

The representatives of the engineering officers that took part in the interviews saw that no opposition regarding safety management appeared amongst the personnel. One engineering officer saw that the personnel take safety into consideration well, at least with regard to their own work. He told that this is manifested in, for example, how well the personal safety equipment is used nowadays. One engineering officer saw that, on his ship there is no grousing and the participation in trainings is well motivated and done responsibly. According to one engineering officer, the attitude towards continuous improvement is in shape and the goal is to fix the problems as they appear instead of fixing them only after something gets broken. Another engineering officer told that if something deviant is observed, they aim to fix it.

According to some engineering officers, young seafarers do not always notice and care about safety issues. One of them saw that this is because the young seafarers think that

nothing can happen to them. Another respondent saw that the young seafarers have a wrong attitude as they enter into the seafaring occupation. According to him, they do not have a true motivation to become seafarers as they enter into the field and they enter the maritime school only because they happened to get in.

According to the engineering officers, the communications on the ships works well. They said that the members of the personnel are not afraid to speak up and talk about safety related issues. On the ships, the personnel are thanked if it is noticed that something good has been achieved.

One engineering officer told that, on the ship, you are in a small group that works together and spends free time together in the common mess room. According to him, no groupings are formed in the small group on board and the communication is open between everyone:

> *"You can also easily talk to the skipper as everyone eats in the common mess room "*.

Crew members

According to the interviewed crew members, no wide opposition to safety management exists among them. The crew members said that, from their point of view, safety management mainly consist of the trainings. According to them, the participation in the trainings is quite commendable. In addition, according to them, the personnel are active enough, when it comes to safety issues. One respondent saw that the activity is manifested in the fact that initiatives are made on the ship whenever necessary. According to one crew member, the resistance to change has declined and the personnel take part, for example, by giving feedback. According to one crew member, some of the people on board are well involved, yet still some of the people oppose the ISM Code strongly.

According to the interviewed crew members, usually everyone dares to open their mouths and talk about safety issues on board. According to one respondent, they are not afraid to bring out problems and talk about them with their supervisors.

According to the crew members, the communication with the shipping company is executed through the chief engineer or the ship's master. There are practically no direct contacts with, for example, the DPA. One crew member told that recently the communication has begun to work with the shipping company also.

According to one respondent, some of the ship's officers are indifferent to hear the problems of the personnel. Another respondent told that the communication on board the ship works, but for some reason the information does not go forward to the shipping company through the ship's master or the chief engineer.

One crew member felt that the amount of personnel on board has decreased considerably and the ships sail with very small crews. According to him, the amount of personnel might be too small in the case of an emergency.

Hotel and catering staff

Some of the members of the catering department told that personnel attitudes towards safety are responsible and serious. According to one respondent, the personnel have everything under control and she feels safe altogether on board with her colleagues. According to another respondent, the members of the personnel perceive the meaning of safety and have a positive attitude towards, for example training. One respondent saw that the personnel on board are motivated, which, in his opinion, is manifested in, for example, participation in evacuation training.

According to some respondents of the catering department, the communication on board works well. They said that, on board, you can talk with supervisors and the master about anything, face to face. One respondent mentioned that he himself has the courage to talk to his supervisor and he feels that his subordinates have the courage to talk to him. He emphasized that he prefers that they come and speak to him especially about safety issues. Another respondent felt that on her ship you can safely discuss issues and, according to her, the personnel feel like you always dare to ask. One respondent said that on his ship, the discussion is open and it is possible to talk about anything with the

company management also, whenever they visit the ship. According to one respondent, those who have been on board for a shorter time don't yet have the courage to speak up.

According to one respondent, the hierarchy functions appropriately on board. He told that the master is always the master, even though in everyday life the work might be done quite informally. He told that the masters do not needlessly stress the hierarchy either. Some members of the catering department described that the master is often seen in the common mess room and he often comes to dine at the same table. According to them, this lowers the unnecessary barriers between supervisors and subordinates significantly.

According to one respondent, the human relations and communication work well on her ship. She told that everyone can even go and talk directly to *"the skipper"*. According to her, the master has authority that comes with professional skills but this sort of authority does not come by commanding - it comes from the masters being skilled. She compared this to her previous experience in another shipping company, in which she did not have the courage to speak directly to the master. According to her, that shipping company was strict, when it came to hierarchy.

According to one respondent, the problems of safety management do not exist in the ship's inner communication or attitudes, but rather in between the ship and the office. Another respondent said that the ship sends messages ashore, but the problem might be in passing the message back. One respondent hoped that the shipping company would arrange more information exchange between the different ships of the company. According to him, better information exchange between ships would allow them to learn from each other.

One respondent brought up the amount of crew members on board. According to him, it is relied too much on that such a small personnel amount could operate during an emergency situation. In addition, he pointed out that crew turnover is high, which results in the fact that not all personnel have adopted *"all the safety stuff"*.

Management

According to one management representative, the personnel attitudes have gotten better with time and the personnel take part in safety work better and better. He emphasized that especially the younger generation that has come on board after the introduction of the ISM Code is satisfied with safety management and, according to him, the younger generation also functions more systematically i.e. they follow the principles of safety management more conscientiously.

The safety managers said that the ships' personnel rarely take direct contact with them in issues regarding safety. According to one safety manager, the members of personnel do not give enough feedback on safety issues. He says that this is manifested in, for example, the fact that deviations are not reported. He suspected that perhaps the employees are afraid that they would get the blame if they report issues. He added that the personnel are shy when it comes to giving feedback. According to him, the personnel apparently do not see the benefit of reporting and development, even though the system is created for them and for their own safety. According to him, initiative attitudes have decreased.

According to another safety manager, the members of personnel are also allowed to call or send e-mail when they know the respondent i.e., for example, the shipping company's safety manager.

According to the management representatives, the ships' personnel are not afraid to bring up the difficult topics as well. One respondent saw that the personnel have the will to communicate. Another respondent characterized the communication between the ship and the shipping company as open, but specified that the information mainly comes through the ships' masters. According to him, the personnel are seldom in direct contact. Nevertheless, when he enters the ship, the personnel dare to talk to him freely. He emphasized that

"in order to know what is going on, you have to go on board."

According to one safety manager, safety might be too personified on the ships. If safety is a part of the employee's job role, such as it is with the "safety mate", the employee has initiative when it comes to safety. According to him, other employees unfortunately have less initiative on the matter.

One management representative saw that in their shipping company there are a lot of long term personnel who know the company's policies and the company management well. According to him, for them it is easy to communicate with the company management and, correspondingly, it is easy for him to communicate in the direction of the personnel.

According to one safety manager, the personnel initiatives have decreased from the time when safety management was introduced. According to him, the personnel in their shipping company no longer make suggestions on improving safety and no longer report on deviations sufficiently.

According to one safety manager, the fact that the ships have a common mess room where everyone meets each other enhances the ships' internal atmosphere of discussion.

Maritime inspectors

According to some maritime inspectors, the ships' crews are starting to find the right attitude towards safety management. According to one respondent, safety management is in a good condition at *"the grass-roots"* level of shipping. According to another respondent, nowadays the crew knows what safety management means. According to some maritime inspectors, the introduction of the ISM Code is already so advanced that safety is considered a positive thing.

"The crew is positive towards safety management"

According to one respondent, nowadays safety management is considered to be normal operation. He sees that the familiarization with safety management by the personnel is better nowadays and the level of safety management has increased significantly since the early stages of the ISM Code. According to another respondent, in the beginning, the personnel had a negative attitude towards safety management, but nowadays many

have realised that safety management brings benefits as the organisation and division of work are clearer and the roles and responsibilities are clearly described. One respondent told that the crew members are aware of their own tasks and roles. According to him, the crew participates well in trainings and they are motivated when they know their own job and role. One maritime inspector said that he had observed that the personnel attitudes depend on what kind of a safety management system has been created. According to him, documentation that is too complicated and, for example, an excessive amount of checklists can cause negative attitudes. He added that the attitudes are positive if the reporting has remained at a reasonable level.

According to one respondent, the personnel initiative did not necessarily come across during the introduction of the ISM Code but later the attitudes changed. He suspected that, in the beginning, the requirements of safety management were considered to be a nuisance forced on them by the authorities. Nowadays the perception is more positive, which, according to the respondent, is partly due to the fact that the training is more diverse. According to him, before the introduction of the ISM Code, not much attention was given to what is trained and why. This has changed with the introduction of the ISM Code. Compulsion has come along, so that all crew members have to take part in training. Earlier the contents of the trainings were not paid attention to and trainings were always done in the same formula, which, according to him, led to bad motivation.

According to one maritime inspector, nowadays the personnel take safety management seriously. He thinks that the accident of the Estonia contributed to the fact that nowadays the personnel act more thoughtfully and take safety more seriously.

According to one maritime inspector, the shipping industry has traditionally been very hierarchic. He thinks that nowadays hierarchy does not exist, which can be seen in the fact that communication is open and easy. He told that the master can talk directly to the crew and vice versa. This is due to, for example, everyone sitting in the same mess room. According to some maritime inspectors, nowadays the personnel dare to speak up. For example, everyone dares to speak to anyone in the common mess room. They consider openness to be the present-day way.

According to one maritime inspector, the personnel communicate poorly about safety. He thinks that very few of the members of the personnel know, for example, how to bring about change. He sees that the share of the crew members and also the share of the officers that have a good level of knowledge remains quite small. According to him, there should be more courage to talk about things. According to another maritime inspector, the personnel are not willing to put things on paper and, on the other hand, their message does not reach the "office". One maritime inspector claimed that the personnel are not active to discuss about safety and make initiatives if their former messages have not been noted by the shipping company. According to him, in good shipping companies the office personnel visit the ships regularly and during those visits they discuss with the crew, which makes the personnel more active when it comes to safety.

According to one maritime inspector, the personnel attitudes have changed a lot, since nowadays the personnel's views on safety are better heard. According to him, the experienced seafarers were superseded earlier and their opinions were not heard during the construction of the first systems. Now that the seafarers have been allowed to participate in the developing and correcting of the safety management system, their attitudes have become significantly more positive and they are more willing to take a stand on safety issues than before.

Observations

Communication on-board was observed by focusing on how the personnel communicated with each other and with their superiors. The interviews indicated that the atmosphere on board the ships is open and easy for communication and non-hierarchical among the personnel. This indication got support from the observations done while the researcher visited the ships. It was often noted that the personnel approached the master and other officers by discussing informally. It was apparent that the shared mess room for coffee and lunch breaks facilitated the launching of those informal discussions. The personnel kept company with each other despite their rank. Also the ship masters often launched informal discussions during breaks.

In addition, the indication of a non-hierarchical atmosphere on the ships was supported by the fact that the masters and the officers took part in the daily operations when necessary. On one passenger ship, for instance, the master was observed participating in carrying the passengers' luggage. However, he was dressed in a crew member's t-shirt and thus the passengers did not distinguish him from the other crew members. This occurrence might be the most extreme encountered example of a contemporary non-hierarchical organisation. Nevertheless, the personnel of that particular ship assured that the ship master has the necessary authority and respect.

The issue of open communication emerged also during the audits. The auditors asked the personnel whether they have any problems or concerns they would like to discuss about. It was noted that the personnel were encouraged to discuss freely with the auditors, yet they did not dare to highlight problems and faults to the auditors. In addition, the observations indicated that the personnel were active in making safety proposals and questions to the auditors and those representatives of management who participated in the audits on behalf of the company.

During the audits, special attention was paid to the safety drills. Every audit session ended with a safety drill. There was a collision exercise on M/S Finnhansa. The exercises on M/S Finnmaid, M/S Finnstar and M/S Kristina Brahe were focused on the evacuation of the passengers of the ship in case of an emergency. During the audit on M/V Seagard, the crew exercised firefighting. In addition, there was an evacuation exercise for passenger and a lifeboat exercises for the ship's crew on M/S Kristina Regina. The evacuation exercise was obligatory for all passengers. The purpose of the lifeboat exercise was to practise lowering the lifeboats into the water (see Figure 4, lowering the lifeboats on M/S Kristina Regina), test their functioning and practise their manoeuvring (see Figure 5, The crew of Kristina Regina testing the functioning of the lifeboats at the Red Sea). There was also a lifeboat exercise on M/S Kristina Brahe, which included the lowering and testing of the functioning of the lifeboats.

Figure 4. Lowering the lifeboats on M/S Kristina Regina (14.12.2008)

Figure 5.The crew of Kristina Regina testing the functioning of the lifeboats at the Red Sea (14.12.2008).

The observations of the safety drills supported the indications of the interviews that the personnel participated in the drills actively. It was found that the personnel participated noticeably actively and were devoted to the drills. All of the crew members were involved in the drills. Each crew member had a predefined role and responsibilities in case of an emergency. The observations indicated that each crew member was familiar with their responsibilities. It was found, for example, during the lifeboat exercises that each crew member had their own specific duties.

5.4 Benefits of the ISM Code

Masters

According to some masters that have been in the field for several decades, safety culture has clearly improved, so that nowadays the operation on the bridge is more team work and is based on a mutual trust between the personnel. According to them, professional skills are respected more on board. This makes it possible that even a young mate can intervene in, for instance, the master's mistakes or doings without being afraid. Some of them told that at the time when they came to the industry, such behaviour was unthinkable. One master told that when he started, the only time the captain had something to say was when he criticized or punished someone for making a mistake.

Another master had experience of situations with his own earlier masters, in which the masters had berated the mate's professional skills in public.

According to one master, the maritime field is so old and conservative that it has taken a long time to weed out the needless hierarchy and the work is still partially unfinished. For some time he had worked on board a ship that had a foreign master. On that ship, the hierarchy was strict and they did not have the courage to question the master's actions even if the master had taken risks.

Some masters told the interviewer that in the old times, people admired the experienced seafarers, who did dangerous things without safety equipment. They told that at the time, taking risks was acceptable and as a result accidents did happen. According to them, nowadays this kind of unnecessary risk-taking is not generally accepted. According to one respondent, occupational safety and health activities have weeded out this kind of behaviour.

One master saw that the introduction of the ISM Code did not cause major changes on those ships that were already *"good".* According to him, the ISM Code has made those, who invest less in safety, take care of things even a little, which has enhanced the overall safety.

According to some masters, the introduction of the ISM Code and the related safety management systems have brought a new kind of *"safety thinking"* on board. According to one master, the ISM Code is one of the few regulatory reforms that has actually brought added value to safe travelling. One master noted that nowadays the personnel are much more conscious and they, for example, take the training more seriously. According to him, the trainings are no longer considered futile and the personnel do not *"skip"* them. Another master saw that the personnel's enhanced *"safety attitude"* can be seen in, for example, participation in trainings. According to one master,

> *"nowadays the personnel act more professionally and they have a better basic knowledge and a better safety awareness".*

Some masters felt that the practices have been standardized and work has become more organized on different ships with the ISM Code. The ISM Code based safety management has brought systematization and orderliness to the training and familiarising of new personnel. According to one master, in the past for example lifeboat training was amateurish and unprofessional and arranged sporadically, but nowadays they are held regularly and they have a premeditated content. According to some masters, the systematic operation and standardisation of practices has succeeded due to the introduction of checklists. In their opinion, the checklists have brought systematisation and safety to routines, as things are no longer done from memory. According to some masters, the standardisation of practices makes it easier for people to move from one ship to another. According to one master, the systematisation is manifested in the clarification of the division of work and roles. He sees that this has enhanced the ship's inner cooperation with time. According to him,

"a culture of cooperation is developing on the ships."

According to some masters, the most significant benefit is that the up-to-date procedures can easily be found if necessary.

Some masters saw that the responsibility that the ISM Code imposes onto the company and the company management is one of the most significant improvements when it comes to safety. According to one master, the ISM Code "forces" the company to also take care of safety, and the company has to express its own determination regarding safety. Another master sees that, through the safety management system, the ship's personnel can affect the company management. One master told that the safety management system improves the flow of information between the ship and the shipping company. According to him, nowadays the information goes as far as to the shipping company's top management. According to one master, it is a good thing that the shipping company also has to bear legal responsibility and not just the ship's master.

Some masters told that investments on safety have been done in their shipping company. One master said that the shipping company *"invests in*" safety. According to

another master, their company has invested in safety equipment and training especially during the recent years. One master told that *"safety thinking"* has increased in their shipping company with the ISM Code. According to him, safety thinking is at a very high value in the shipping company management.

Some masters mentioned incident reporting and learning from them as one of the benefits of safety management. Some masters saw that with the ISM Code the company has to intervene and correct the possible safety deviations as they are recorded into the system. According to one master, now everyone has a chance to bring up deficiencies and make suggestions for improvements and get them to the attention of the company through incident reporting.

According to some masters, regular audits are useful, because with them, an outsider comes on board and looks at the ship and its operations with new eyes. According to one master, the internal and external audits actually monitor that the safety management systems function correctly.

Deck officers

According to the mates, one positive effect of the ISM Code in general is that the issues are now documented and they can be easily found. According to them, it is a good thing that there is only one *"tool"* in which you can find answers to all practical problems and you have a place where you can check out the unclear issues if necessary. According to one respondent, the answers can be easily found as long as the system does not include any vague *"nonsense"*. According to one respondent, the system includes all the things that you have to and need to pay attention to. Another respondent said it is a good thing that you do not have to "come up with" the right way to do things yourself, being able to simply check out the right procedure from the system. One deck officer told that you can also spread the procedures that have been proven to be good through the system into other ships also. According to another deck officer, with the safety management system it is possible to ensure that the developed good practices are maintained on the ship even though the personnel changes.

According to the deck officers, safety management systems have unified the procedures between ships and even between shipping companies. The respondents think that this makes it easier to orientate new employees and for personnel to transfer from one ship to another. According to them, it is easier to rationalize things to new employees, when you can rely on the safety management manual during the orientation or guidance. With the system, it is possible to give guidance on the company's way of actions in different situations to a new employee. According to one deck officer,

> *"safety management has clarified operations, which has made it easier to learn the job as the job no longer is merely the arcane science of old sea dogs".*

According to some deck officers, the safety management systems have clarified the roles on board as the responsibilities are defined in the system. Based on that it is known which tasks belong to whom and thus there are no dangerous shadow sectors left when it comes to safety.

Some deck officers felt that the most significant benefit of the ISM Code is that, as a result, the shipping companies are also required to commit to safety. According to the respondents, the system includes the company's aspiration regarding, for example, environmental policy or alcohol policy. According to one respondent, it is easier to operate and communicate in between the ship and the "office", when also the "office" has the responsibility to take care of safety. According to one respondent,

> *"the problems won't disappear themselves, but the company has to take care of them for real."*

According to some deck officers, people who work on ships actually think about safety. They see that nowadays the ISM Code is an essential part of seafaring and its existence is no longer questioned. One respondent told that especially those who have come to the maritime field after the introduction of the ISM Code, consider it a natural part of their

job. According to one respondent, safety management is a fundamental prerequisite for contemporary seafaring.

Some interviewees said directly that maritime safety has improved. They saw that the amount of accidents has declined because of the introduction of the ISM Code. Some respondents reported that especially the amount of accidents and injuries has declined. One respondent felt that working on ships is safer now as accidents occur less.

Engineering officers

According to some engineering officers, safety culture has improved as the division of responsibilities and roles have clarified both on the ship and between the ship and the shipping company. According to them, it is a good thing that the ISM Code requires the companies to coordinate safety. One respondent sees that it's a good thing that at least someone tries to improve safety from the company's side. Another engineering officer said that, because of the system, you know who to contact and you can be sure that the company has to take a stand on the matter. According to one respondent, the system helps the communication between the ship and the shipping company. One respondent said that the system has clearly accelerated the reaction time of the *"land side".*

According to some engineering officers, it is easier to familiarise new employees, when you can hand them *"the ship's user manual".* According to one engineering officer, the safety management system is clear and comprehensive and due to that a new employee or someone who has changed ships does not become uncertain but knows the order in which things must be done.

According to one engineering officer, with the safety management system, they have had to prepare for special occasions beforehand, for example for black outs or collisions. The checklists he has prepared for such situations have been useful. According to another respondent, prior training for emergencies and other special occasions has been a significant improvement brought on by the safety management system.

Crew members

According to some crew members, the safety management system has provided clearer guidelines that are easier to adopt. According to them, the thinner the manual the better the system, because that means it only includes the relevant issues.

According to some crew members, a sense of safety and risks has come to the ships and the shipping company due to the ISM Code.

Hotel and catering staff

According to some respondents from the catering department, the systems are already quite comprehensive and they have become clearer with time. According to some, there are still improvements needed, but on the other hand, the interviewees see that it is the sole purpose of the safety management system to find the improvement needs and to fix things. According to one respondent, it is a benefit that the system has been in a constant development. Another respondent said that improvements can be made while learning from mistakes. One respondent said that things have been improved, since, for example, mistakes have been discussed after the training.

The interviewees told that the ISM Code has brought systematization to the field and clarity to operations. According to one respondent, one of the good features of the safety management system is that the information is easily available.

> *"You can create your own thinking and framework for your job around it."*

According to some members of the catering department, responsibilities have also become clearer with the ISM Code as everyone knows who does what. One respondent sees that due to the clarification of responsibilities it is now possible to trust and rely on other people, which creates a feeling of safety for her. According to some respondents, it increases the feeling of safety when you know what must be done in various exceptional situations and the actions have also been trained together. One respondent told that he knows her own duties and know how to react as required by the situation, for example during an emergency. She wishes that she then accordingly knows how to

act correctly in the case of a real life situation. According to one respondent, you can pretty much rely on the fact that neither you nor anyone else comes up with *"your own stuff"* during an emergency, but relies on training and the procedure presented in the manual and applies them. According to him, it is a good thing that there is one common model.

Some respondents noted that safety management has improved communication both on board and also in the whole shipping company. According to them, now you know who to contact if it is necessary. Some respondents saw that improvements have come with the system as the system forces the company to take a stand on safety matters. According to one respondent, nowadays on the ship and in the shipping company, the deficiencies are corrected significantly better as the company has taken more responsibility.

One respondent mentioned that if you want the system to be useful

"it must be read".

One respondent said that the ISM Code has unified the procedures everywhere, also in other shipping companies and internationally. He thinks that it is a good thing that everyone needs to meet the basic requirements and everyone is controlled in the audits and inspections based on the same principles. Hence, the safety of the whole industry is enhanced.

Management

According to some respondents, the ISM Code can be seen as a successful solution for the most part. One respondent stated that if you maintain the safety management system well, you ensure the most important thing i.e. safety. Another respondent stated that today, you could not get by without a system like that. According to him, if it did not exist yet, it should be invented. According to some safety managers, nowadays people identify risks better and *"safety thinking"* has been introduced on board due to the ISM Code.

According to some respondents, the ISM Code forms a great *"backbone"* and, on that basis, the procedures can be further developed and improved. One respondent told that the safety management system offers the basis, from which you start the improvements. He sees that the system helps to identify the current state, which makes it easier to go further by improving the procedures.

The management representatives saw that the safety management system has improved the communication between the office and the ship. According to one respondent, the cooperation between the shipping company management and the ship has gotten visibly closer. He thinks that, for example, through the internal ISM audits it is possible to get better contact with the ships. Another respondent felt that the audits enable continuous discussion regarding the ship's safety level. One respondent stated that the shipping company cannot avoid responsibility, thus, for example, problems and deficiencies that come up in the audits have to be mended.

According to one safety manager, regular meetings between the ships and the shipping company and the fact that information is exchanged between ships have improved communication, among other things. One respondent saw that deviation reports are a good way to know what is happening on the ship.

Some respondents felt that nowadays training is more organized and regular, due to which the actual readiness state for emergencies is better. The respondents think that the systematization can be seen in other operations also, such as service and maintenance. According to one respondent, the systematization is also seen in the audits due to the fact that in the audits the ship's issues are scrutinized more carefully. According to one respondent, the safety management has brought systematization and standardized the procedures, which has made it possible to learn from other ships and made it easier to give guidelines to the ships.

The management representatives think that the fact that important issues have been documented is a clear improvement. According to one respondent, with the written instructions it is possible to trace and, if necessary, prove that such a procedure has been

instructed. One respondent thought that it is excellent that all the necessary instructions can be found in a single document. He notes that it is also good that the important occurrences are written down, for example, the completed trainings are documented. One respondent stated that documentation makes the issues possible to trace.

Some respondents saw that safety management has improved the shipping companies' profitability. According to them, they have managed to achieve savings by avoiding accidents and, on the other hand, they have succeeded in maintaining the schedules better. One respondent told that due to safety management, such accidents that could have caused major costs have been able to be prevented. According to another respondent, safety actions bring savings and clear economic benefits. According to one respondent, the costs caused by the ISM Code have been very small compared to the benefits gained due to the systems.

According to some respondents, you can guarantee the continuity of operations with the safety management system, since history data of the ship's usage and problems is gathered in the system that can also be used by the members of new personnel during personnel changes.

Maritime inspectors

According to some maritime inspectors,

> *"safety culture has gradually developed in shipping"*

due to the safety management system. They think that positive development cannot happen overnight, but during the years, some clear improvement has happened. One respondent sees that there has been a *"change in attitude"* to the right direction amongst seafarers. Another respondent feels that the introduction of the ISM Code has affected the situation, so that

> *"safety issues have been acknowledged and the issues are continuously addressed for example during training and audits".*

According to one respondent, the maritime personnel's *"thinking"* have improved. He thinks that

"the gang knows what each of them must do".

One maritime inspector stated that the ISM Code has

"forced to think about possible dangerous situations and threats".

According to one respondent, you can see a change in attitude in maritime personnel, as they see that all of them have important duties regarding safety and they know those duties well and can act in the required manner. The respondent sees that this is manifested as the personnel's professional pride.

Some maritime inspectors told that the ISM Code has had the strongest influence in improving safety in the average shipping companies, in which, for example, the duties and roles were clarified and orientation was enhanced. The good shipping companies already had corresponding safety management systems before the introduction of the ISM Code. According to the respondent, the good shipping companies have not made much progress and the worst shipping companies unfortunately are still inferior.

The maritime inspectors who inspect both Finnish ships in the ISM audits and foreign ships in port state control reported that the ISM Code is applied well in the Finnish ships and there are not that many poor ships among the Finnish ships. Instead, they felt that there are great differences among the Baltic Sea countries regarding how well the ISM Code is applied. In addition, they said that amongst the foreign ships they also found very poor ships, in which both the system was executed poorly and also all the other things were handled in a bad way.

According to some maritime inspectors, safety management has clarified the operations as everyone knows their own duties in different situations. One respondent mentioned that nowadays the personnel know their duties better and, with the safety management system, their training regarding their own area of responsibility and duties is better and more thorough. One respondent said that the documentation of the safety management

system has clarified the functions and made it easier to monitor the operation. According to him, the operations nowadays are easily traceable.

Some maritime inspectors had noted that the ISM audits are considered useful on the ships. One inspector told that the ships' personnel often bring up defects that they want to have corrected during inspections. He thinks that the personnel have the courage to report the problems and defects as well. Another inspector said that the ships' personnel might even wait for the outside auditor so they could bring up the issues. According to one respondent, the external audits motivate the personnel, since usually the course of trainings is inspected during the audits. He thinks that the personnel respect the outside views on improving the training, because actual real life situations, in which you could test your skills hardly ever come your way.

Observations

The responsibilities of the personnel were also considered during the audits. The personnel were asked about, for example, their responsibilities with regard to the safety management system and whether they were familiar with the requirements in relation to their own duties. They were also asked to show where they can find the relevant documents regarding the tasks they were responsible for. It was noted that the auditees were not ashamed if they did not know the correct answers to the questions of the auditors. However, the observations supported the indication of the interviews that the personnel knew their duties and knew how to react as is required by a particular situation. The observations also supported the indication that responsibilities were clarified with the implementation of safety management systems.

5.5 Deficiencies of the ISM Code

Masters

The interviewed masters said that quite often the documentation of the safety management system is written too complicated and detailed. According to them, this has led to the fact that you don't want to follow the system's requirements in practice.

One master said that the system might appear good on paper but is actually so far from the practical operation that applying it can even be impossible.

According to some masters, the shipping companies provide updates and additions to the system too often. One master called this "*over documentation".* One master said that previously the safety management system manual was short and concise. He sees that the current manual has grown to be too thick as they have not stuck to the requirements of the authorities. He thinks that the shipping company aims to exceed the requirements, which has led to issues with excess meticulousness and an irrationally large number of manuals. According to one master, the excess documentation may result from the onshore personnel's need to emphasize their own importance by creating new instructions, even though the instructions might not be necessary in practice. One master wished that the development of the safety management system would come from the ship and would not be dictated by the office.

According to some masters,

> *"there is a risk that people from the office hide behind the ISM Code and do not take real responsibilities for their actions."*

These masters assumed that this is caused by the fact that the shipping company aims to create precise documentation on the procedures in case that something happens. In that case, the shipping company would be able to prove that the instructions were not followed on the ship. According to one master, in that case the basic purpose of the safety management system is to protect the shipping company from the seafarers. He suspected that if you create detailed instructions on everything, you can always find some instruction that has been omitted. In that case, you can blame the seafarer for the damage. According to one master, the shipping company opts out from responsibility if the manual has not been followed. He thinks that the shipping companies aim to limit their responsibility by creating excess documentation.

One master wondered why the issues have to be written up and documented so meticulously and why education and professional skills brought on by experience are

not trusted. Another master suspected that the seafarers' ability to solve problems disappears when practically every operation has meticulous instructions. He sees that the systems have become so detailed that it is not possible to follow them verbatim, in which case infringements of the rules are inevitable.

According to the masters, the safety management system requires too much paper work, because they see that they often have to use unnecessary checklists and fill out different notifications and reports. One master saw that all paper work in the form of checklists, notifications and deviation reports takes time away from safe navigation and sufficient rest time.

> *"The whole increase of bureaucracy has jeopardized safety. This is a safety risk. Maritime safety does not improve by adding files on the bridge."*

> *"The bureaucracy is irritating after all. However, it has been forced to adapt to it nonetheless"*

The interviewed masters saw that there are too many inspections. According to one master, the ship is under some inspection almost daily, as it operates in many ports in the Baltic Sea. Another master said that the same issues are gone through and the same trainings are performed to please the inspector in both the ISM audits and in port state control inspections. The inspections of the different authorities are overlapping as they often inspect the same issues. The inspections take up a lot of time from the masters during port calls, which are busy anyways. According to the masters, also the interpretation of rules varies greatly between different countries. One master said that even inside the EU, there is no uniform policy. According to one master, especially on passenger ships and tankers the amount of inspections is excessive, which decreases the motivation for safety management.

> *"When there are a lot of inspections and they are considered futile, you are tempted to merely sign for the issues on paper and not actually do them. The forms are filled up merely because they have to be filled; you merely go from where the fence is lowest and take shortcuts if possible."*

According to one master, in their shipping company they have not yet reached uniform procedures between the different ships owned by the company. He thinks that the

routines differ too much even between sister ships. He sees that the "office" should be more active in passing information on good practices from one ship to another. According to another respondent, the ships and also the shipping companies should exchange safety related information better *"so that we could learn from each other."* He sees that you should not compete when it comes to safety, because if an injury or an accident occurs to someone, it would harm the whole industry.

Some masters criticized the ISPS Code[9] strongly. According to one master: *"The ISPS is just absurd – damn!"* According to another respondent, there are too many separate branches in safety and security, for example when the ISM Code and the ISPS Code both require their own systems and audits. One master felt that there are too many systems in use, which causes inflation in the attitudes towards each system. He sees that this can lead to indifference and to situations in which, for example, the ISM Code is applied poorly, thus leading to the benefits of the ISM Code being diminished. According to one respondent, all security and safety related issues have increased in number, which has increased the work pressure as the shipping companies have not allocated more resources on the ship.

Deck officers

According to the interviewed deck officers, the problem with the safety management system is excessive documentation. The deck officers said that the systems include too many issues that are not needed in practical work or the systems have grown too detailed. According to one respondent, excessive details can turn the personnel into mere checklist fillers without the ability to identify and notice actual safety problems. Another respondent said that the systems have been inflated with excess details so that the users cannot easily find the relevant information and the systems also impede the maritime personnel's initiative.

[9] The International Ship and Port Facility Security Code (ISPS Code) is a comprehensive set of measures to enhance the security of ships and port facilities, developed in response to the perceived threats to ships and port facilities in the wake of the 9/11 attacks in the United States. The ISPS Code is implemented through chapter XI-2 Special measures to enhance maritime security in the International Convention for the Safety of Life at Sea (SOLAS), 1974. The Code has two parts, one mandatory and one recommendatory.

One respondent stated that excessive documentation occurs, when the people in the shipping company or on the ship want to make themselves important, in which case unnecessary additions to the system are made. Another respondent even said that often the company wants to wash their hands of the matter with excessive documentation, as they are not willing to take responsibility for their own operation. He sees that this is a way for the company to watch their own back in a case of a possible accident situation.

Some deck officers felt that safety management has become too bureaucratic with the increased paper work, reporting and inspections. Some deck officers said that the bureaucracy has increased also because there are so many audits and inspections done on the ships that concentrate on going through the same issues.

According to some deck officers, there are far too few people for the developing of the safety management system and for continuous improvement. One deck officer said that the workdays are long as it is and the schedules are so tight that there is no time left for development work. Another respondent said that the working hours are spent precisely in operational tasks, in which case there is not enough working time left for fixing and developing the safety management system.

Engineering officers

According to some engineering officers, the ISM Code has increased bureaucracy significantly. One respondent said that this is manifested in constant changes to the system, which you do not have enough time to absorb. Another respondent said that the bureaucracy is manifested in too meticulous instructions. He sees that the *"office"* might be watching its own back with excessive documentation, which he calls information overload. According to one respondent, the safety management has been rendered unpractical bureaucracy, in which you concentrate on filling up checklists instead of actually taking care of safety. One respondent stated that due to safety management, people are nit-picking over the small things and, at the same time, concealing the bigger *"mistakes".*

"there is a risk of pettifogging"

Crew members

According to some crew members,

> *"safety management is extravagant "riffling" of papers that slows the working."*

They think that the systems are made too meticulous, which leaves no room for the use of you own brain and seamanship.

Hotel and catering staff

One member of the catering department said that the office personnel often create instructions that are far from practice. He thinks that it is not always rational to do things the way that the office's instructions require. According to another respondent, their system includes even such instructions that are practically impossible to be carried out in the way they are written.

Management

According to the management, safety management causes a lot of bureaucracy. They think that the system is taxing, slow and difficult to handle, which diminishes its potential benefits. According to one respondent, the system causes excessive paper work both in the office and on the ships. He sees that there are not enough personnel resources in either end, so that the maintaining of the system and all reporting could be done without interference to the actual work.

According to some respondents, the descriptions of the procedures and division of duties in the safety management systems has gone too far and become too detailed, which in practice even hinders the independent thinking on board. They see that there is a danger that the system is followed too schematically and thus you do not know how to react correctly to changing situations, which increases the risk of maritime accidents.

One respondent said that one problem that increases the bureaucracy of safety management is overlapping inspections, as the same issues are inspected, for example, in the ISM audits made by the flag states and in port state control. Another respondent

saw that the monitoring of the application of the ISM Code and the inspections are ineffective. He pointed it out that there are ships in operation that have been issued, for instance, several notifications in port state control and they have even been detained, but yet they have not been able to get the ships out of operation. He wondered why the ISM certificate is not taken away from such ships altogether. According to another management representative, the inspections are not done consistently. In some ports they are performed really diligently and in other ports the same issue is not considered a deficiency.

One respondent said that safety management systems include a lot of things that are self-evident and he sees that they are not relevant with regard to safety. According to him, this disrupts the ships' masters' concentration and overburdens them with unnecessary reporting.

One respondent said that the enthusiasm regarding safety management has declined recently. He sees that it no longer raises passion in anyone. Topics regarding safety management have been left out from the public debate in the maritime field. For example, seminars are no longer arranged on the issue.

Maritime inspectors

According to some maritime inspectors, safety management burdens the users somewhat too much, since it includes so much filling out papers and report writing.

Some maritime inspectors saw that the ISM Code itself has no deficiencies, but there are still great defects in applying the systems. One respondent said that this is manifested in, for example, the fact that the safety management systems are not actively developed. He thinks that the different reports should be utilized better in learning and the development of the systems. According to another inspector, in some shipping companies the development has stopped after the completion of the first version of the system. One maritime inspector thought that even they, i.e. the authorities, do not sufficiently support the safety management system related development work that is done in the shipping companies. Another maritime inspector stated that a good indicator

of the functionality of the safety management system is how actively the manual is updated. During the inspections, ships have come up in which the safety management system has not been further developed and the manuals have not been updated. He noted that, on these kinds of ships, you often detect other safety management related defects also.

> *”If the papers are in a mess, lots of other things are in a mess too.”*

According to one maritime inspector, one reason for the problems is the inconsistency in interpreting the ISM Code both in the shipping companies and amongst the authorities.

Some maritime inspectors felt that during the introduction of the ISM Code the systems ended up too taxing and detailed, in which case they became quite ”on paper only”-like and too far from the practice. The ISM audits they have performed have proven that the smaller the file, into which they have compressed the system, the better they have found the core of safe operation. According to one respondent, some shipping companies still have overly burdensome systems, the updating of which is difficult, and unfortunately the systems often include outdated facts which, according to him, can lead to unnecessary deviations. According to one respondent,

> *“if a system is too complicated, the users do not bother to familiarize themselves with it and the essential things are left undone.”*

One problem was said to be the fact that the shipping company’s system might be copied from another shipping company and thus, the system may include issues that are not complied with or the system requirements are considered to be too overwhelming to be followed.

One maritime inspector said that safety related information does not flow correctly. He considered it to be a specific problem that proper communication does not always exist between the shipping companies and the authorities. He thinks that everyone should

strive toward a situation, in which everyone would feel like they are on the same side, enhancing safety and developing safety management. He wished that there would not be any confrontations between the shipping companies, the ships and the authorities.

According to some maritime inspectors, there still are shipping companies that deliberately operate against the rules. The maritime inspectors reported that during port state controls they have faced ships, regarding which there are suspicions that the ”company policy” of the shipping company owning the inspected ship is to operate outside the rules. During the inspections, it has come up that the watch rules and rest time rules are regularly breached. Nevertheless, according to the respondents, these are fortunately only individual cases.

Observations

The earlier observation that the auditors paid a special attention to the currency (being up to date) of the documentation was verified during the audit. Some non-conformities regarding the documentation were detected by the auditors. It was found, for example, that the documentation did not correspond with the daily operations. It was also found that sometimes the checklists were not filled in properly. It seemed that people trusted that they could perform their duties by heart. The auditees claimed that the checklists had proven to be useless. Sometimes the checklists were completed afterwards, for example, during the watch on the bridge. It was also revealed during the audits that the documents were sometimes not updated with the new versions, which generated several non-conformities within the company.

5.6 Incident reporting

In order to evaluate how the measures aimed at continuous improvement have developed in the shipping companies, the interviewees were asked how the incidents have been reported and analysed in their shipping companies. Reporting and investigating incidents are considered to be an integral component of continuous improvement in the safety management system (IMO, 2008b). Most of the interviewees

started to discuss the incident reporting spontaneously during the interviews and the issue was handled with almost all of the interviewees.

Masters

The interviewed masters said that the threshold for reporting non-conformities, accidents and hazardous situations (incidents) is still unnecessarily high. They said that the personnel still have a negative attitude towards reporting. According to some masters, reporting has been clearly neglected. The masters noted that very few reports are made, only a few in a year. One master said that the neglects of reporting have come up in other contexts. For example, during one occupational safety and health inspection events had come up, from which incident reports should have been made at the time. According to some masters, the personnel are reluctant to write reports, even though they gladly discuss the events in the suitable contexts. Some masters said that the reasons behind poor reporting include, among other things, the fact that it is laborious to put things on paper and the electronic reporting system is stiff.

According to some masters, it is more difficult for people to report on human errors than on technical defects. One master said that nearly all reported incidents are related to technical difficulties. Another master saw it as a problem that sometimes the actual reasons behind the error are not revealed. He gave an example, in which the reason behind a black out was reported to be a technical defect, even though the actual reason had been the fatigue of the engine ratings.

The masters said that it is not always necessary to write incident reports on every little thing, but also those things should be dealt with together with the ship's personnel. According to one master, only the events that have wider importance should be brought to general knowledge through reporting.

According to one master, the fact that the little things are not reported distorts the situation, when you are unable to assess the "overall risk".

Deck officers

According to some deck officers, the reaction towards the completed incident reports is poor. One respondent saw that the feedback on the reports comes too slowly and the corrective measures take too long time. One deck officer said that you do not get feedback on incident reports. He feels that the reports end up in some kind of a *"black hole".* According to the respondents, the shipping company's unresponsiveness towards the completed incident reports impairs the personnel's already weak motivation for making reports.

According to some deck officers, incident reporting has been made too formal. One respondent said that their reporting system is stiff, due to which many neglect the reporting. There is not enough reporting and analysing. Some wishes have been expressed regarding what kind of things could be learned from the incidents of different ships.

Engineering officers

Some of the engineering officers said that it is their responsibility to make reports regarding machinery, firefighting and fire protection equipment. One engineering officer said that feedback and corrective actions related to the incident reports have sometimes been neglected or delayed.

Crew members

The crew members admitted that they had never made an actual incident report. According to them, usually the ship's master or the chief engineer makes the reports. Yet, they stated that if something deviant had happened, the issues related to it had been discussed. As far as they know, no actual incident reports are made based on those cases, but the cases are discussed and resolved on the ship.

Management Representatives

The management complained that still too few deviations are reported. One safety manager wished that the incidents would be established and reported more boldly and more often. One safety manager said that shortly before the interview, he had given a notification to a ship, because they had not reported on a minor accident. According to him, incident reporting is continuously neglected. Some safety managers said that the ship crews still do not understand the meaning of incident reporting or recognize what should be reported. One safety manager wished that the ships would understand that the reporting is for the ship personnel's own good, since safety can be enhanced by reporting.

Some safety managers wished that the authorities that monitor the ISM Code would monitor incident reporting more strictly. They think that the authorities should also study completed incident reports and, based on that, make recommendations and instructions on improving safety for the use of all seafarers.

Maritime inspectors

According to the maritime inspectors incidents are reported very poorly. One maritime inspector stated that specifically in this matter the ISM Code has failed.

Some maritime inspectors said that the personnel do not lack the actual courage to write reports. According to them, the reports are, in most cases, omitted because of other reasons than the fear of punishment. The respondents suspected that the personnel do not bother to report near miss situations or minor deviations if no damage has been caused or if the matter is not relevant to others, in their opinion. According to some respondents, the personnel are reluctant to make written reports, even though the incidents can be otherwise openly discussed on the ship or they can be discussed verbally with the shipping company's safety manager. According to one maritime inspector, people report on technical defects more often and more easily than human errors.

According to some maritime inspectors, maritime personnel are reluctant to report their own mistakes and reports can easily be omitted if the issue does not come up in a different context. Some respondents felt that some members of the personnel still have the idea that everything is fine if nothing is reported. Some respondents think that secrecy still occurs in situations in which outsiders have not been there to witness the problems.

The maritime inspectors said that sometimes they have given a notice to a ship if no incidents have been reported on the ship for a couple of years. The maritime inspectors themselves have worked on board and, based on that, they know that it is almost impossible that nothing had happened on the ship for a couple of years. They suspected that the near miss situations are probably dealt with on the ship, even though they are not reported.

Observations

The observations provided an ideal opportunity to investigate the functioning of the incident reporting in practise. It was noted during the observation that particularly the external auditors paid special attention to the incident reporting process. They were interested in ensuring that the process had been implemented and was functioning on-board. The auditors checked that the reported incidents were handled duly and corrective measures were carried out. The masters of the vessels were asked about the number of reported incidents per year during the audit. 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 one to three cases were reported per vessel per year. In some vessels, the reported number was as much as 20 – 30 incidents per year per vessel.

The observations confirmed that the reporting of incidents were evidently neglected. For example, during an audit on one ship, an occurrence was found in the logbook, which should have been reported to the company as an incident.

The auditees and the auditors discussed incident reporting several times during the course of the audits. The auditees stated that the majority of the reported incidents were related to technical failures. Human errors and near-misses were reported very seldom, although it is a known fact that human errors represent the majority of incidents and it was admitted by the auditees that near-misses are not rare. Nevertheless, the observations revealed that the auditors did not consider the small amount of reported incidents to constitute any non-conformity.

However, while discussing the incident reporting with the auditees during the audit, it was found that the personnel seemingly understood the purpose of incident reporting, although they admitted to the auditors that they had made reports very seldom. In fact, they were not ashamed of their poor reporting activity.

5.7 Interviewee's proposals for the improvements of the ISM Code

According to the respondents, the ISM Code hardly requires any changes. They think that the Code is good as it is, because it gives the shipping companies high degree of freedom in applying it. No amendments regarding the ISM Code itself were suggested during the interviews. All suggestions for amendments were related to the application of the ISM Code (as indicated below).

Masters

According to some masters, the safety management systems should be simplified. One master complained that the all the excessive "junk" should be weeded out of the systems. Another master suggested that the system should be made significantly shorter and more concise.

According to some masters, more general instructions for the application and examples of good practices are needed. One master wished that there would be model examples on how the issues could be described in a more simple way.

Deck officers

According to the interviewed deck officers, the safety management systems should be made more compact and the relevant information should be uncovered. Some deck officers felt that, in order to modify the systems into a more simple form, more of the ship's perspective should be used. According to the deck officers, the written system does not always correspond with how the tasks are done in reality. They think that either the manual or the routine should be updated.

Crew members

According to the crew members, the safety management systems should be simplified or re-written completely. They think that the relevant issues are covered with unnecessary details.

Management

According to one safety manager, the shipping company management should commit to safety management better and more genuinely, not merely formally. He thinks that nowadays it is too often enough that the audits are passed and the certificates remain valid. No one bothers to strive for actual continuous improvement. According to another management representative, the shipping company management should not be satisfied with merely making the auditors happy. He sees that the management has a false assumption that

"*if the papers are in order, the ship is in order".*

According to the respondent, this is not the case.

Some management representatives wished that the ISM Code would be developed so that models and examples of best practices would be produced. One safety manager thought that information about best practices is needed, so that all the shipping companies would not have to *"reinvent the wheel".* According to one safety manager, uniformity is needed for incident reporting, so that the results would be comparable with other shipping companies. Administration could make recommendations on that. In addition, the administration could produce facts by analysing the incident information collected from the shipping companies and, based on that, give out

recommendations. The industry should have a procedure, with which *"peer support"* regarding safety management could be generated between the shipping companies. One safety manager stated that the results of the audits and deviation reports are not followed. In his opinion, what should be monitored is how effective the measures are. Also information about measures that have been proven to be good should be disseminated across the whole industry.

According to some safety managers, the functions should be described in the systems in such way that excessive work can be avoided. One respondent said that this is possible if you stick to documenting the functions in such a manner that they correspond with the actual work done on the ship. Overly meticulous task descriptions should be reduced and more room should be given to the seafarers' professional skills and their own thinking. According to some respondents, the manuals of safety management should be simplified.

Some respondents saw that the aim should be to reduce bureaucracy, not to increase it. According to one respondent, both the personnel on board and the authorities should be made to realize that the system is made for the ship's crews, not for the authorities.

According to one safety manager, the responsibilities regarding safety management should be distributed more evenly, so that the tasks are distributed to several people in the shipping company management. One respondent said that the responsibility should also be distributed to the ship's officers to a larger extent. The safety organisation on shore should be more like a support organisation and the actual tasks and decisions should be made on board.

Maritime inspectors

According to the maritime inspectors, the safety management systems should be simplified. One maritime inspector suggested that perhaps the administration should make a "light version", which the shipping companies could apply if necessary.

5.8 The Role of the administration in the implementation of the ISM Code

Masters

According to some masters, the ISM audits performed by the authorities have been useful because during the audits you can get an outside view on what needs to be improved.

"Strange eyes always see more as you yourself become blind."

According to one respondent, the awareness that there is a chance for an ISM audit or port state control keeps the personnel alert and in a good level of preparedness when it comes to safety. Another respondent felt that the authorities' ISM audits and port state control also ensure that the more poor shipping companies maintain even some sort of a safety level as well, as they know that they are being monitored.

According to some masters, there is not much to criticize in the ISM audits performed by the authorities. They told that nowadays the authorities act appropriately.

In contrast, some respondents said that the authorities' perspective is not right. They complained that the authorities' are focused too much on finding mistakes. According to them, it would seem that during the inspections the authorities seek out the weaker points intentionally. One master said that you can always find individual flaws if you seek them out meticulously, but, according to him, the inspectors are not able to see the overall safety. Another master noted that the authorities are too focused on scrutinizing the papers instead of estimating the practical safety management. Continuous improvement is not evaluated during ISM audits or port state control. According to one master, the authorities should have a more developing approach and they should encourage the shipping company and the ships to continuous improvement in some way. He sees that there is too little encouragement and support for development and improvement.

Some masters said that the attitudes of Finnish authorities are relatively appropriate. In comparison, in many other countries the inspectors that had come to perform port state

control have been too bureaucratic. According to one respondent, in some countries the attitudes are very authoritarian and demeaning. Another respondent told that the authorities' approach is very meticulous. One respondent told the interviewer that the interpretation of rules by the authorities of different countries varies greatly and the interpretations may be contradictory.

Deck officers

According to some deck officers, audits performed by an outside authority are useful as the audits make the personnel review the safety management system in the spirit of repetition. One deck officer said that an outsider can bring new perspective to the ship's functions and keep the personnel alert when it comes to safety.

Some deck officers thought that there are too many inspections, since same issues are dealt with in different inspections. One mate suggested that there could be only one inspection, to which several parties (such as authorities, classification societies and vetting inspectors) could participate in. According to some deck officers, there is too much variability in the inspections of the authorities of the different countries as the rules are not interpreted consistently.

According to some deck officers, the audits are too meticulous or their aim is merely to seek out flaws. They think that the authorities should have a more constructive role in audits, during which safety should be reviewed more comprehensively and making improvements should be encouraged.

Some deck officers stated that the audits made by classification societies have a more development-oriented and constructive approach than the audits made by authorities.

Engineering officers

According to some engineering officers, there is not much benefit in the audits made by the authorities. Some of them saw that during the audits, the focus is merely on finding flaws and they are too meticulous. According to the respondents, you should be able to get such feedback from the audit that helps you to make improvements. The respondents saw that the authorities do not give enough encouragement for continuous improvement.

One respondent said that the audits can provide more weight to safety improvements. If the office does not provide money, then perhaps through the outside audit you can get your voice heard.

Some engineering officers thought that the authorities of different countries do not act consistently, as the rules are interpreted in different ways.

Management

According to some safety managers, the audits done by authorities are somewhat useful. They felt that sometimes an outside auditor can see the cases more clearly and more comprehensively than an inside auditor or own personal, because outside auditors have experience from several ships and shipping companies.

The safety managers saw it as a defect that there are many different inspections (ISM audits, port state control and vetting inspections on tankers). During the inspections, the same issues are inspected and the interpretation of rules varies greatly between the auditors and between countries.

Some safety managers complained that administration is not manifested in anything else than audits. The administration does not, for example, send circular letters or recommendations. The administration does not encourage and the administration does not have a role in developing safety. According to the respondents, the administration's work is focused too much on details rather than the big picture. Some respondents said that the administration merely seeks flaws.

Maritime inspectors

According to the maritime inspectors, the inspections they perform should be developed. The maritime inspectors noted that the inspection procedures vary depending on the auditor. The maritime inspectors said that the inspections vary also by country and the ships that operate in international traffic suffer from the divergent interpretation of rules in different countries. According to them, the same issues are inspected during the ISM audits and port state control. If the interpretations vary that time also, it causes problems and confusion on the ships and does not improve safety at all.

The maritime inspectors thought that there are too many inspections, since several authorities (for example the occupational safety authorities and maritime inspectors in Finland) and classification societies perform their own inspections in different countries. According to the respondents, the issues inspected during the inspections are overlapping. One maritime inspector suggested that the inspections should be combined, so that the different parties would come on board the ship at the same time to observe each other's inspections.

Some maritime inspectors felt that the audits should be developed into observations rather than inspections of details, during which the actual safety cannot really be perceived. According to some respondents, auditing training should be offered to both authorities and the shipping companies.

5.9 Summary of the main results

Table 8 provides a summary of the main results organised according to the respective research questions.

Table 8. Summary of the results

Research question		Findings of the study
1. The current situation of maritime safety culture		
	Management commitment	Both positive and critical reflections on management commitment.
		The management provided resources and funds for safety investments and safety trainings.
		The management had a visible role regarding safety.
		The management was criticised by similar examples. It was seen that sometimes the management commitment is merely talk and no action and the management is not always able to allocate resources and funds to safety work. In addition, the management's safety work is personalized in the DPA.
		Nobody said that the management are indifferent or negligent.
		In the light of the results of the research, it seems that the top management are responsible and aware of safety, yet they do not always have enough capacity to take care of the improvements and investments.
	Employee participation	The employee participation seems to be apparent. The interviews and the observations indicated that the maritime personnel are active and initiative and they are encouraged to discuss about safety issues. The personnel are participating actively and even enthusiastically in the safety trainings.
	Continuous improvement	Not much progress has been achieved. All interviewees admitted that the incident reporting does not work properly. The interviews and the observations revealed that very few incidents are reported. The audits revealed that the reporting of incidents was neglected, even in evident occurrences.
		The interviews and the observations revealed that the incident reports are sometimes discarded by the management and the remedial actions have been neglected.
2. How do the maritime personnel consider safety management?		
	Benefits	The implementation of the safety management systems has been regarded beneficial and essential among the maritime personnel. The fact that the ISM Code imposes responsibilities also to the company is one of the most significant benefits of the ISM Code.
		The interviews indicated that the safety management clarifies the different roles and responsibilities and it also has unified and systematized the procedures on board.
		The procedures related to safety are documented and the necessary instructions are easily found. The unified procedures and system documentation maintain the continuity of good practices on board.
	Deficiencies	All the problems and deficiencies were related to the application of the Code. The safety management system caused excessive documentation which was considered too complicated, too detailed and unpractical. The excessive paper work increases the feeling of unnecessary bureaucracy.
		The documentation is not applicable and it can be incompatible with the actual on board operations. The observations support this finding, deficiencies were found during the audits.
	Relationship with safety management	This study indicated rather positive conceptions of safety management. Safety management was considered essential and very beneficial among the maritime personnel.
		No one said that the ISM Code and safety management are unnecessary and they should be abandoned.
		Actually, the will to do things better came up more often during the interviews. And the wish for improvements and additional resources.

Research question	**Findings of the study**
3. Has the ISM Code changed the Safety Culture?	
The impact of the ISM Code	The ISM Code and the related safety management systems have brought a new kind of ”safety thinking” and a better “safety awareness” into the shipping companies and on board.
	The safety issues are on the scene continuously.
Other impacts/factors	Changes, which are related to the social relations. The hierarchy has been lowered and the management is no longer authoritarian on board.

6 DISCUSSION

The purpose of this thesis was to explore the Finnish maritime personnel's conceptions regarding safety management and its relationship with the concept of safety culture. Thematic interviews were applied as the main research method for this study. The target group consisted of seven Finnish shipping companies with their personnel as well as other interests groups of the shipping industry, with their officers that were in one way or another involved in maritime safety management. Observations were utilised as an additional research method. The results of the study were analysed qualitatively.

The study was based on the following research questions:

1. What is the current situation of maritime safety culture from the point of view of management commitment, employee participation and continuous improvement in the Finnish shipping industry?
2. How do the personnel of Finnish shipping companies see safety management? Do they consider it useful and beneficial and do they see any deficiencies in it?
3. Do the personnel of Finnish shipping companies feel like the ISM Code has changed the Safety Culture in the Finnish shipping companies?

The research approach to the first research question was to evaluate whether there has been progress with regard to these three safety culture fundamentals in the opinion of the interviewees. The research approach to the second research question was to investigate whether the interviewees have gained any benefit, help or support from the safety management systems in their daily work. Furthermore, it was investigated what types of disadvantages and deficiencies they had faced while utilising the safety management systems in day-to-day business and work. The research approach to the third research question was to survey the opinions of the interviewees and find out whether they feel that the implementation of the ISM Code has changed the safety culture.

These three research questions were largely satisfied by the findings presented in chapter 5. The overriding finding in this study is that the Finnish maritime personnel have rather positive conceptions regarding safety management. Safety management was considered essential and very beneficial among the employees. The management of the shipping companies have become more responsible and aware of safety. However, the

study also revealed several problems and deficiencies, which are related to the application of the ISM Code. According to the interviewees, the major problems related to the application of the ISM Code were excessive documentation, unnecessary bureaucracy and poor incident reporting.

This chapter analyses and interprets the findings in relation to the previous studies regarding the ISM Code and maritime safety culture. The chapter is organised into the following sections based on the three research questions:

1. Current situation of maritime safety culture
2. Maritime personnel's conceptions on safety management and safety culture
3. Impact of the ISM Code on the maritime safety culture

6.1 Current situation of maritime safety culture

The first research question sought to determine what the current situation of maritime safety culture from the point of view of management commitment, employee participation and continuous improvement is. The first research question was based on the findings of the accident investigations, which revealed that the managements were not committed to safety and the crew members were not participative regarding safety and that the industry had underdeveloped processes for the continuous improvement of safety (Department of Transport, 1987; Robinson, 1999; Kristiansen, 2005; Hänninen, 2007). It could be said that the safety culture was "poor". The research approach to the first research question was to evaluate whether there has been progress in relation to these three safety culture fundamentals in the opinion of the interviewees.

6.1.1 Management commitment

The commitment of the management is recognized to play a critical role in safety management (Reason, 1997; Collins & Gadd, 2002; Wiegmann et al. 2002; Richter & Koch, 2004; Guldenmund, 2010). In practice, the management demonstrates its commitment by showing a visible positive attitude towards safety by actively promoting safety and by ensuring that the safety activities of the company have sufficient financial

and other resources (Wiegmann et al. 2002; Anderson, 2003). It has been proved that poor management commitment was the major reason for the Herald of Free Enterprise accident and the Scandinavian Star accident. The accident investigations revealed that the managements of the shipping companies were poorly committed to safety, which was manifested by their indifferent and negligent attitude. (Department of Transport, 1987; Robinson, 1999; Kristiansen, 2005).

Based on that, it was a bit of a surprise that not many studies were targeted to evaluate the management commitment in the shipping industry. The literature review showed that the previous studies determining the efficacy of the ISM Code have been targeted mostly at the ships' crews (Ek & Akselsson, 2005; Bhattacharya, 2009; Knudsen, 2009; Gergoulis & Nikitakos, 2013). For example, Bhattacharya (2009) interviewed the management in order to find out their considerations on how well the ship's crew complies with the requirements of the ISM Code on board. Thus, it is important to focus on the management and its relationship to safety culture and safety management.

The interviewees of this study indicated both positive and critical reflections on management commitment. According to various interviewees, the management of the shipping companies have demonstrated their commitment better and better in the course of time, which has been manifested in the providing of resources and funds for safety investments and safety trainings targeted at the crew. In addition, some interviewees have noticed that the management have taken a visible role regarding safety. On the other hand, various interviewees highlighted their criticism by similar examples. They criticised that the management have refused safety investments or they have been passive with regard to safety. The results of the interviews indicated fine distinctions between the target groups. The ships' masters were slightly more positive than the deck officers and the engineering officers.

The results showed that safety management is embodied in the DPAs of the shipping companies. Particularly the deck officers and the engineering officers highlighted the role of the DPA as a representative of the management. In their opinion, the top management had no visible role with regard to safety management.

The management of the shipping companies was criticised due to the fact that they had not provided sufficient human resources for the safety management both onshore and on board. The results indicate that safety management rests on the DPA, which was considered insufficient. Furthermore, the interviewees hoped for more human resources on board to take care of the safety management activities.

Every interviewed group shared the view that the top management have indicated their interest in safety management and the top management have realized the importance of their role and commitment in regard to safety. The interviews revealed no opposite reflections. Nobody said that the management are purely indifferent or negligent. In the light of the results of this research, it seems that the top management are responsible and aware of safety, yet they do not always have enough capacity to take care of the improvements and investments.

In comparison to the recent studies (Bhattacharya, 2009; Goulielmos & Gatzoli, 2012; Bhattacharya & Tang, 2013; Kongsvik et al. 2014) regarding the communication between the shore and the shipboard personnel and the visibility of the management in safety related issues, this study indicates that the situation is much more positive. The management has paid visits on ships, although in most of the cases it is the DPA, who represents the company. Nevertheless, the interviews and observations indicated that the communication has improved.

6.1.2 Employee participation

One characteristic of a good safety culture is considered to be the possibility of the personnel to participate and the delegation from the upper-level management to act in safety related issues (Reason, 1997; Collins & Gadd, 2002; Wiegmann et al. 2002; Richter & Koch, 2004; Guldenmund, 2010). Employee empowerment to work actively in the field of safety improves the personnel's attitudes and motivation towards safety (Wiegmann et al. 2002).

The accident investigation of Herald of Free Enterprise revealed that the crew failed to carry out their duties and found the crew members to be negligent and irresponsive. The Crew members had taken a narrow view on their duties regarding safety. (Department of Transport, 1987). According to Hänninen (2007), the seamen were not active in making safety related initiatives or suggestions for improvement.

Earlier studies related to the ISM Code or to the maritime safety culture have focused on the on board maritime personnel (for example Ek & Akselsson, 2005: Bhattacharya 2009; 2012; Knudsen, 2009; Gergoulis & Nikitakos, 2013). These studies have indicated divergent results regarding employee participation and commitment to safety. Ek and Akselsson (2005) indicated that the ships have a generally high level of commitment to safety issues. "*The safety culture dimensions 'Attitude towards safety' and 'Safety-related behaviours' received especially high scores (Ek & Akselsson, 2005).*" On the contrary, Bhattacharya (2009) found that the requirements of the safety management system were not complied with very well by the onboard maritime personnel. The neglect was primarily caused by the incompetence and ignorance of the crew members (Bhattacharya, 2009). In his later study, Bhattacharya (2012) indicated that the "*employee participation in the management of shipboard safety were largely absent in the maritime context.*"

In the light of this study, the employee participation seems to be apparent. Each group gave a positive and consistent opinion regarding the employee participation. According to the interviewees, the maritime personnel are active and initiative with regard to safety. The personnel seek to find out answers independently and seek advice from their superiors when necessary. The personnel are encouraged to discuss safety issues and they really dare highlight problems and faults.

The representatives of the personnel expressed by themselves that they are active and take initiative with regard to safety. They are also encouraged to discuss safety issues with their superiors without any fear of being blamed or punished.

The importance of safety trainings was emphasised during the interviews. Each group shared a common opinion that the personnel are participating actively and even enthusiastically in the safety trainings.

The observations supported the indications of the interviews. The personnel seemed to be keen to take part in the drills and exercises during the observation visits on board the ships. In addition, the observations revealed that the personnel were encouraged to answer freely and openly to the auditors questions during the safety audits. For example, they spoke about the recent errors or problems even though they had neglected to make an incident report regarding them.

The representatives of the management and administration and the masters showed respect for the personnel during the interviews. The interviews indicated that the personnel do not neglect their duties and they comply with the requirements of safety management. In addition, the interviews indicated that the personnel know their roles and responsibilities regarding safety. This is in strong contrast with Bhattacharya's (2009) views, which indicated that the management considered the crew members incompetent and ignorant.

6.1.3 Continuous improvement

Reporting and investigating incidents is an integral component of continuous improvement in the safety management system (IMO, 2008). The reporting system could be seen as a cornerstone of safety management. With the reporting system, it is possible to identify the weaknesses and vulnerabilities of the organisations' safety preventively (Wiegmann et al. 2002; Eiff, 1999). According to Anderson (2003), a well-functioning reporting system indicates that the roots of the safety culture have been established.

According to Hänninen (2007), the sinking of Estonia was a systemic accident, with which Hänninen refers to the lack of risk management systems and the undeveloped state of the culture, in which different deviations and warning signals and corrective measures were not seen as necessary. The investigation of the Herald of Free Enterprise

accident supports that implication (Department of Transport, 1987). The investigation proved that similar incidents had happened earlier, before the accident of Herald of Free Enterprise. For example, her sister ships had left the port with the bow door open several times. Furthermore, similar bow visor failures had happened earlier, before the Estonia accident. Unfortunately, the maritime industry could not resolve these errors preventively (Hänninen 2007).

The previous studies with regard to the ISM Code have proven that there are still plenty of problems in incident reporting (Anderson, 2003; Ek & Akselsson, 2005; Bhattacharya, 2009; Oltedal, 2011; Oltedal & McArthur; 2011).

The results of this study indicate that not much progress has been achieved. Basically, all interviewees admitted that the incident reporting does not work properly. They told that very few incidents are reported. At first it seemed that the attitudes towards reporting were negative. However, the incident reporting was brought to discussion more or less spontaneously and the majority of the interviewees liked to discuss the issue, which indicates that the interviewees considered that incident reporting is, in any case, important.

Furthermore, the interviews indicated that the reports are sometimes discarded by the management and the remedial actions have been neglected. Sometimes the personnel have not received any feedback on their reports.

The previous studies have indicated that "a blame culture", which hinders good reporting, still exists in the maritime industry (Anderson, 2003; Ek & Akselsson, 2005; Bhattacharya, 2009; Oltedal & McArthur, 2011). This study does not support that implication strongly. The interviews revealed rather light indications of a blame culture. Other reasons were given for the poor reporting to a greater extent. The interviewees explained that they are not willing to make reports, because they have not gotten sufficient feedback. They don't believe that reporting would result in any remedial actions and that such actions would take too long time. Similarly, Ek and Akselsson (2005) found that "*the organisation ashore had represented slow bureaucracy, resulting*

in low feedback when a report had been submitted." In addition, the interviewees told that it is too cumbersome to write reports. Even the electronic reporting systems were considered too difficult and inflexible.

Although the reporting of incidents has frequently been neglected, the interviewees assured that the incidents are discussed on board. In addition to that, improvements are made, although written reports of this do not exist. The observations support this finding. The personnel discussed the incidents with the auditors quite frankly during the safety audits.

6.2 How do the maritime personnel see safety management?

The research approach to the second research question was to investigate whether the interviewees have gained any benefit, help or support from the safety management systems in their daily work. Furthermore, it was investigated what types of disadvantages and deficiencies they have faced while utilising the safety management systems in day-to-day business and work.

The second research question was based on the assumption that the maritime personnel have a negative attitude towards safety management systems. This assumption was based on the premise that safety management has been seen as, for example, burdensome bureaucracy and the requirements of safety management have been considered to indicate distrust in the competence and professional skills of the maritime personnel (Anderson, 2003; Bhattacharya, 2009).

6.2.1 Benefits of the ISM Code

The previous studies have rested on an assumption which is taken for granted and according to which the implementation of the safety management system provides inevitable benefits for its users, that is, the shipping companies and ships. However, the benefits have not been investigated thoroughly from the maritime personnel's point of view. Due to that, it was important to systematically investigate the maritime personnel's opinions regarding the benefits of safety management.

In general, the study indicated that the implementation of the safety management systems has been found beneficial and essential by the maritime personnel. The respondent groups were quite consensual about the issue. Moreover, nobody presented any arguments against the usefulness of safety management.

The interviewed personnel on board the ships shared a common opinion that the responsibility that the ISM Code imposes onto the company and the company management is one of the most significant benefits of the ISM Code with regard to taking care of safety.

The interviews indicated that one of the advantages of the safety management system is that it clarifies the roles and responsibilities on board, as they are defined in the system. According to the interviewees, the roles and the responsibilities have been clarified both on the ship and between the ship and the shipping company. The clarified roles and responsibilities provide several concrete benefits for the personnel: they know who to contact and they can rely on the fact that the company has to take a stand on the matter. In addition, the interviewees indicated that the clarified roles and responsibilities facilitate better communication between the ships and the office.

The interviews indicated that the safety management systems have unified and systematized the procedures on board, which has made the maritime personnel's job much easier. According to the interviewees, this makes it easier to orientate new employees and also for personnel to transfer from one ship to another. The interviewees shared an opinion that it is beneficial that the procedures related to safety are documented and the needed instructions are easily found. The users can rely on the fact that they are following correct, current and accepted guidelines provided by the documentation of the safety management system. According to the interviewees, they do not have to learn new things by trial and error. Moreover, the interviewees thought that the unified procedures and system documentation maintain the continuity of good practices on board, as the crew members are changing.

6.2.2 Deficiencies of the ISM Code

The interviews did not indicate many deficiencies regarding the content of the ISM Code. The Code was considered pertinent and the content of the ISM Code was not criticised at all. According to the interviewees, all the problems and deficiencies were related to the application of the Code. For example, the requirement of the incident reporting was considered important and useful and it was not questioned by any interviewee even though its poor application was criticised strongly.

Another contradictory example is the documentation of the safety management system, which was considered useful, in general, by the interviewees. The interviewees gave several examples regarding the benefits of the documentation of the safety management system required by the ISM Code. However, the study indicated a lot of criticism towards the implementation of the documentation. According to the interviewees, the major problem with the safety management system is excessive documentation. The documentation of the safety management system is sometimes written in a manner that is too complicated and detailed. Moreover, the documentation was considered unpractical and not easy to follow.

The interviews indicated that the safety management systems demand excessive paper work due to the updating of the documents as well as due to reporting. According to the interviewees, the feeling of unnecessary bureaucracy has increased due the increase of paperwork and many overlapping audits and controls focused on the safety management system. The study indicated a lack of human resources caused by the bureaucracy. The interviewees highlighted that the increasing bureaucracy causes extra workload, resulting in the suffering of other duties. In addition, the lack of human resources was manifested in the fact that the safety management has been personified in the DPA. The personification was considered a problem since the DPA cannot be everywhere, which results in the fact that the progress of the safety management system is stagnated in the shipping company. One significant aspect that was also manifested in the study was that, according to the interviewees, the excessive documentation can actually lead to a situation in which the documentation is not applicable and may be incompatible with the onboard operations.

The previous studies have indicated similar findings regarding the feeling of excessive paperwork and unnecessary bureaucracy (Batalden and Sydnes, 2014; Kongsvik et al. 2014). For example, Anderson (2003) found that the systems were made too burdensome and complex, in which case the adoption of the systems was difficult and they were received as bureaucratic paper work. In addition, Oltedal (2011) found many examples in which the system documentation was not applicable, was incompatible or did not reflect the onboard operations. Both Oltedal (2011) and Anderson (2003) concluded that the documentation has been received as burdensome and not applicable to practise if the experience and expertise of the maritime personnel have not been utilised during the documentation work (see also Kongsvik et al. 2014).

The results of the interviews support the conclusions of Oltedal (2011) and Anderson (2003) in that the competence and experience of the crew on board had been ignored during the documentation work. In addition, the interviewees believed that the personnel would be more committed and compliant with the safety management if they had been more engaged in the documentation process. Oltedal (2011) also suggested better integration of the operating personnel's experience and expertise, in order to lessen the problems of excessive documentation.

6.2.3 How do the maritime personnel see safety management?

The previous studies indicated that the maritime personnel have had a negative conception of safety management. According to Pun et al. (2003), particularly during the initial phase of the implementation of the ISM Code, there had existed strong resistance towards safety management (see also Hahne et al. 2000). The maritime personnel had felt that the requirements of the safety management system were mostly unnecessary bureaucracy (Bhattacharya, 2009; Anderson, 2003; see also a more recent study of Kongsvik et al. 2014). Bhattacharya (2009) and Antonsen (2009b) indicated that the maritime personnel often saw the requirements of the safety management as distrust towards their own competence and professional skills. Knudsen (2009) described the perceptions of the seamen as follows: safety can be ensured only by

seamanship that includes the professional touch and professional pride that have developed through a long professional hands-on experience. According to Knudsen (2009), maritime personnel perceived "*the demand for written procedures as counteracting the use of common sense, experience, and professional knowledge epitomized in the concept of seamanship."*

It was a surprise that, contrary to the previous studies, this study indicated rather positive conceptions of safety management based on the ISM Code among the maritime personnel at present. According to the interviewees, there had been some resistance to change during the introduction phase of the ISM Code, but the interviewees believed that the resistance has turned into general approval over time. Moreover, based on the results of this study, it could be said that safety management is considered essential and very beneficial among the maritime personnel. The interviews gave a fairly unanimous picture regarding their conceptions of safety management.

It also came as a surprise that the interviewees mentioned the written documentation as a key benefit of the safety management. Contrary to Knudsen (2009), this study indicated that the maritime personnel consider the documentation as a foundation - one of the cornerstones - of safety work. The interviewees underlined several benefits provided by the documentation of the safety management system. Due to the documentation, the familiarisation of new personnel and the transfer of personnel from one ship to another are much easier. The documentation helps the personnel to find the current instructions. The documentation facilitates standardisation and systematisation of the working methods. This is consistent with Kongsvik et al. (2014) who found that safety management systems have introduced a more systematic approach to safety.

Nevertheless, it seems that maritime personnel have a somewhat complicated opinion when it comes to the documentation of the safety management system. Basically, they consider written documentation as a benefit, but simultaneously they complain about its issues, such as excessive documentation and increasing bureaucracy. According to the interviewees, the major problem resulting from excessive documentation is that the instructions are not compatible with on board operations. The interviewees stated that

this undermines their commitment to and compliance with the requirements of the safety management. The interviewees indicated that safety management could be more acceptable among the maritime personnel if they were better integrated into the development process of the safety management system's documentation. A similar phenomenon has been described by Knudsen (2009) and Oltedal (2011). The results are in line with Antonsen (2009b), who concluded that incompatible documentation is likely to not be followed in real life operations.

It was also unexpected that the interviewees basically considered incident reporting beneficial and even indispensable, even though they criticised it and felt that incident reporting does not work properly in practise. Incident reporting was dealt with in every interview, more or less, and mostly the interviewees brought the issue up spontaneously. Incident reporting was introduced as one of the benefits provided by the ISM Code. The interviewees hoped that incident reporting would get improved. The interviewees pointed out several problems and reasons for poor reporting. According to them, by focusing on these reasons, improvements for incident reporting could be found. In addition, the study indicated that maritime personnel are willing to do more themselves in order to improve reporting.

6.3 Impact of the ISM Code on the maritime safety culture

The third research question was based on the belief of the "founders" of the ISM Code that the implementation of the ISM Code should result in a safety culture. The research approach to the third research question was to survey the opinions of the interviewees and find out if they feel that the implementation of the ISM Code has changed the safety culture. It has been suspected that the contribution of the ISM Code to the safety culture of the shipping industry has not been very strong. For example, Hänninen (2007) questioned the ISM Code as a remedy for the cultural defects that are related to the whole shipping industry.

According to the interviewees, the ISM Code has affected safety culture by highlighting and focusing on safety issues within the maritime industry. The introduction of the ISM Code and the related safety management systems have brought a new kind of "safety

thinking" and a better "safety awareness" into the shipping companies and on board. The interviewees considered the fact that the ISM Code requires the management of the shipping companies to commit to safety a major improvement that has partly influenced the safety thinking among the management. In addition, the study indicates that safety thinking and safety awareness have been improved among the crew due to the fact that the safety issues are discussed continuously due to, for example, regular safety trainings. It is remarkable that both the management and the personnel shared the opinion that safety thinking and safety awareness have been improved among the other group. Moreover, some interviewees literally claimed that safety culture has been improved as a result of the implementation of the ISM Code.

Other changes have also happened during the time of the ISM Code. The interviews and the observations revealed some of those changes, which are related to the social relations among the maritime personnel on board. It was indicated that the hierarchy has been lowered and the management is no longer authoritarian on board. According to the interviewees, the operation on the bridge is more team work and based on a mutual trust between the personnel. The superiors are respected due to their competence, not because of fear. The interviews and observations indicated that the open atmosphere among the ships' crew results from, for example, common premises for leisure time i.e. the mess.

Similarly, Antonsen (2009b) has described the change of social relations among the ship's crew. According to him, hierarchy is rarely found in Norwegian crews nowadays. This is of course related to general societal changes towards a more democratic working life, but is probably also related to the fact that the crew sizes have decreased dramatically in recent years. Nowadays, most supply vessel crews are characterized by a sense of being on the same boat (Antonsen, 2009b).

7 CONCLUSIONS

The functional approach has been predominant when defining and studying safety culture (Richter & Koch, 2004; Guldenmund, 2010). That also is the fact with regard to the ISM Code related studies. The functional theory presumes that an organisation's culture can be changed and manipulated, that the management is able to control and change the safety culture and that there is an ideal state that the organisation should aspire to (Richter & Koch, 2004; Reiman et al. 2008; Guldenmund, 2010). Correspondingly, when establishing the ISM Code, a strong belief existed that implementing a safety management system would result in a safety culture. In addition, the ISM Code advocates an integrated and idealist model of safety culture by providing certain commitment from the top management and certain attitudes and motivation of individuals from all levels of the organisation.

The dogma behind the ISM Code has not been challenged at all. The model of an ideal and integrated safety culture has been taken as granted and the model has been represented strongly in the previous studies regarding the impacts of the ISM Code, even though the previous studies have indicated that the implementation of the ISM Code has been only partially successful in entrenching safety culture into shipping and some disappointment exist when it comes to the impacts of the ISM Code (see for example Goulielmos & Gatzoli, 2013; Schröder-Hinrichs et al. 2015). The studies have indicated that the safety culture is seemingly differentiated between the shore based management and on the ships of the shipping companies (Grabowski et al. 2007; Goulielmos & Gatzoli, 2012; Xue at al. 2015).

Nevertheless, the approach to the first research question of this study was also more or less functional. It sought to evaluate, whether there has been any progress in relation to the three safety culture fundamentals. Based on the interviews and the observations, a conclusion can be drawn that the maritime safety culture has advanced in many aspects. The maritime personnel and the maritime inspectors did not consider the management of the shipping companies indifferent or negligent, and respectively the representatives of the management and the maritime inspectors considered that the personnel's positive

attitudes and motivation towards safety were evident. Even though on the basis of the results of this study, the safety culture seems to be closer to the ideal state, it cannot be definitely located to the high end on the continuum from good to poor (cp. Pidgeon, 1998; Wiegmann et al. 2002; Guldenmund, 2014).

Rather, the results for the first research question cannot be considered unambiguous. The results indicated obvious variation and inconsistencies within the three fundamentals of safety culture. Although the results indicated improved commitment of management and better employee participation, the results indicated some reluctant attitudes and negligence with regard to following the requirements of the ISM Code in a precise manner. Thus, the results of the first research question support the conclusion of Alvesson (2002) that the cultural manifestations are rarely in a neat order. The priority order of the values varies and the cultural ideas are unsystematic and inconsistent (Alvesson, 2002). This refers to a postmodern or constructivist view of safety culture (see for example McAuley et al. 2007 and Guldenmund, 2014), which assumes that an organisational culture is more often rather differentiated and fragmented than in harmony and sharing common values and norms.

The results for the second research question reinforce the conclusions made based on the first research question by uncovering differentiating and ambiguous elements in the interviewees' thoughts about safety management and safety culture (cp. Richter & Koch, 2004). The second research question indicated that the maritime personnel have a positive attitude towards safety management systems in general and they have gained significant benefits from the application of the ISM Code, but, for example, incident reporting and the documentation of the safety management systems raised contradictory opinions when it comes to their usefulness.

The results of the third research question indicated that the implementation of the ISM Code has affected safety culture, although it has occurred alongside changes within the social relations. Based on the opinions of the respective interview groups, the implementation of the ISM Code has increased safety awareness and safety thinking among the management of the shipping companies and among the crews on board. This

is in agreement with both the functional and the interpretive approaches, which include a presumption that the organisational culture can be affected at least to some extent (cp. Reiman et al. 2008). However, as claimed in Chapter 3.3, the postmodernist approach to organizational culture challenges not only the assumptions of the functional approach, but also the interpretive approach, which is based on, in essence, the assumption of a uniform culture and is committed to establishing a definitive understanding on the nature of organisational reality. In case of the ISM Code, it has been achieved only by a certain model of a safety culture. The postmodern approach calls for reconsideration when it comes to the dogma of a certain model behind the ISM Code, since the postmodern approach does not acknowledge any theory to be better than other theories. Due to this it would be appropriate to focus further studies on how the seemingly unavoidable differentiated and fragmented features of safety culture should be taken into account in the ISM Code related studies and in developing the possible future versions of the ISM Code.

The postmodern approach also claims that the organisational reality should be seen as contingent and temporary. This should be taken into account while drawing conclusions from this study. The results of this study indicate rather unanimous opinions among the respective interview groups and it was not easy to distinguish different interview groups based on their responses. In addition, it was not easy to distinguish the responses based on the ship types or shipping companies. The reason for that might reside in the homogenous structure of the interviewed people, who were mostly Finnish and almost all had a maritime profession as their background. In addition, most of the ships sailed under the Finnish flag during the time period when the interviews and the observations were carried out. Later on, some significant changes have happened in the shipping companies. For example, in the companies involved in this study the trend has been towards more multinational crews. In addition, Kristina Cruises has totally abandoned the shipping business. And in Neste Shipping particularly, the multiple geographies of shipping have emerged more strongly after the field survey. Neste Shipping also abandoned its shipping business. During the period from 2013 to 2015, some of the tankers were sold to a joint venture company founded by Neste, The National Emergency Supply Agency and Ilmarinen Mutual Pension Insurance Company

(Helsingin Sanomat 20.9.2013). Other tankers were out flagged to international shipping companies. At the same time, the crew members were outsourced to a Norwegian ship management company (OSM Ship Management). Thus, the results of this study could be totally different in that respect if it was renewed nowadays. Since then, there have been worries that safety could be compromised due to, for example, the fact that the crew members could be changed to international crew members, who are not familiar with the difficult navigational circumstances of the Baltic Sea (Merimies 3/2013). The worst scenario has been that an oil catastrophe could occur within the Finnish sea area (Merimies 3/2013). Nevertheless, the OSM Ship Management Company claims to be responsible for safety and it is aiming for zero incidents and zero spills (OSM, 2015). Thus one cannot automatically claim that the safety culture will be deteriorated and safety will be compromised. Because of that, it would be appropriate to focus further studies regarding the impacts of the ISM Code on the features of the multiple geographies in shipping.

Another important conclusion of this study relates to the scope of the ISM Code, which is a company. Based on the results of this study, a conclusion can be drawn that the implementation of the ISM Code has been somewhat successful in the Finnish shipping business. Yet, the reason for that may reside in the fact that the organisational environment was rather closed in the studied shipping companies during the period of the field study. One can suppose that the implementation of the ISM Code is much easier in that kind of a business environment than in an environment that is characterized by multiple geographies including management from a distance, multinational crews, diversified ownership and flag states of the ships. In addition to that, the ships may also sail all over the world. Hence, the question for the policy makers is: should the scope of the ISM Code be reconsidered? This raises also an additional new research question for further studies: how can the overall responsibility for safety that is set to a single company in the ISM Code be borne, and how should the ISM Code be modified in order to be more applicable in the diversified business environment?

Finally, one conclusion to be drawn from this study, which relates to the constructivist or postmodern approach, is the subjective nature of this study. The researcher's subjective premises can have an effect on how safety culture is understood. The researcher's premises might be politically biased and not be neutral. There is no single truth, when it comes to safety culture as a concept, and it has also been debated whether safety culture can even be studied or assessed. The reliability and validity rest on how well the researcher's conceptualisations and interpretations correspond with the conceptions of the study subjects, that is the interviewees, how thoroughly the research has been done and whether the results found and conclusions drawn are correct.

In order to understand the multiple perspectives of safety culture more comprehensively, multiple theoretical perspectives and methodological approaches are needed. This study indicates that safety culture and the impacts of the ISM Code should not be unambiguously studied using only quantitative or qualitative methods. Moreover, it is recommendable to study safety culture from several methodological and theoretical perspectives, in which way one may gain a more versatile and holistic picture of safety culture.

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APPENDIX 1 Definitions of key terminology used in this study

Accident: In incident reporting investigations and in literature, the most essential terms are accident and incident. According to Vepsäläinen and Lappalainen (2010), it does not seem that IMO, in its guidelines or codes, defines the term accident. Despite the lack of definition, this term can be found in IMO's own texts, for example in the ISM Code (IMO, 1993).

Administration means the Government of the State whose flag the ship is entitled to fly (IMO, 1993).

Classification Society is a non-governmental organization that establishes and maintains technical standards for the construction and operation of ships and offshore structures. The society validates that construction has been performed according to these standards and carries out regular surveys in order to ensure compliance with the standards. (Kristiansen, 2005).

(DP), DPA: A company should designate a person ashore to be responsible of the company's safety issues, in order to ensure the safe operation of ships and to provide a direct link between the company and those on board. The responsibility and authority of the designated person or persons should include monitoring the safety and pollution prevention aspects of the operation on each ship and ensuring that adequate resources and shore based support are provided as required. (IMO, 1993).

FMA: The Finnish Maritime Administration (Finnish Transport Safety Agency since the beginning of 2010).

Hazardous occurrence: The ISM Code urges to report and analyse non-conformities, accidents and hazardous occurrences (IMO 2002). In its publication Guidance on near-miss reporting, IMO specifies that hazardous occurrence is the same as a near-miss (IMO, 2008).

Incident Reporting: In this study, we consider that incident reporting procedures cover reports and analyses of non-conformities, accidents and hazardous situations as required by section 9 of the ISM Code (IMO 2010).

The ISM Code refers to the International Management Code for the Safe Operation of Ships and for Pollution Prevention

Safety management: the objective of safety management is to ensure that activities such as ship operations are carried out safely and efficiently (Kristiansen, 2005)

Non-conformity refers to a detected situation, in which the objective evidence shows that specified requirements (of the ISM Code) have not been fulfilled (IMO 2002).

Major non-conformity refers to a deviation which posesa threat to the safety of the employees or the vessel, or a severe risk to the environment, and requires immediate remedial action. Major non-conformity also includes the lack of systematic and effective enforcement of the ISM Code. (IMO 2002).

A near-miss case is defined as a chain of events which could have led to a loss. An actual loss is prevented only by a fortunate break in the chain of events. The unrealized loss might be, for example, an injury, environmental harm or a negative impact to business. (IMO 2008).