



CHALMERS

How New Demands Change an Organisation

A Case Study of SIRE 2.0

Master thesis for Maritime Management Program

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PREFACE

This master thesis represents 30 out of the 120 total credits of the two-year maritime management program at Chalmers University of Technology, at the Department of Mechanics and Maritime Sciences. This thesis explores how commercial driven demands in the maritime industry can contribute to increasing the legislative standards of occupational health and safety for seafarers on an international level, with special emphasis on the psychosocial work environment. This thesis will show that the human element is a vital contributor to a shipping company's business performance.

We thank all contributing participants of this interview-study and the those who helped with the pre-study familiarization of the subject. A very big thank you to our thesis supervisor Henrik Ringsberg for his time, contribution and support. Lastly, we thank our families and partners who emotionally supported and patiently waited until this thesis came to its final form.

How New Demands Change an Organisation

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SAMMANDRAG (in Swedish)

Eftersom sjöfarten är en internationell industri så är en del av rederiets ledning och organisatoriska uppgifter att navigera i de komplexa relationerna mellan kommersiella och lagstiftningsmässiga krav samtidigt som man säkerställer säkerheten för fartyg, men även för de som arbetar ombord. Ett kommersiellt exempel specifikt för tanksegmentet är Ship Inspection Report Program (SIRE), ett icke-lagstiftat krav som fartygsägare bör följa då det agerar som redarens biljett för att ingå handelsavtal med lastägare. Den andra versionen av detta program har under några års tid varit under konstruktion och förväntas inom en snar framtid att lanseras. Som additiv till den tekniska bedömningen kommer den andra versionen att inkludera den psykosociala bedömningen av ombord personal. Detta examensarbete har undersökt hur kundernas, det vill säga lastägarnas, krav inom tanksegmentet påverkar ett rederis affärsresultat och hur bedömningen av psykosociala förhållanden kan vara en del av rederiverksamheten. Denna undersökning har genomförts genom semistrukturerade intervjuer och tematisk analys av svaren från deltagare från rederiers landorganisation, ombord personal, INTERTANKO och OCIMF, där den senare är administratör och konstruktör av programmet. Resultaten visade att ur ett affärsperspektiv förväntas SIRE 2.0 inte förändra någonting eftersom det är det enda sättet genom vilket ett tankfartyg kan kontrakteras. Det förväntas dock höja industrins säkerhetsstandard eftersom den nya inspektionsprocessen syftar till att bedöma alla fartyg lika ur ett tekniskt, hårdvaru- och mänskligt perspektiv. När det gäller att bedöma psykosociala förhållanden visade resultaten att intervjudeltagarna har prioriterat människors välbefinnande kontinuerligt och SIRE 2.0-kraven för att säkerställa att den psykosociala aspekten av ombordanställda tas väl om hand kommer inte att leda till förändringar inom processer eller procedurer.

Denna uppsats är skriven på engelska.

Nyckelord: Kommersiella krav, SIRE, OCIMF, tankfartyg, risk hantering, inspektion, max 10 ord

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ABSTRACT

As shipping being an international industry, part of managing vessels is navigating the complex relations between commercial and legislative demands while ensuring the safety of the vessel but also those working on board. In the tanker segment specifically, the Ship Inspection Report Programme (SIRE) is a non-statutory requirement that ship managers should comply to as it serves as the ticket to trade. The second version of this program is underway, and apart from the technical assessment, it will incorporate the psychosocial assessment of the seafarers. This thesis has explored how customer demands in the tanker segment affect the business performance of a ship management company and how the assessment of psychosocial conditions can be part of the ship management. This has been done through semi-structured interviews and thematic analysis of the responses from the industry's shore personnel, onboard crew, INTERTANKO and OCIMF, the latter being the administrator and constructor of the program. The results showed that from a business perspective SIRE 2.0 is not expected to change anything since it is the only way through which vessels can be contracted. However, it is expected to raise the industry's safety standard as the new inspection process aims to assess all vessels equally from a technical, hardware, and human perspective. In terms of assessing psychosocial conditions, results showed that the interviewees have been prioritizing people's wellbeing all along and SIRE 2.0 requirements for ensuring that the psychosocial aspect of onboard employees are well taken care of, will not lead to procedural changes.

Key words: Commercial demands, SIRE, OCIMF, tanker vessels, risk management, inspection

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ABBREVIATION LIST

ABC	Automatisk BC
AFS	Arbetsmiljöföreskrifter om systematisk arbetsmiljöarbete (Swedish working directions regarding systematic occupational work-environment)
AML	Arbetsmiljölagen (the Swedish Work Environment Act)
BIMCO	Baltic and International Maritime Council
BoD	Board of Directors
CEO	Chief Executive Officer
CO ₂	Carbon dioxides; pollutant chemical compound
ECDIS	Electronic Chart and Display Information System
ECSA	European Community Shipowners' Associations
ETF	European Transport Workers' Federation
HDI	Human Development Index
HF	Human Factor
HFE	Humand Factor/Ergonomics
HFE	Human Factor/Ergonomics
HSQE	Health, Safety, Quality and Environment
IAPH	International Association of Ports and Harbours
ICS	International Chamber of Shipping
ILO	International Labour Organisation
IMO	International Maritime Organisation
ISGOTT	International Safety Guide for Oil Tankers and Terminals
ISM	International Safety Management
ISO	International Organization for Standardization
KPI	Key Performance Indicators
MARPOL	The International Convention for the Prevention of Pollution from Ships

MDG	Millenium Development Goals
MLC	Maritime Labour Convention, by IMO
NOx	Nitrogen oxides, pollutant chemical compound
OHAS	Occupational Health and Safety
PIF	Performance Indicator Factor
SDG	Sustainable Development Goals
SFS	Svensk Författningssamling (Swedish Code of Statutes)
SGMF	Society for Gas as Marine Fuel
SIGTTO	Society of International Gas Tanker and Terminal Operators
SIRE	Ship Inspection Report programme
SOLAS	Safety of Life at Sea, convention by IMO
SOLAS	Safety of Life at Sea, convention by IMO
SOx	Sulphur oxides; pollutant chemical compound
STCW	Standard Training and Certification for Watchkeeping, convention by IMO
TMSA	Tanker Management Self-Assessment
TQM	Total Quality Management
UNCTAD	United Nations Conference on Trade and Development
VIQ7	Vessel Inspection Questionnaire edition 7

1 Introduction

1.1 Background

Since 2012, when the Sustainable Development Goals (SDGs) replaced the Millennium Development Goals (MDGs), governments and organizations from diverse fields have been committed to build a more sustainable, safer and prosperous planet in which no one is left behind (UNDP, 2023). The SDGs offer a framework for sustainable solutions based on three pillars: environmental protection, economic viability and social equity. Governments and organizations have an array of reports and indices to measure their progress and overall performance such as the Sustainable Development Index (SDI) (Sachs et al., 2022).

In addition to the SDGs, the United Nations developed the Human Development Index (HDI) through the UN Development Programme (UNDP, 2023). The HDI was created to emphasize that, not the economy alone, but people and their capabilities should be a criterion for assessing the development of a country. The HDI concept should be applied by the industry that has the potential to make larger contributions to the three pillars of sustainable development on a national as well as international level. Hence this should be applicable by the maritime industry with special emphasis on ship management.

From a social perspective, companies that provide ship management services are responsible for their employees, including those who sail around the globe on the company's vessels (Froholdt, 2018). For example, the crew, the human capital of a shipping company, is one of the most relevant dimensions of the maritime transportation business (Popa et al., 2016). Connecting to social equity, a shipping company's human resources (HR) department is responsible for the manpower on board the commercial vessels by providing among other services of recruitment, selection, training and adjustment, and performance assessment of manpower onboard vessels. Issues that the department faces relate to the individual misalignment within the operational framework on-board the ships. Such misalignment happens because of the heterogeneity of the crew's professional, cultural, communicational, and psychosocial characteristics and often result in incidents that alter a ship's operational efficiency and effectiveness. These heterogeneous characteristics build diversity onboard which is a current popular topic within the maritime industry connected to social sustainability and teamwork effectiveness. There is a synergetic effect in well-functioning teams (Hertel, 2011) that promotes secure and healthy work environments that in return positively affects the performance and productivity of the crew.

The Sub-Committee on Human Element, Training and Watchkeeping within the International Maritime Organization (IMO) recently considered a proposition to prioritize the revision of the IMO model course 1.21 on Personal Safety and Social Responsibilities, with the aim to include specific content to establish appropriate maritime workplace behavioural norms and essential human elements of psychological safety (IMO, 2022). Relating to the proposition, the Sub-Committee identified that psychological safety, mental health and well-being (including sexual assault and sexual harassment) are topics of serious concern in the maritime segment, which requires coordinated response by relevant organisations such as International Labour Organisation (ILO) and IMO. As a response, the Sub-Committee stated the importance of inclusion of above-mentioned topics into the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), which could act as a baseline for following actions, such as revision of model courses (Shan, 2022)

Nevertheless, the most common regulations regarding the human element are those on an international level such as the STCW, the International Safety Management (ISM) Code and the International Convention for the Safety of Life at Sea (SOLAS). Other initiatives covering the human element arise from nations and cargo segments. In the tanker segment, existing demands and legislations are of higher standards (Sampson & Ellis, 2021) resulting in publications and programmes that intensify the safety and environmental performance of the marine industry. For example, the Ship Inspection Report (SIRE) programme is a tanker risk assessment tool and vessel inspection report database with the purpose of continually improving operational safety. Its new version, SIRE 2.0, includes a Human Response Tool for assessing human performance based on Performance Influencing Factors (PIFs) such as team dynamics, communications, evidence of stress, workload, fatigue, morale, motivation and nervousness (OCIMF, 2022d). The human-factor approach will assess if the shore-based management is doing enough for their onboard crew, and to see if the ship management ashore is aligned with their reported performance in the Tanker Management Self-Assessment (TMSA) (OCIMF, 2017). This new approach will make shipping companies change their mind-set regarding risk assessment, not only to follow minimum requirements but to go the extra mile in order to be a leader for sustainable shipping management, and train their crew and personnel to act and perform on sustainable terms (Jallal, 2023)

Considering the research conducted on psychosocial conditions, the expressed need for further research regarding team dynamics and psychosocial aspects on board vessels, confirms the importance of researching how to assess psychosocial (Hertel, 2011; Lefkowitz et al., 2019) The demand on communicating sustainable performances onboard has increased over the past years, with a focus on environmental performances. However, there is a lack of socioeconomic performance indicators, especially regarding team dynamics and psychosocial aspects on board vessels (Andersson et al., 2017) when such conditions can be connected with indirect costs. This leaves a gap in measuring overall sustainable performance in the shipping industry, showing that further study on the topic is needed. This study will explore how commercial, and customer driven demands can contribute to the business performance of shipping operators. Additionally, it will explore how assessment of psychosocial aspects in the occupational working environment can contribute to improved ship management.

1.2 Purpose and Research Questions

The main purpose of this thesis is to explore commercial, and customer driven demands contribute to the business performance of a ship management company. In addition to the main purpose a subsidiary purpose is to explore the assessment of psychosocial conditions (i.e., psychosocial practices), as part of the ship management. In compliance with the two stated purposes of this thesis two research questions have been formulated:

- RQ1 – How does the legislative regime regarding psychosocial aspects affect the shipping companies?
- RQ2 - How can investment and measurement of psychosocial practices be part of the business performance of a shipping company?

Additionally, this thesis was written alongside with the thesis “*Navigating the Human Factor*” by Nylund and Montenegro (2023). The purpose is to understand how the implementation of SIRE 2.0 will affect the workload of the crew. In addition, Nylund and Montenegro 2023

investigate what possible procedures, actions or measures could facilitate the transition with specific focus on the human response tool for the shipping companies that are about to do so.

1.3 Delimitations

This report targets the ship management activities within the tanker segment in the shipping industry, considering the international maritime labour law. The aim of the thesis is not to generate a guide for developing psychosocial practices for ship managers to exercise but rather to show the importance and benefits of assessing such conditions. This thesis although touching upon sustainability in ship management, lays emphasis on social sustainability.

The shipping management areas represented in this report are in Cyprus, Germany and Sweden. The job titles targeted for this report were top managers (CEO, directors) as well as middle managers (quality, compliance, superintendents, technical manager, inspectors).

The literature used for this thesis is not older than 2010 since that was when amendments to the MLC, called the Manila Amendments introduced new training requirements for seafarers on tanker vessels. The Manila Amendments required leadership skills, teamwork and distance learning as well as other.

Since shipping is an international industry, international law is first analysed. In order to analyse how international law is applied, national law is then analysed using Swedish national law as an example, which was chosen due to the high safety standards it withholds and also the range of it which includes psychosocial working environment (Sea Safety Act (2003:364)-Fartygssäkerhetslag, 2003; Arbetsmiljölagen (1977:1160), 2019).

The aim of this study is to explore opinions on changes upcoming to the tanker shipping industry, specifically changes regarding the vetting-program called SIRE. Since the changes of the program have not yet been implemented, a qualitative method is used. The choice of qualitative method was based on the fact that it provides a technique to interpret text data (Hsieh & Shannon, 2005) however still addressing quality concepts such as validity, reliability, generalizability and carefulness (Stenbacka, 2001).

For the purpose of this thesis a case study (Hollweck, 2016; Robert, 2009) is conducted focusing on the changes that SIRE 2.0 is bringing to the industry. Specifically, the thesis looks only into what the change means for the management side of shipping. However, it should be noted that SIRE 2.0 has not yet been implemented and it is not the thesis intention to evaluate SIRE 2.0 from the inspector's point of view or criticise the new inspection regime.

Vessel Inspection Questionnaire 7 (VIQ7) is the current existing questionnaire taken out by OCIMF for inspectors to use when assessing the vessel taken under the current vessel inspection program called SIRE. Since the new SIRE 2.0 has not yet been fully implemented, a comparison was conducted on the previous program's questionnaire called VIQ7 to understand the differences between the old program version and the changes made in the SIRE 2.0.

The thesis's design is a single case study with an abductive research approach. Although the abductive approach requires a continuous cycle of gathering empirical data, reviewing literature, and building on theory (Dubois & Gadde, 2002), this thesis was completed using only a single cycle of this process.

The thesis's unit of analysis concerns policy makers, onshore compliant and onboard compliant with regard to the deck department. The thesis does not represent perspectives from the engine department since only deck ratings were interviewed.

This report will not elaborate on the United Nation's Sustainable Development Goals (SDG's) since it is out of the scope of this study. However, they are mentioned due to their importance when discussing corporate social responsibility and socioeconomic aspects (Psaraftis, 2019).

2 Theory

This chapter provides theoretical foundation and context for the research by outlining the key concepts, theories, and existing research relevant to the topic of the thesis.

2.1 Economic Growth within Trade of Oil and Gas

The seaborne transportation of goods (also known as shipping) between geographical points has become a highly globalized industry (Chen et al., 2018). Sea transport plays a crucial role in meeting the demand for economic growth, with shipping intensity serving as an important measure of its use in specific economic sectors (Lun et al., 2010), since consumer markets do not always overlap with producing regions (Langdana & Murphy, 2014).

The movement of cargo by sea transport is a result of trade with the consignor selling commodities to the consignee (Lun et al., 2010). Three-fourth of the global cargo flow is subject to seaborne trade (Lun et al., 2010). In 2021, the volume of global seaborne trade reached 11 billion tons (UNCTAD, 2022b). According to Eurostat in the same year the maritime transport accounted for about 68% of freight transport performed in the European Union alone (Eurostat, 2023).

Oil and gas are heavily traded goods and along with pipelines the most common mode of transporting crude oil, oil products and natural gas is via tanker ships (Jia, 2018; G. Wang et al., 2022). In 2021, the volume of crude oil in seaborne trade reached 1.8 billion metric tons (VSM, 2022), having China as the highest importer of oil and its products with 12 million daily barrels (BP, 2022b) However, Europe has imported 13.5 million barrels per day placing it ahead of China on a statistical level (BP, 2022b). Region-wise the Middle East exports oil the most with records showing 14 million barrels per day in 2021 (BP, 2022a). The second largest exporter was the Asia Pacific region with roughly half the number of what countries in the Middle East are exporting. The number of barrels that Russia produced (8,23 barrels per day in 2021) had been considered stable while petroleum exports from the US have almost quadrupled since 2010 (BGR, 2020). Despite a slight decline in oil demand in 2020 due to the pandemic, records show that the demand is rising. Specifically looking towards 2026 the demand is expected to reach 104.1 million barrels per day. For 2021, 8,883 oil tankers have been registered worldwide but BIMCO report states a limited fleet growth due to a combination of declined supply and reduction in sailing speeds of 2-3% as per decarbonization regulations (Rasmussen, 2023)

In addition to oil, gas is another important commodity within the energy industry, and which is transported via tankers. Overall, 516 billion cubic meters were transported in 2021 (BP, 2022e) having China, Japan and South Korea as the leading importing countries of Liquefied Natural Gas (LNG) in 2021 with 109.5, 101.3 and 64.1 billion cubic meters respectively (BP, 2022d). In the same year Australia has exported the most with an export volume of 108 billion cubic meters followed by Qatar with 106.8 billion cubic meters (BP, 2022c).

At the end of 2021 the global LNG tanker fleet consisted of 700 vessels (GIIGNL, 2022). Global demands are expected to reach 450 million metric tons by 2025 and consequently the number of LNG tankers are expected to increase as well (Morgan, 2019).

2.2 Shipping Business

Shipping business is an economic sector driven by the freight rate mechanism. The essence of this business is the transportation of cargoes from an area of supply to an area of demand which consequently result in the need of seaborne trade (Lun et al., 2010) as part of the transport

system (Mariotti, 2014). Shipping is an immense complex socio-technical system that employs technologies and solutions for transporting cargo. The complexity of the system is a consequence of the interactions between social, economic, political, legal and environmental dimensions which in turn influence the system's components (Auvinen & Tuominen, 2014; Y. Lun et al., 2010)

- Infrastructure i.e., ports and terminals.
- Vehicles i.e., ships that use the infrastructure to move the cargo
- Users as the organizations that ensure that vehicles and infrastructure have been utilised in an effective and efficient manner
- Management component that accounts for the governance and regulatory compliance of the transport system.

Like any other type of organization, shipping companies are in the business of capital creation (Watson et al., 2021). This happens by moving the products from the supplier to whoever demands the cargo. From a holistic perspective the companies that survive are those that utilize the capital in the best possible way and is far more productive than its competitors (Watson et al., 2021). In his work Watson et al. (2021) has classified six types of capital:

1. Natural - Natural resources, living systems, and ecosystem services
2. Economic - Financial, physical, and manufactured resources
3. Human - Skills, knowledge, and abilities of an individual that can be used to generate income or other useful outputs
4. Organisational - Institutionalised knowledge and codifies experience stored in databases, routines, patents, manuals, structures, etc.: essentially, the knowledge, skills and information that stays behind when an organisation's people go home at night
5. Social - The ability of an individual or group to benefit from their social connections; includes structural, cognitive, and relational dimensions
6. Symbolic - The amount of honour or prestige possessed within a given social structure; includes aspects such as reputation, legitimacy, authority, status, and rank

The capital creation of a ship management company takes place in a constant changing and complex environment (Akpinar & Ozer-Caylan, 2022; Watson et al., 2021).

2.2.1 Shipping as a Complex System

In complex systems time is a critical dimension. Scientists or system theorists distinguish between stationary and non-stationary systems. In the former the parameters of process which determine the interactions among the variable, are invariant e.g., do not change over time. In contrast non-stationary systems change over time due to for example time i.e., aging, function or prior activity i.e., learning, or function of context i.e., situation dynamics (Flach, 2012) The author starts that in a circular coupling, all components (such as perception and action) function as both causes and effects simultaneously. The variables within the circular coupling mutually influence and are influenced by the behaviour of all other variables in the circle (Flach, 2012)

The business environment in which a ship management organization operates is uncertain and cyclical. This creates a complex environment which is a threat to organizational survival (Akpinar & Ozer-Caylan, 2022). Giannakopoulou et al., (2015) stated that corporate governance enhances strategic decisions, addresses concerns and interests of stakeholder and

ultimately raises and takes care of the welfare of the stakeholders. Any corporate governance model consists of legal, organization and cultural procedures which impact the way an organization is controlled, thus making governance a determinant for operational and financial performance of the organization. The authors also argue that there is a positive relationship between the adoption of internal corporate governance practices and financial performance.

2.2.2 Ship Management

The science of management has been covered by an increased amount of scientific work and although some managerial concepts are applicable in the shipping industry, managing ships is considered more challenging as the dimensions of the system mentioned previously are dynamic and constantly changing (Panayides, 2019). In his book, Panayides (2019) describes the primary rule for the companies as the accumulation of a resource base that is allocated internally so that the goals are achieved. For example, people who are a key resource should be organised into departments and teams to achieve defined organisational objectives that relate to customer satisfaction and business performance. In addition, he states that managers are in charge of developing business value propositions to gain the interest of customers and therefore higher market share. This means that depending on the customer a company develops different value propositions (Lussier, 2018). For example, a customer in liner shipping values more freight costs, shipping punctuality and reliability whereas customers in the wet bulk (i.e., oil majors) have a higher focus on safety, the environment, the image and the reputation.

On the other hand, ship owners (another kind of customer for the shipping companies) are looking into asset preservation, earning period maximisation and operational reliability that ship managers provide (Panayides, 2019). Internal and external implications such as environmental and regulatory requires the companies to have strategic intent. The author points out that a company sets strategies on a corporate and business. While former entails decisions on what business the company should be in, some of which can be investing in strategic business units, mergers and acquisitions, alliances, joint ventures, diversification and divestiture, and mode of exit, maintaining competitive advantage, deciding which market to enter, who is the target-customer and how to differentiate from competitors are decisions considered in the business strategy (Alexandridis & Singh, 2016).

2.2.3 Managing Tanker Vessels

Managerial decisions in the tanker shipping market are linked with the oil and gas market (Panayides, 2019). In the tanker shipping market, the competition is high because of the numerous ship-owners, the transparency regarding freight rates and the high need of compliance with laws and regulations as well as economic factors that influence the capital utilisation e.g., the high investment required for acquiring a vessel (Lun et al., 2013; Lyridis & Zacharioudakis, 2012). Tanker operations are adjusted to the fluctuations of supply and demand and in terms of logistics the cargo management is much simpler (P. M. Panayides, 2019). This is shown in the United Nations Conference on Trade and Development (UNCTAD) of 2022 which states that liquid bulk carriers had a 0.98 day turnaround in port (UNCTAD, 2022a). Two key management issues of tanker companies are vetting requirements and key performance indicators (Panayides, 2019). In the tanker segment the virtue lies in safety which is an area where charterers show high interest (Bloor et al., 2013).

2.2.4 Tracking Management Performance

Measuring performance entails examining processes and strategies of the organization to assess if the outcomes align with the desired results (Panayides, 2019). To do so a company may adopt a top-down approach e.g., the strategy of the company is the bases for developing the performance management system, or a bottom-up approach whereas performance is translated to managing operational performance through operational Key Performance Indicators (KPIs). A key performance indicator (KPI) is a quantifiable metric that serves as concise measure that specifically targets the performance aspects essential for realizing the company's strategy and, consequently, achieving organizational objectives (Parmenter, 2015). KPIs consist of specific data utilized for measuring and evaluating performance (Konsta & Plomaritou, 2012). As the authors state, these indicators should encompass economic, commercial, technical, operational, and societal measures, both at a micro and macro level.

For the tanker ship managers establishing KPIs is critical due to the competitive nature of the market (Panayides, 2019) Despite the common use of KPIs to monitor the outcomes of the adopted strategies, tanker shipping companies benchmark their performance within the market (Konsta & Plomaritou, 2012). Another way in which KPIs are applied within the tanker company is to evaluate its safety management system (SMS) and ensure compliance with the Tanker Management and Self-Assessment (TMSA) programme with which the companies measure and improve their SMS (Panayides, 2019). As the author explains, the program provides certain KPIs that tanker companies are being benchmarked against. In this way reports from various companies are used to circulate best practices industry-wise and therefore raising the safety standard of the industry.

2.2.5 Managing Safety, Quality and Change

The International Safety Management Code (ISM) was made mandatory in 1998 and requires from ship managers a Safety Management System (SMS) providing thus an international standard for the safe management and operation of ships and pollution prevention (IMO, 2014). This mandate requirement indicates that safety is a major topic of interest in the maritime sector (Karakasnaki et al., 2018), not only because of the risk of environmental pollution (Moldanová et al., 2022) but also because of shipping as a high-risk occupation (Baygi et al., 2022).

Considering that the SMS is a core system for ship management, the quality of the processes is a critical factor in the effectiveness of the system (Mitra, 2016). Quality in service industries is crucial and contributes to customer satisfaction and retention (Thai et al., 2014). Companies implement Total Quality Management (TQM) which is a management approach taken by an organization centred on quality by including all of its members and aiming at long-term success through customer satisfaction and actions in the interest of the company's members and the society (Harrington et al., 2012). Alongside TQM, ISO 9001 is a voluntary tool for ensuring quality in an organization by providing the basic requirements that an organization must fulfil for developing a quality management system (ISO, 2015; Pantouvakis & Karakasnaki, 2016). In their work Pantouvakis & Karakasnaki (2016) explain that both ISO and ISM code are designed for promoting a structural, formalized, systematic and process-oriented management of the company's operations. They continue by pointing out that this management approach is achieved through process documentation, encouraging a formal and hierarchic organizational structure, process control and coordination as well as compliance with mandatory rules, reporting non-conformities and promoting continuous improvement initiatives.

One of the goals of the ISO standard on quality management is to strengthen the requirements for addressing changes to the quality management system of a company and its processes (Rusjan & Alič, 2010). In doing so companies should understand the requirements of change, the criteria and the impact scale (Franklin, 2014). It is the company's responsibility in leading change to ensure that the level of change will not cause disruption which might negatively affect the normal business operations.

2.2.6 Human Factor and Ergonomics in Ship Management

Human Factors (HF) relates to the people's interaction with workspace and other individual or a group of people (Loureiro et al., 2015). Adding to that the International Labour Organization defines "ergonomics" as the study or measurement of work and incorporates all activities whereby a rational human operator systematically pursues an objective (ILO, 2023; Niu, 2010). Human Factors / Ergonomics (HFE) combines three fundamental characteristics; it takes a systems approach, is design driven and focuses on performance and well-being which are interrelated outcomes (Dul et al., 2012). HFE targets systems that allow the interaction between humans and the environment. The authors mention that the environment is characterised by its complexity and consists of touchable artefacts, the processes, activities and control as well as people and culture, comprising thus a physical, organisational and social environment (Dul et al., 2012).

Given that every individual has different behaviour and understanding, dealing with complexity, pressure, workload and difficulty of the daily routine on board a vessel is not considered as an easy task. The fact that seafaring is a hazardous occupation explains the focus on physical ergonomics and occupational health issues (Österman et al., 2010): Accidents, injuries and sick leaves as well as the appropriate insurance are considered direct operational costs of a business which affect the overall financial outcome (Patrick Neumann & Dul, 2010; Tompa et al., 2021). This implies that a shipping company has to consider occupational accidents and compensated sick-leaves when budgeting and pay when such occur. Indirect costs occur when employees underperform because of strenuous working conditions and these are greater than visible, direct costs (Österman, 2012; Rose et al., 2013). This is because indirect costs are not identified with a given cost object in an economically feasible way but are necessary for the overall operation and performance of activities (Horngren et al., 2013).

2.2.7 Outsourcing of Human Resources

Companies which consider that Human Resources Management is not a core process usually regard their crews as an item of cost. Obviously, in this case, what is sought is the outsourcing of a part or of the whole of the processes of the Human Resources Management of the ships, either to independent ship management companies or to crewing agents, and the selection of seafarers from the competitive maritime labour market, whose employment permits a reduction in payroll cost (Bloor et al., 2014). Such an approach, which is of a short-term character, frequently gives rise to objective weaknesses in the organic integration of these seafarers into the Human Resources Management of the company, weaknesses which are likely to undermine the team's spirit and dynamic. A company's ships may have the most perfect systems and be supported by similar systems on land, but they only operate effectively if they are manned by capable and satisfied human resources (Theotokas, 2018).

Apart from monetary benefits i.e., salary, there are other factors that contribute to superior performance. Seafarers wish to feel that the company's management and their colleagues in the offices recognise what they do, appreciate them and take their opinion into account. Individuals

are interested in the outflows (remuneration), but they are equally interested in the process which generate these outflows and wish to know that their opinion is listened to, even if it is not adopted. It has been established that managers who believe that the company's processes are fair show high levels of trust and commitment, and, consequently, provide their collaboration willingly (Chrystanto et al., 2019). This leads to the conclusion that individuals are likely to trust the systems and to collaborate without reservations when they are aware that the processes are fair, regardless of whether they themselves lose or gain by them (Theotokas, 2018). For reasons which have been explained previously, the employment of low-cost seafarers has been combined with the outsourcing of the processes of Human Resources Management dealing with these seafarers, thus contributing to a reduction of payroll cost for companies but giving rise to a series of particularities and problems of an operational character.

2.3 Governance and Regulatory Compliance

Roe (2015), presents the maritime governance framework as a static framework which is based upon anachronistic institutional structure dominated by commercial and traditional self-interests rather than those of society. In his work Roe (2015) addresses the issues of having static rather than dynamic measures and suggests that instead of being fixated on a form, policy-making should be flexible and thus adaptable to change. Especially because as a global industry the maritime and therefore the shipping industry is subject to constant change (Roe, 2015).

From a regulatory perspective, although some level of regulation complexity is necessary (Gai et al., 2019) the complexity of norms erodes economic efficiency because of the quantity, linguistic and relational approach to complexity (de Lucio & Mora-Sanguinetti, 2022). As the authors stated the latter approach to complexity derives from the connection between norms and how these reference to each other.

Bloor et al., (2013) presents the shipping industry as “a valuable natural laboratory for the study of patterns of compliance and governance” and characterizes it as fragment, complex, multi-level and overlapping. In their work the authors demonstrate how ship's operator's compliance relate to instrumental compliance, normative compliance, taken for granted compliance and corporate policies of vessel governance. Bloor et al., (2013) argue that shipping is a highly segmented industry whose corporate culture encompasses compliance with international regulations. According to them ship operators believe that compliance with the correct course of action is followed automatically. This is believed to be an outcome of corporate exposure to frequent inspections and associated enforcement activity. Bloor et al., (2013) mentions SIRE as the critical inspection regime in the oil tanker sector which is also the case study of this thesis. The authors continue by stating that deficiencies on inspections lead to financial and reputational losses. In addition, a conditional compliance regards the willingness to comply which translates into “the desire of a level playing field”. This implies that no “free riders” should gain a competitive advantage by non-compliance and consequently reduce freight rates by unfair competition (Bloor et al., 2013). A “level playing field” means that good organizations operate under reasonable oversight and in contrast the rest will be forced to change before proceeding with operations (Carpenter et al., 2021).

From corporate perspective Bloor et al., (2013) express that in addition to conditional compliance companies are driven by the negative consequences of “being named-and-shamed as non-compliant” and any diversion of this “culture of compliance” as it is characterized, leads to sanctions. Moreover, part of a corporate compliance behaviour is to deliberately follow additional norms for the sake of society's expectations. Bloor et al., (2013) study concludes with variations in compliance (geographical, regulatory, and sectorial) and their association

with evolutionary governance practices such as that of the oil majors' SIRE inspection in the tanker sector (Bloor et al., 2013).

2.4 Statutory and non-statutory requirements on occupational health and safety

A framework, the Maritime Social Responsibility framework for analysis of impact of legislatives and recommendations was published by Ringsberg and Cole (2020). The framework presents four different levels of compliance, starting with the national level complying with flag state regulations, followed by three international levels which are described in the subsections below. Each level connects to the previous and forms the foundation of how to structure statutory and non-statutory requirements.

2.4.1 National level

The first level of the framework describes the national compliance level. On the national level, the Flag State is ratifying international conventions and adapting them into the Flag State's laws and regulations. Ratification means that a member state undertakes to follow a convention, and it should normally be ensured that the Flag State law is in accordance with the convention before it is ratified (Adascalite, 2022). Both in terms of conventions and recommendations, the ILO committee can provide views on whether any measures should be taken in relation to the instrument. If it is necessary to take measures through legislation, however, it is not enough that the issue is dealt with within the ILO Committee. Additional preparation materials are then needed, which can be produced, e.g., by adding a special investigation (International Labour Organisation, 2006).

According to Swedish law, in "Statens offentliga utredningar" (SOU 2021.86) from 2021, each state is obliged to report to the ILO on measures taken to fulfil its obligations under ratified conventions. The working conditions must be adapted to people's different conditions in physical and psychological terms (AML, 1977). The provision means that consideration must be given to individual differences in terms of physical and mental stress in the work environments where work is carried out. The requirement therefore entails an obligation to adapt to work for the employees and means that e.g., technical devices, work methods and work tools must be chosen based on that requirement. Psychological and social conditions at work must also be taken into account. The employee must be given the opportunity to participate in the design of his own work situation as well as in change and development work related to his own work. Monotony, stress and isolation at work must be avoided by adapting working conditions to the employees. Technology, work organisation and work content must be designed so that the employee is not exposed to physical or mental stress that could lead to ill health or accidents. Pay forms and the arrangement of working hours must be taken into account, and strongly controlled or tied work must be avoided or limited (AML, 1977).

Social work environment refers to conditions and prerequisites for work that include social interaction, cooperation and social support from managers and colleagues (AFS, 2015). The Swedish Work Environment Authority states that the organizational work and social environment provisions are not applicable in relation to third parties but must only be applied to internal organizational and social conditions (AFS, 2015). The provisions regulate knowledge requirements, goals, workloads, working hours and victimization.

The general aspect of what is stated in the Swedish working environmental law is that the employer is responsible for the employees wellness, regarding both physical and psychological well-being (AML, 1997) It is the employer's responsibility to ensure that effective procedures

are carried out to qualify the working environment and ensure that the working environment are aligned with prescribed demands (SFS, 2010; SFS, 1977). However, Fartygssäkerhetslagen (2003) (ch.4 §9) says that what is stated in the Arbetsmiljölagen (1977:1160) 3 kap. 2 §, 2 a § first and second paragraph, and 3§, regarding the responsibility of the employer for an employee's illness and accident, should equally be applicable to the master when conducting work onboard. This implies that there should be accessible means and tools proposed to the captain to assure this.

2.4.2 First international level

The first international level of the presented framework (Ringsberg & Cole, 2020) comprises international regulations, where regulation and directives are addressed. One of such directives is the Council Directive 2009/13/EC of 16 February 2009 implementing the Agreement concluded by the European Community Shipowners' Associations (ECSA) and the European Transport Workers' Federation (ETF) on the Maritime Labour Convention, 2006, and amending Directive 1999/63/EC (European Union, 2009) highlights ILO's implementation of the Maritime Labour Convention on 23rd of February 2006 (. This Directive implements the Agreement on Maritime Labour Convention, 2006, concluded on 19 May 2008 between the organizations representing management and labour in the maritime transport sector (European Community Shipowners' Associations, ECSA and European Transport Workers' Federation, ETF). The Directive is divided into eight articles describing the changes made to the previous Council Directive 1999/63/EC. Article 2 enlarges the amendments made, where clauses 6 and 13 are directly revised in accordance with what is stated in the STCW-code. Other EU-directives in correlation to occupational health and safety:

- Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work (Colosio et al., 2017)
- Directive 2006/15/EC establishing a second list of indicative occupational exposure limit values in implementation of Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC
- Commission Regulation (EU) No 428/2010 implementing Article 14 of Directive 2009/16/EC as regards expanded inspections of ships.
- Commission Recommendation of 19 September 2003 concerning the European schedule of occupational diseases
- Directive 1999/63/EC concerning the Agreement on the organisation of working time of seafarers concluded by the European Community Shipowners' Association (ECSA) and the Federation of Transport Workers' Unions in the European Union (FST) Annex: European Agreement on the organisation of working time of seafarers
- Directive 94/33/EC on the protection of young people at work
- Directive 92/29/EEC on the minimum health and safety requirements for improved medical treatment on board vessels
- Directive 91/383/EEC supplementing the measures to encourage improvements in the health and safety at work of workers with a fixed-duration employment relationship or a temporary employment relationship
- Directive 96/98/EC of on marine equipment

At the EU level, impact assessments are carried out on initiatives expected to have significant economic, social or environmental impacts (Jain et al., 2012). These initiatives can be legislative motions, non-senatorial initiatives, i.e., recommendations for the negotiations of international agreements, or implementing and delegated acts. At the national level the requirement to carry out impact assessments varies. Occupational impact assessment has its baseline of compliance in the national occupational laws and international standardized guidelines (Jain, et. al., 2012). In some European countries, occupational health surveillance is provided to all workers by law, while in other European countries only selected subgroups have access (Colosio et al., 2017). This implies that there is a need for harmonized information systems, and in accordance with the Directive, assessment of the practical implementation of occupational health and safety surveillance (Colosio et al., 2017).

2.4.3 Second international level

The second international level of the presented framework (Ringsberg & Cole, 2020) exists to provide non-statutory guidance to stakeholders in their regulatory compliance with risk management guidelines on the third international level (Ringsberg & Cole, 2020).

ISO 31000:2018 (risk management) provides guidelines on managing risk faced by any type of organisations. The application of these guidelines can be customised to any organisation and its context. ISO 31000:2018 can be used throughout the life of the organisation and can be applied to any activity, including decision-making at all levels (International Organization for Standardization, 2018).

ISO 45001:2018 (occupational health and safety management systems) specifies requirements for an occupational health and safety (OH&S) management system, and gives guidance for its use, to enable organisations to provide safe and healthy workplaces by preventing work-related injury and ill health, as well as by proactively improving its OH&S performance (International Organization for Standardization, 2018).

ISO 26000:2010 (social responsibility) provides guidance to those who recognize that respect for society and environment is a critical success factor. As well as being the “right thing” to do, application of ISO 26000 is increasingly viewed as a way of assessing an organisation’s commitment to sustainability and its overall performance (International Organization for Standardization, 2010). Literature shows that companies with mature ERM processes withhold greater operational performance than those with less mature risk management processes (Callahan et al., 2017). Furthermore, the study conducted by Callahan et al., shows support for the linkage between cooperations adapting to a more mature ERM, and the enhanced operational improvement of the organisation as a whole. However, ERM programmes requires a large number of resources in order to continuously monitor and adjust the programme to be able to cope with potential risks facing the organisation (Barton et al., 2012). Barton et al., 2012 states the importance of a thorough risk assessment and for the management not to base the decision making upon positive historical performances and lack of preceding compelling events.

2.4.4 Third international level

The third level of the framework refers to legislative on international level (Ringsberg & Cole, 2020) The International Maritime Organization (IMO) is a specialised agency with responsibility for the safety and security of shipping (Hendriksen, 2022). The IMO acts towards the prevention of marine and atmospheric pollution by ships, acting directly under the United Nations, where the work of the IMO supports the UN sustainable development goals (International Maritime Organization, 2019 (Sciberras & Silva, 2019). As an international

industry, shipping can only operate effectively if the regulations and standards are themselves agreed, adopted and implemented on an international basis (Guerva & Dalaklis, 2021). IMO acts as the forum at which this process takes place. One of their conventions is the STCW-95 convention concerning standardised training and certification of watchkeeping for seafarers (STCW-convention, 1995). The Flag State is in most conventions the primary responsible for implementing conventions in regard to its own vessels and their personnel. The IMO itself does not have the power to enforce conventions, however, IMO has been given the authority to quality assure the training, examination and certification procedures of Contracting Parties to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978 (International Maritime Organization, 2019). This was one of the most important changes made in the 1995 amendments to the Convention which was enforced on 1 February 1997 (STCW-convention 95, IMO).

The enforcement means that governments have to provide relevant information to IMO's Maritime Safety Committee which will reconsider whether or not the flag state concerned meets the requirements of the Convention (International Maritime Organization, 2019). Liquefied bulk tanker vessels are required to fulfil certain approvals stated by the chartered oil company (ISGOTT 6, 2020; Zhai et. al., 2019). These approvals are fulfilled by the vessel during the vetting procedure, which is conducted by a vetting inspector, upon the oil company's request. During this procedure an amount of vessel-specific and cargo-specific statements is used as baseline for confirming that the vessel is performing as appropriate. The statements and requirements needed to get an approval are based on regulations stated in SOLAS (Safety of Life at Sea), focusing on basic standard safety requirements needed for specific vessel types, STCW (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers) focusing on standard requirements when it comes to education of seafarers and their certification in relation to demands depending on vessel type, and other regulations relating to the tanker segment, and what is stated in the ISM-code (Kilpatrick & Richard, 2022; Knapp, Bijwaard & Heij, 2011).

The STCW-convention was first adopted in 1978 and entered into force in 1984. It contains basic regulations and requirements on standards, certification and watchkeeping demanded for international seafarers (STCW-convention, 1984; Martes, 2020). The convention is supported by the STCW-code, in which the basic requirements are enlarged and explained more in detail. The STCW-code is divided into two parts, A and B.

Part A of the Code is mandatory. It provides in detail the minimum standards of competence required for seagoing personnel in a series of tables, and are divided into following chapters:

- Chapter I: General provisions
- Chapter II: Master and deck department
- Chapter III: Engine department
- Chapter IV: Radiocommunication and radio personnel
- Chapter V: Special training requirements for personnel on certain types of ships
- Chapter VI: Emergency, occupational safety, medical care and survival functions
- Chapter VII: Alternative certification
- Chapter VIII: Watchkeeping

Part B of the Code contains recommended guidance which is intended to help member parties implement the Convention. The recommendations are not mandatory, and the given examples are only intended to illustrate how certain requirements in the Convention may be complied with. However, the general representation of the recommendations emphasises an approach that

has been balanced by discussions within IMO and consultation with other international organisations (STCW-convention, 1984).

Due to new upcoming requirements regarding training of seafarers, the Convention is a living document, and revised continuously. The revisions and amendments are carefully revised and confirmed by the Maritime Safety Committee (MSC) within IMO. Two of the major revisions of the Code were performed in 1995 and 2010. The first major revision was the 1994 amendments on special training requirements for personnel on tanker vessels, which were adopted by resolution MSC.33(63) and entered into force on 1 January 1996 (STCW-convention 1996). The second major revision to the Convention and Code was the 2010 amendments, also called The Manila Amendments. They were adopted by resolutions 1 and 2, respectively, by a Conference of Parties to the STCW Convention, held in Manila, Philippines, from 21 to 25 June 2010 (2010 STCW Conference). The amendments mainly introduced new requirements regarding certification requirements, revised requirements on working and rest hours, distance learning, training in modern technology, marine environmental awareness training, training in leadership and teamwork, enforced regulations on medical standards, updating of competence requirements regarding all types of tanker vessels, and introducing refresher basic training module every fifth year on personal survival techniques and fire prevention (The Manila Amendments STCW-convention, 2010; Evans et al., 2017).

The latest amendment was the 2015 amendments, which were adopted by resolutions MSC.396(95) and MSC.397(95). The amendments updated chapter I (General provisions), regulations I/1 and I/2, chapter V (Special training requirements for personnel on certain types of ships) and introduced new section V/3 on training requirements for personnel on ships subject to the IGF Code, in the STCW Code, and entered into force on 1 January 2017 (STCW-convention, 2015). [OBJ]

International Labor Organisation

The International Labor Organization (ILO) was established in 1919 with the aim of promoting social justice to achieve lasting peace (International Labour Organization, 2016). The ILO's fundamental goals are to fight poverty and promote social justice by promoting employment and better working conditions throughout the world, and to safeguard freedom of association and the right to collective bargaining. Sweden became a member in 1920 through its accession to the League of Nations. Since 1946, the organisation has been the UN's specialist body for employment and working life issues. The organisation has 187 member states. What is unique about the ILO is that the organisation is based on tripartism, which means that representatives of the governments of the member states as well as representatives of employers and workers in each member state participate in the work and decision-making.

A special position within the ILO is held by the eight so-called the Core conventions concerning forced labour, child labour, the right of association and organisation, and discrimination. They are considered to reflect fundamental rights and principles within the ILO that are binding regardless of whether the conventions in question have been ratified by member states (International Labour Organisation, 1998).

Maritime Labour Convention

The Maritime Labour Convention (MLC) is a convention adopted by the International Labor Office (ILO) in 2006 and entered into force on 20 August 2013. The MLC deals with seafarers' rights to decent working and living conditions. (International Labour Organisation, 2006). In the convention, the rights of maritime personnel are established globally. The MLC, 2006, is considered the fourth pillar of the international regulatory regime for quality shipping,

complementing three key IMO treaties on safety of life at sea (SOLAS), training of seafarers (STCW) and marine pollution prevention, (MARPOL). The MLC, 2006 lays out requirements for payment of wages, leave, repatriation and medical care of seafarers, creating regulatory obligations for States, ship owners and operators (Maritime Labour Convention, 2013). In Sweden, there are, for the most part, corresponding provisions in existing laws, ordinances and regulations as well as through the collective agreements of the labour market partners (Swedish Transport Agency, 2019). All vessels except fishing vessels and naval vessels and with a gross tonnage of 200 and above and which operate in traffic area A-C (Vänern and Kalmar Sound excepted) are covered by the MLC-convention. All ships whose gross tonnage is at least 500 or more and which engage in international traffic or which operate in the internal waterways of another country are covered by the convention and must hold a certificate as proof that they meet the requirements of the convention (Swedish Transport Agency, 2019).

In 2022, new amendments were introduced to the MLC-convention. In the 32nd session of the IMO Assembly, a new specific strategic direction on the human element in the current Strategic Plan for IMO was included. Advocating the work on the human element, is the intensified partnership with UN sister agencies that has evolved in the approval by the ILO Governing Body, and the endorsement by the IMO Council, of a Joint ILO/IMO Working Group to identify and address seafarers' issues and the human element in areas of common interest to both organizations (Pallotta et al., 2022). Such human elements involve, but are not limited to social isolation, fatigue and loneliness, which causes mental disorders in seafarers (Pallotta et al., 2022). According to Buscema et al., (2023), there is a lack of interest in further assessing psychosocial risks and where legal protections and controls performed at the time of seafarer's recruitment are not enough to restrain the problem (Pallotta et al., 2022).

Working onboard a vessel indicates that also leisure and resting time will be conducted onboard. Due to the hostile nature of the workplace, the work conducted onboard must be in balance with seafarers' health and safety protection (Rodríguez et al., 2012; Uğurlu, 2016). Rodríguez et al., (2012) therefore claims that qualified international organizations hold the responsibility to unite on legislative matters concerning the particular characteristics of onboard work (Rodríguez et al., 2012). However, Rodríguez continues stating that this necessary and fair legal overprotection facilitating the gap between maritime occupational health and safety prevention and protection between different working places, such as working onboard a vessel and working ashore, does not exist in current international legal instruments. The authors follow up by stating that actions need to be investigated and undertaken in order to guarantee the right protection of maritime occupational health and safety due to its importance to the world economy (Rodríguez et al., 2012).

2.5 General guidelines, Risk management and Risk Assessment-

Risks can be described as the combination of the probability of an event and its consequence, where consequences can range from positive to negative (Lemos, 2020). When mentioning risk in a health and safety- aspect, risks are defined as the uncertainty of an event occurring that could have an impact on the achievement of the objectives, where it is measured in terms of consequences and likelihood (Ahmad Shukri & Isa, 2021). The authors describe risk assessment as a tool to help an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes.

Risk management can be described as the process of identifying, assessing and controlling financial, strategic, operational, legal and security risks towards the company's capitals and earnings (Hopkin, 2018), where the risk assessment is the tool used to assess the likelihood and

the magnitude of the potential consequences of the activity assessed (Hopkin, 2018). The International Organisation of Standardisation (ISO) has published guidelines corresponding to risk management and occupational health and safety management systems in order for companies to be ISO-certified. Some of the guidelines provided are regarding social responsibility, correlating to sustainability and companies' overall performance. Some of the ISO standards are regarding work related risk management and corporate social responsibility are ISO 31000:2018 (risk management), ISO 45001:2018 (occupational health and safety management systems), and ISO 26000:2010 (social responsibility) (Hemphill, 2013). Other frameworks can be used to identify and deal with risks concerning the corporate aspect, such as the COSO Enterprise Risk Management Framework (Callahan & Soileau, 2017; Karanja, 2017)

2.5.1 Risk assessment in shipping

Shipping transportation safety is closely related to the occupational safety onboard the vessels (Chrystanto et al., 2019). The operations in the shipping industry are dominated by a series of regulations that are mandatory for all shipping companies and aim at increasing the safety and quality standards in the maritime sector in order to ensure safe and efficient transportation of goods (Pantouvakis & Karakasnaki, 2018). Shipping safety involves the implementation of international as well as national regulations with aim to decrease the risk to humans, property, and the environment (Sait et al., 2020). The International Safety Management (ISM) Code was finally designed for ensuring the safe operations of ships, as well as pollution prevention (IMO, 1993).

International Safety Management (ISM) Code

The ISM Code in its current form was adopted in 1993 by resolution A.741(18). The ISM-code became mandatory by being adopted by the 1994 amendments to the SOLAS Convention, along with this introducing a new chapter to the Convention, chapter 10, Hence, the ISM-code entered into force on 1st of July 1998. The purpose of the ISM -code is to raise the quality of the management and operational performances regarding safety culture and environmental aspects. The ISM-code requires vessel operators to implement a safety management system throughout the fleet, helping them to achieve incident-free operations. It establishes an international standard for Occupational Health and Safety (OHS) management in ships and pollution prevention (Gül et al., 2020a; Mbong & Bygvraa, 2021).

The International Safety Management (ISM) Code as an occupational health and safety management system (OHSMS) is mandatory for all types of passenger ships, liquified bulk/tankers, gas carriers, bulk carriers, high-speed cargo craft of 500 gross tonnes and upwards, other cargo ships and mobile offshore drilling units of 500 gross tonnes and upwards (IMO, 2014; Sait et al., 2020). This implies that the ISM Code obligates the shipping companies to redesign their management systems and daily routines to achieve their requirements (Sait et al., 2020). The Code places obligations on ship operators to maintain a safer working environment and establish safeguards against all pre-specified onboard health risks, and with the help of these safety management systems (SMSs), fatal accident rates have dropped significantly through the years (Roberts et al., 2014; Uğurlu, 2016; Uğurlu et al., 2018)

Safety within shipping operations depends on the reliability of the technical and human components of the ship-system (Man et al., 2018). However, operations are also targeted by the hostile marine environment itself, which might be the cause of some accidents which are out of the technical and human control. This shows the need for a systematic analysis of shipping accidents caused by the human factor and the continuous increment pressure for further improvement regarding the safety record of shipping (Gül et al., 2020b). Furthermore, it

requires shipmasters to ensure that the shipboard operations are carried out in accordance with the policies and procedures developed in the safety management system (SMS) (Bhattacharya, 2012). Pantouvakis & Karakasnaki, (2018) state the effectiveness of the ISM Code can be seen as a strategic option available for a shipping company to increase its competitiveness in the marketplace. Pantouvakis et al., (2018) add on to the statement by highlighting the importance of human resources as key differentiator to determine the achievement of organisational goals.

However, there is a clear distinction between vessels which fully embrace the concept of the ISM-code and those vessels which are only aiming to fulfil the code's minimum requirements (ISM-code, 1998; Oil Companies International Marine Forum, 2008). This variability between safety cultures may result in a charterer with due-diligence concerns having to assess the operational standards of individual vessel operators.

Maritime transport accidents are complex and caused by a combination of events or processes involving various actors that ultimately lead to disastrous consequences including loss of human and marine life and irreparable ecological, environmental and economic damage. A lot of studies conducted on risk assessment have appointed direct or indirect human error as a major cause of maritime accidents (Shenkir et al., 2012; Włodzimierz & Szczepanek, 2022). One aspect of the newest edition of ISGOTT (International Safety Guide for Oil Tankers and Terminals) from 2020 is the human factors. This sixth edition has been updated by Oil Companies Marine Forum (OCIMF) and the International Chamber of Shipping (ICS) together with the International Association of Ports and Harbors (IAPH). Support has also been provided by other industry associations including INTERTANKO, the Society of International Gas Tanker and Terminal Operators (SIGTTO) and the Society for Gas as a Marine Fuel (SGMF). According to OCIMF, ICS and IAPH, the reason for the changes was that there was a need to include guidance on new or topical and critical issues current in today's industry including discussion on Human Factors and Alternative and Emerging Technologies (ICS et al., 2020). These issues can be seen in the self-assessment programme called SIRE 2.0.

2.5.2 Vessel inspections

Effective management of health, safety and environmental protection is critical to the tanker industry (ICS et al., 2020). One way to ensure safe practices of operational performances is to conduct vessel inspections (Knapp et al., 2011). The effectiveness of safety inspections of ships has been analysed from various angles, but until now, relatively little attention has been given to translate risk reduction into incident cost savings. A monetary quantification of the cost savings that can be attributed to port state control inspections and industry vetting inspections (Knapp et al., 2011). The authors show for industry inspections, the range of average monetary benefits of the reduced risk of total loss of ships realised runs from USD 93.5 to 169.5 thousand (median values of USD 16.8 to 33.1 thousand) for dry bulk, and from USD 136.7 to 379.0 thousand (median values of USD 43.6 to 131 thousand) for tankers. The authors further address that the cost savings of industry inspections are higher, especially for tankers, since the effect of industry inspections is stronger and these inspections are also much more extensive than port state control inspections (Knapp et al., 2011) that the cost savings of industry inspections are higher, especially for tankers, since the effect of industry inspections is stronger and these inspections are also much more extensive than port state control inspections (Knapp et al., 2011).

One of the main goals of inspections is to improve the safety quality of vessels and to reduce the probability of future incidents (Knapp & Heij, 2020). This study further shows there is room for improvement in targeting vessels for inspections and in determining vessel-specific inspection priority areas (e.g., bridge management versus machinery related items).

The safety of tankers is influenced by many various factors (e.g., human factor, ship factor, environmental factor, and management factor) (Zhou et al., 2023). However, the amplitude of those factors' contribution to the crude oil tanker mortality and the distribution characteristics are still unclear. At present, the accumulation of accident data over the past decades has assembled a relatively rich database (Zhou et al., 2023) The authors further state that in order to improve onboard safety, it is significant to systematically analyse the critical factors and hot spots of the occurred accidents based on available maritime accident databases and forums.

The article by Knapp & Franses, (2010) presents a comprehensive review of the maritime safety regimes and emphasises on how to improve the system. The results show a complex legal framework which generates a high number of inspections and overlapping of inspection areas where no cross-recognition is established by the various stakeholders. Although the safety system seems to be successful in eliminating substandard vessels and at the meantime average insurance claims costs are considerably lower for inspected vessels than non-inspected vessels, the authors further implies that the economic conditions of the shipping market also influence safety quality besides the frequency of inspections. Knapp & Franses, (2010) states that significant differences can be found between commercial and industry driven inspections, and port state control inspections regarding decreasing the probability of casualty.

According to OCIMF's SIRE Inspector Training and Accreditation Guidelines (2017) ethics, vessel inspector's report shall be unbiased, and be performed in such an accurate alignment in regard to uphold the integrity of the SIRE Programme (OCIMF, 2017). Guggisberg, (2019) highlights the importance of unbiased nongovernmental actors in improving compliance. However, this is not without strain on the inspectors since there are a variety of human behaviours where some acts are dominated by consciousness and even more acts are not perceived and negligent by people, called subconscious behaviour (Peng & Ke, 2014).

To be effective as a management system, there is more needed than just to have the procedures in place. Awan et al., 2018 mentions three aspects of social sustainability assessment: health and safety issues, labour standards and community development (Awan et al., 2018). These aspects require the right resources in order to reach the full potential of the management system in regard to health and safety, quality of working conditions, impact on employment, education and training, knowledge management, innovation potential, customer acceptance and societal product benefit, and social dialogue (Shiau & Chuen-Yu, 2016). To be a fully effective shipping management system, management must also provide suitable resources to ensure that the vessel is accordingly managed, crewed, operated and maintained by well-trained, competent personnel (ICS et al., 2020). OCIMF's Tanker Management and Self-Assessment (TMSA) programme was introduced 2004 and is based on both international regulatory documents such as IMO's STCW-95 and the ISM-code, as well as national regulatory documents, such as European legislation (current and future) i.e., International Carriage of Dangerous Goods by Inland Waterways (ADNR/ADN), Reglement Onderzoek Schepen op de Rijn (ROSR), and United States Coast Guard (USCG)/ Code of Federal Regulations (CFR). Furthermore, it also references non-regulatory documents such as the International Chamber of Shipping (ICS) guidelines and practices in order for vessel operators to improve their existing quality-management systems (OCIMF, 2017).

The TMSA is provided to the vessel operators as a tool to help them assess, measure and improve their company's management systems (Oil Companies International Marine Forum, 2008). The TMSA targets all tank vessel operators, including coastal tank vessels and barges. The programme works as a best-practice guide for vessel operators and encourages vessel operators to assess their safety management system against listed key performance indicators

found in the tables in the chapter of the TMSA-guide (Oil Companies International Marine Forum, 2008).

The TMSA is divided into three parts, where part one introduces the TMSA and its guidelines. Part two explains the application of the guidelines and how to implement it. Part three presents the twelve elements of the TMSA guidelines (Table 1).

Table 1 Elements of TMSA (OCIMF, 2017)

Element	Content
Element 1	Management, leadership and accountability
Element 2	Recruitment and management of shore-based personnel
Element 3	Recruitment and management of vessel personnel
Element 4	Reliability and maintenance standards
Element 5	Navigational safety
Element 6	Cargo, ballast and mooring operations
Element 7	Management of change
Element 8	Incident investigation and analysis
Element 9	Safety management
Element 10	Environmental management
Element 11	Emergency preparedness and contingency planning
Element 12	Measurement, analysis and improvement

The elements follow the key components of the continuous-improvement cycle, which are “Plan”, “Act”, “Measure” and “Improve”, a concept developed by W. Edwards Deming, who introduced the concept in Japan in the 1950s (Brau et al., 2019). The elements are therefore divided into four stages, where each of the stages contains key performance indicators. Each KPI is translated into a best-practice guidance, disposable for the user to use as guidelines on its self-assessment. Looking at the three pillars of sustainability, the TMSA can be divided into two blocks where the four first elements of the programme focus on social aspects, such as management of staff, leadership and soft skills, and accountability.

The second larger block is focusing on safety procedures, safety processes and environmental aspects connected to the operational work conducted. Both of the blocks are connected to the economical aspect in regard to cost of equipment and hiring of staff, but also the investment required, based on the KPI’s presented in the TMSA which concerns both maintenance of equipment and education of staff. For this paper, the authors are focusing on the elements in the TMSA linked to social aspects, which they consider to be Element 1, 2, 3, 7, 8, 9 and 12.

These elements were chosen based on their content, main objectives, aims and KPI's. The chosen elements are further enlarged and explained in table 1 in Appendix A.

2.6 Communication

Impact-analysis of potential policy options is at the heart of the impact assessment process. It has evolved from being associated with a strict cost benefit analysis to an analytical philosophy capable of incorporating social and environmental concerns (Wang et al., 2020). As a step towards a more socially sustainable shipping industry, one has to reconsider the aspect of sanctions if not complying with active legislations. The regulatory regime of the Norwegian petroleum industry has received international awareness due to its characteristics and the comprehensive use of dialogue as a policy instrument instead of formal sanctions, in cases of negligence (Forseth & Rosness, 2021). Dialogue as a policy instrument within a regulatory regime is a questionable concept, which also applies to a varied number of definitions, and the lack of research regarding sufficient influence from using dialogue as a policy instrument highly counteracts the instrument from reaching its objectives. There have been, and still are, debates about the challenges for this kind of regime in light of changing conditions such as recession and cost cutting in the industry and the pressure towards balancing rules and standards and the introduction of new players (Berthelsen et al., 2015; Forseth & Rosness, 2017). Despite this, the Petroleum Safety Authority Norway (PSA) implies that dialogue has a great impact upon the industry (Forseth & Rosness, 2017). Furthermore, openness and a short distance between decision-makers and executors also affect the ability of the organisation to discover mistakes and address them earlier in the stage (Jonassen, 2015).

The technology which a shipping company incorporates into the operation of its offices on land may vary the extent and basic dimensions of its organisational structure, as well as the profile and the capacity of its personnel (Tian et al., 2017). The installation of high-technology equipment (i.e., route management technology, propulsion and consumption data, data recording etc) and the relevant systems on board its vessels and in its offices permits the assignment of jobs to the personnel of the vessels and reduces the need for staff in the offices, since some of these jobs are now carried out electronically (Wagner, et. al., 2022). According to Wagner et al., (2022), high technology equipment has in this way contributed to the reduction of organisational complexity, as it leads to the creation of more flat organisations with fewer hierarchical levels and a greater depth of authorisation for the taking of decisions in personnel of lower rank. Information can be available to the whole of the personnel, a factor which facilitates the taking of decisions and increases the range of control of management executives. At the same time, the IT infrastructure favours teamwork, while better access to communications by the use of satellites and the Internet reduces the complexity resulting from the geographical dispersion of the companies' activities (Theotokas, 2018).

3 Method

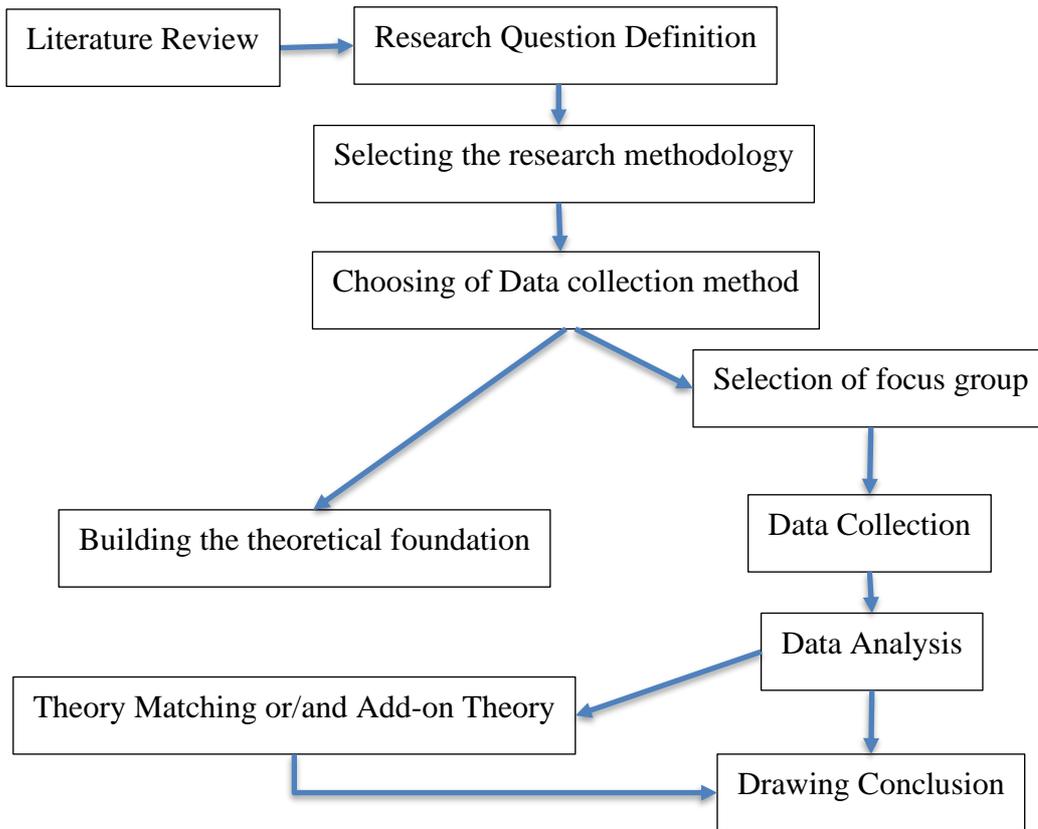
This chapter describes the research strategy for resolving the addressed research problem. It includes the research approach, the methods used for collecting data and how these were later analysed and synthesized.

3.1 Research Design

To solidify the theoretical aspect of the case analysis, an abductive approach (Dubois & Gadde, 2002) was taken which involved the development of a ground theory (Rashid et al., 2019) also referred to as the theoretical foundation or theoretical framework of this thesis. The theoretical framework was used in turn to analyse the gathered data that has been collected through interviews with people involved with SIRE 2.0 and knowledgeable about the new requirements. The use of abductive reasoning allowed for the perception of this phenomenon by relating it to other previously experienced and explained phenomena and as this thesis centres around change the chosen approach aimed to establish a situational fit between observed facts and rules as in previously studied concepts (Dubois & Gadde, 2002). For this thesis an explorative case study was conducted to focus on business practices and clarify the understanding of the research problem. Considering (Saunders et al., (2009) statements on exploratory studies, the direction of the research was adopted along the way as a result of new data and new insights. The intention of having an explorative approach to meet the purpose of this thesis was to clarify the understanding of the given problem (e.g., the introduction of a non-statutory requirement in the tanker segment) since the nature of the problem was unclear e.g., how this new non-statutory requirement i.e., SIRE 2.0 could transform a company. To accomplish this, a single case study approach was taken, providing a unique opportunity to observe and analyse the phenomena in depth (Saunders et al., 2009). The introduction of SIRE 2.0 to the market is regarded as a phenomenon in this thesis, as it was selected as the subject of the exploratory study.

The initial literature review was based on the following concepts within the maritime industry: management of change, governance and regulatory compliance, human factors, risk management, and occupational health and safety. In addition, a literature review was conducted on the requirements of the new SIRE inspection program i.e., SIRE 2.0. The research process entailed an iterative approach of system combining (Dubois & Gadde, 2002; Timmermans & Tavory, 2012) whereby emerging concepts were continually examined to reinforce the theoretical foundation. Subsequently, the criteria for selecting suitable interviewees were established, some of which were the job titles and level of involvement with SIRE 2.0. Concurrently, a theoretical framework was developed, which served as the basis for formulating the interview questions. The semi-structured interviews were then conducted, and the data collected was systematically analysed. Figure 1 shows the research process of this thesis.

Figure 1 Research Process (source: The Authors,)



3.2 Data Collection

A literature review was conducted to establish a theoretical framework for providing a better understanding of the existing knowledge in the field. This process formed the basis of both the ground theory and the case-based theory. The grounded theory in this thesis drew upon established concepts to inform the research without limiting the scope of potential results. It serves as both an argument and a means of fostering further theoretical innovation (Timmermans & Tavory, 2012). Literature for the theoretical foundation was found through search engines such as the Chalmers library, Web of Science, Google Scholar and Scopus. Academic articles, books, conference reports, grey literature, standards and codes were retrieved from the search engines. The literature review for this thesis started in November 2022 and ended in May 2023. In total 155 references were used for this thesis.

Before starting the literature study keywords based on ship management, risk management, business practices, governance and compliance, sustainability and KPIs were chosen so that relevant references could be found through the search engines. Keywords used comprised vessel inspection, human factor, management of change, non-statutory requirement and safety management. More keywords were then added along the way as the study developed in specific directions in compliance with the selected abductive research approach. Added keywords included socio-technical systems, success factors, behaviour-based safety systems. One of the primary criteria employed in source selection was the year of publication, specifically sources from 2010, which marked the introduction of significant amendments to the Standards of Training, Certification and Watchkeeping for Seafarers (STCW) convention, referred to as the Manila amendments. These revisions included essential new training mandates for Tanker Training, such as the development of Competence Tables for oil, chemical, and gas tanker

operations, and leadership and teamwork competence requirements for deck and engine officers. Another criterion that informed source selection was language, with a preference for materials published in English and Swedish. The journal that the article has been published has also been used as a criterion of selection. Sources of information and statistical data pertaining to tanker vessels were drawn from reports published by reputable organisations such as the European Maritime Safety Agency, the Oil Companies International Maritime Forum (OCIMF), and the International Association of Independent Tanker Owners (INTERTANKO).

In addition to academic literature several types of legislation were used which goes under the term “grey literature”. The reason for including grey literature in the thesis is because grey literature contains key information regarding the topic, which other peer-reviewed journals would refer to later on in the theory section and would act as the ground statement on further improvements and arguments. If grey literature were not included, important aspects on this topic would be lost (Mahood et al., 2014). The grey literature relevant for this report were legislation regarding psychosocial working environment and occupational health and safety of employees, with emphasis on seafarers working onboard tanker vessels. The tanker segment was chosen based on the type of legislation connected to the segment. According to IMO and International Safety Guide for Oil Tankers and Terminals (ISGOTT), the performance and maintenance legislation regarding tanker vessels are higher amongst stakeholders compared to other types of bulk carriers/vessels, due to the harmful effects the cargo can have on both animals, environment and people (ICS et al., 2020). ISO standards used in this study is also considered grey literature.

3.2.1 Case study

Qualitative and quantitative research may strive towards different objectives and for example case research does not oppose to produce results that can be statistically generalised (Kähkönen, 2011). However, as Yin (2009) suggests, the results will provide analytical value if they clarify or extend knowledge of the existing theory (Yin, 2009; Kähkönen, 2014). Since qualitative studies aim is to investigate the qualitative aspects of research questions, Yin (2009) continues by saying since “how” and “why” questions are explanatory in nature, they are likely to lead to the use of case studies. Yin (2009) defines a case study as an empirical analysis which investigates a contemporary fact within its real-life context, when the boundaries between the fact and the context are not obvious and multiple sources of evidence are used (Yin, 2009). Yin (2009) suggests that multiple sources of evidence should be used to establish validity and reliability of the study.

Case study as a research method is suitable for the research of operative management segments, including but not limited to supply chain management and purchasing and supply management (Kähkönen, 2014). It enables the collection of rich and profound data, providing an in-depth analysis of the fact in question which can be crucial for example the development of supply relationships (Kähkönen, 2014). Kähkönen (2014) continues by enhancing the understanding concerning the process of case studies and highlights the significance of qualitative case studies especially in the research fields of supply chain management, logistics, purchasing and supply management and operations management.

The selected tanker shipping companies included in the study were all based in Europe. The scale of the companies varied, where six out of total eight companies were medium sized regarding global market operations mostly operating in the Northern hemisphere. Two out of eight companies operated world-wide. Data were collected through focus group interviews and

semi structured interviews with participants occupied in onshore departments as well as onboard deck department.

Focus Groups

By means of a purposeful sampling strategy suggested by Merriam et.al (2016) the participants were classified into three distinct groups, taking into consideration their respective backgrounds.

The first group consisted of representatives from organisations that provide instructions, guidance as well as training in SIRE 2.0. Participants in this group were approached through emails which presented the purpose of the study. Once agreed to, an interview was booked and carried out digitally through Microsoft Teams.

The second group included participants that were initially presented the purpose of the thesis during Sjölog 2023, a fair event that took place in Lindholmen Science Park. The fair's primary objective is to foster interactions between students and industry representatives in the shipping sector, enabling them to engage in networking opportunities. Company representatives who expressed interest in the research project were provided with an information flyer containing a barcode. By scanning this barcode, users were directed to a Google Form used to register their interest in participating in the study, along with information on the study's objectives, eligibility criteria, and ethical guidelines. Other eligible participants who were not present at the event were contacted via email after providing their contact information, see Appendix B for outlay of email. Other interviewees in the second group were contacted through personal contacts. In both cases and like in the first group a meeting was arranged and carried out digitally.

The majority of participants comprising the third group were identified through soliciting contact information from individuals in the second group who were considered suitable for inclusion. Additionally, participants were also selected through personal contacts.

Individuals who provided their consent to participate in groups two and three were scheduled for interviews via electronic mail and subsequently conducted via digital means, primarily through Microsoft Teams. One participant, however, was subjected to a hybrid interview format, utilizing both Microsoft Teams and a telephone, as a result of inadequate internet connectivity.

The group and area of involvement of the participants are listed in Table 2.

Table 2 List of Participant

Group	Participant Nr.	Are of involvement
Group 1	Participant 1	Manager at OCIMF
	Participant 2	Manager at INTERTANKO
Group 2	Participant 3	Superintendent
	Participant 4	Superintendent / Vetting Coordinator
	Participant 5	Vetting Inspector
	Participant 6	Superintendent
	Participant 7	Compliance & Systems Manager
	Participant 8	Superintendent
	Participant 9	HSEQ Manager
	Participant 10	DPA
	Participant 11	Risk Manager
	Participant 13	HR Director
	Participant 14	Charterer
Group 3	Participant 15	Personnel Manager
	Participant 16	Second Officer
	Participant 17	Captain
	Participant 18	Second Officer
	Participant 19	Second Officer
	Participant 20	Chief Officer
	Participant 21	Second Officer
Participant 22	Second Officer	

3.2.2 Semi-structured Interviews

Semi-structured interviews were considered an appropriate method since it gave the interviewees the freedom to share their own thoughts and reflections. Therefore, for this study a qualitative non-standardised interview process was followed (Braun & Clarke, 2006; Willig, 2022).

As mentioned, the semi-structured interviews were carried out digitally which allowed the synchronous recording and transcription of what was being said as well as building rapport with the participants. For ethical reasons the interviewees were informed and asked for their consent

to be recorded. When the emails were sent a consent form including the ethical rules of the study was attached (see Appendix C). It is important to state here that no recording started without first asking for permission to do so. To strengthen the validity of the information taken, participants were asked to state how long they have been working within the company and how long they have been involved with vetting, risk management and compliance. Finally, once the recording started the ethical rules were repeated to emphasise that the participation was voluntary and that a withdrawal was allowed at any time and that in case any personal information was shared those would be handled according to the GDPR.

The interview was a teamwork between the interviewers. One mainly asked the questions while the others took notes, ensuring that all questions were asked or covered by what the participant was saying. It was decided to do so so that the tasks were equally shared among the team and so that the interviewee was not bombarded with many questions from different people since attitudes, feelings and orientation of an interview can have an impact on the answers given (Merriam & Tisdell, 2015).

The questionnaire comprised a series of general themes and inquiries, followed by a set of more specific questions directed towards SIRE 2.0. The precise questions posed to interviewees varied slightly depending on their respective backgrounds yet remained grounded in the same overarching themes. These themes included the following:

- The interviewee's relationship with OCIMF and other pertinent associations,
- Management of change,
- Communication of non-statutory requirements,
- The interplay between risk management and vetting inspections,
- (In)adequacies of guidelines,
- Human factors in daily operations, and
- Allocation of resources in response to newly implemented changes.

Although there was a specific order of questions the flow of the conversation allowed alterations and follow-up questions (Saunders et al., 2009). Appendix D lists the interview questions of the semi-structured interview.

3.3 Data Analysis

Each completed interview was transcribed and subsequently reviewed and edited by listening to the recordings. This process was conducted to identify any transcription errors that occurred due to inaccuracies in the voice-to-text program. By reading the transcripts identifying new themes that emerged during the interviews, which were not covered in the original questionnaire were theoretically explored in further interviews. To avoid excessive data collection, the number of interviews were chosen carefully to see if the answers began to repeat themselves often enough to consider a saturation of responses (Braun & Clarke, 2006; Willig, 2022).

The verbatim transcription of each transcription went through a thematic analysis from which perspectives of the various participants were identified, similarities and differences were highlighted and unanticipated insights were generated. All these were then translated into patterns that were used to construct the discussion section of this thesis. However, to avoid any lack of literature supporting the discussion of this study, the theory behind each theme was studied and included in the theoretical framework (Nowell et al., 2017). This was done to strengthen the trustworthiness of the thematic analysis. At this point in a triangulate way each theme was explored on different levels and perspectives (Fusch et al., 2018).

3.3.1 Theory of SIRE 2.0

In response to a growing need for a more comprehensive tanker risk assessment tool, the Oil Companies International Marine Forum (OCIMF) formed a Vessel Inspection Programme (VIP) Steering Group and a specialist Working Group in 2017 to review and enhance its existing Ship Inspection Report Programme (SIRE) (OCIMF, 2022b). The outcome of this effort was the launch of SIRE 2.0 in 2020, which is regarded as a new reporting framework that takes into account not only the quality of the vessel, but also the quality of its crew. This updated version of SIRE aims to provide a more complete and holistic assessment of a vessel's safety and environmental performance, which is critical for the safe and sustainable transportation of crude oil, petroleum products, and chemicals. This reflects the increasing recognition of the importance of well-trained and competent crew in ensuring safe and efficient vessel operations. To achieve this, the program focuses on four key areas (OCIMF, 2022):

- Accuracy: Providing an accurate description of how key safety and operational risks are managed and verified on board a vessel, ensuring that both charterers and ship owners have access to reliable and consistent information.
- Capability: Training and developing high-quality, consistent, and ethical inspectors who have the skills and knowledge necessary to perform thorough and objective inspections.
- Reliability: Strengthening the reliability of vessel inspections and reducing the need for repeat inspections, ensuring that the process is efficient and cost-effective for all parties involved.
- Adaptability: Responding rapidly to changes in human factors, industry developments, regulatory frameworks, and technological advances to ensure that the SIRE program remains relevant and effective over time.

OCIMF states that these four key areas are to be strengthened through practical improvements, enhanced marine assurance data and vessel inspection, improved report structure and format and lastly through an increased focus on the human element. The latter is to be assessed by using what OCIMF defines as Performance Influencing Factors (PIFs) which are those that influence or shape human performance and can enhance, assist, degrade or obstruct it(OCIMF, 2022c). These are:

- Recognition of safety critically of the task or associated steps
- Custom and practice surrounding use of procedures
- Procedures accessible, helpful, understood, and accurate for task
- Team dynamics, communication, and coordination with others
- Evidence of stress, workload, fatigue, time constraints
- Factors such as morale, motivation, nervousness
- Workplace ergonomics including signage, tools, layout, space, noise, light, heat, etc.
- Human-machine interface (e.g., controls, alarms, etc.)
- Opportunities to learn or practise

Figure 2 Areas of SIRE 2.0 Improvements (source: The authors, 2023)

Improvements	New attributes	Impact
<p>Practical improvements (OCIMF, 2022b)</p>	<ul style="list-style-type: none"> • Inspection criteria on equipment, procedures and human factors • Inspection processes and monitoring protocols • Web-based tablet devices • Updated policies, procedures, and user guidance that are housed in an online process documentation library. • Training and continuing development of inspectors 	<ul style="list-style-type: none"> • Enhanced tools and strengthened governance processes • In-depth reporting outcomes for improving vessel safety systems. • To carry out the inspection efficiently • Documenting inspections and feedbacks in real-life • Access to up-to-date information for inspectors • Maintaining a high and improved standard of delivery over time
<p>Enhancement of Marine Assurance Data (OCIMF, 2022a)</p>	<ul style="list-style-type: none"> • Digital format of inspection • Utilising tablet devices to complete a Compiled Vessel Inspection Questionnaire (CVIQ) • A sophisticated algorithm generates a customized questionnaire • CVIQ generated by the software evaluated the vessel's type and inspection history • Integration of records, such as photography, HPVQ, Port State Control (PSC) reports, crew matrix, and incident data 	<ul style="list-style-type: none"> • Tailored and precise assessment • Hardware, processes, and human factors can be rated and backed up by documentary evidence • Identify root cause of any issues that may arise • Create a centralised system for marine assurance

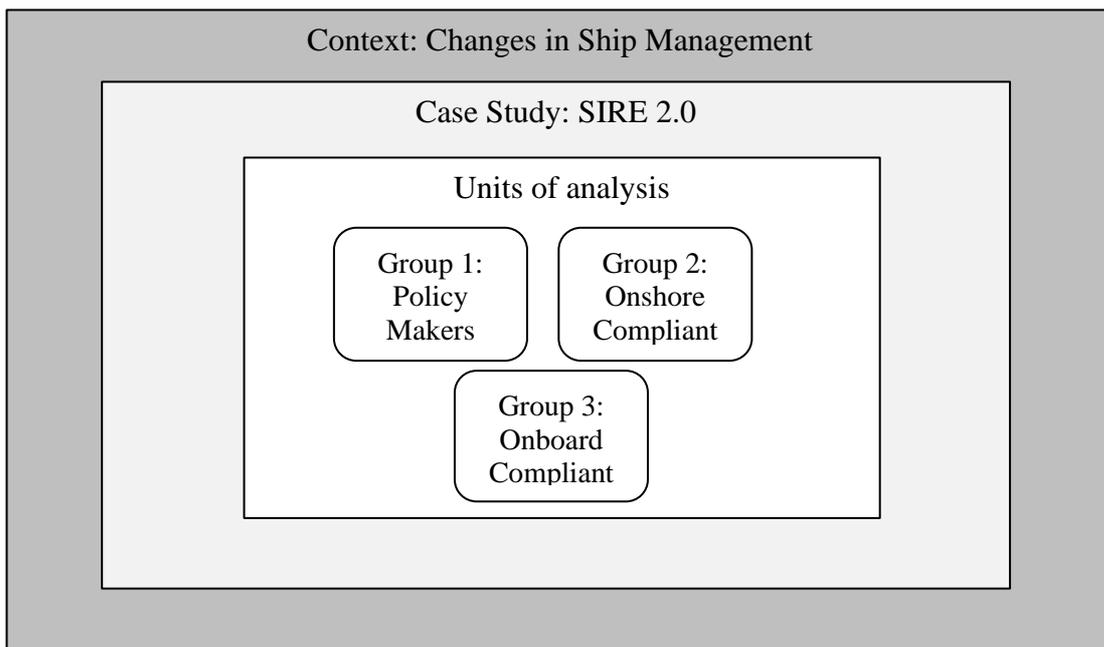
Improvements	New attributes	Impact
<p>Enhancement of Vessel Inspections (OCIMF, 2021b)</p>	<ul style="list-style-type: none"> • Inspection template for pre-vetting preparations (including vessel particulars, certificates, pre-inspection questionnaires, past inspection observations, Port State Control (PSC) data, incident data, as well as relevant photographs and plans) • Core Questions (minimum requirements to meet the risk assessment criteria) • Rotational Questions (to ensure that non-core questions will be covered over a period of time.) • Conditional Questions (specific questions based on vessel information i.e., ship type, area of operation) • Campaign questions (targeted inspection areas of specific focus from OCIMF and its membership) • Use of tablet device and GPS tracking 	<ul style="list-style-type: none"> • Vessel related information is accessible to the the inspector before they board the vessel • Enhance the quality of the inspection report and resulting marine assurance data • Facilitate the expanded inspection template and support the delivery of the four-tier question set, while providing photographic verification to support the results.

Improvements	New attributes	Impact
<p>Enhancing the Report Structure and Format (OCIMF, 2021c)</p>	<ul style="list-style-type: none"> • Report structure and format focusing on processes, equipment, and people • Reports to include detailed data i.e., photographic evidence 	<ul style="list-style-type: none"> • Analysable Root-cause analysis
<p>Enhanced focus on human factor (OCIMF, 2021a):</p>	<ul style="list-style-type: none"> • Every process, policy and procedure built into the inspection regime will assess human factors issues by reporting performance relating to human factors • Identification of physical, psychological, and social factors that affect human interaction with equipment, processes, and other people • Address human factor related issues • Check if tools for demonstrating the quality of measures are in place to support human performance 	<ul style="list-style-type: none"> • Systematically identify issues and conditions that lead to risks from a human factor perspective • Recognizes that human error, actions and decisions can be influenced by workplace design, equipment and safeguards, and work culture • Vessel operators to be informed about the effectiveness of the protective system, and the extent to which the human activities that these protective systems rely on are sufficient • Addressing human factor issues and that tools for demonstrating the quality of measures are in place to support human performance. • Everyone involved is a subject to a culture of openness, transparency and cooperation

3.3.2 Units of Analysis

“Unit of analysis” is a concept described as the analysis which relies on its segregation of the complex whole into units, where units represent the basic characteristics of the whole (Ma, 2023). Matusov (2007) argues that an appropriate unit should be holistic so that the wholeness of the subject is preserved and should have a clear boundary so that the analysis of the unit is manageable. The units of analysis eased the process of thematically analysing the answers provided by the participants. (Braun & Clarke, 2006) argued that thematic analysis is a useful method for examining the perspectives of different research participants, highlighting similarities and differences, and generating precipitous insights. In this paper, the context of Ship Management and its pillars such as legislatives and guidelines will be firstly explained. Ship management is a complex system, defined equally by legal compliance as it is defined by customer demands and commercial value. The overall context will be supported by a case study on the upcoming changes in the commercial driven inspection programme called SIRE 2.0. The units of analysis in the case study are three main groups defined by their role and status in the ship management system: policy makers, onshore compliers and onboard compliers. Each unit of analysis contains a number of participants, as presented in Figure 3.

Figure 3 Thesis’ Case Study Design (source: The authors, 2023)



4 Results and analysis

This chapter presents the results from the analysed semi-structured interviews. The chapter is divided into three sub-sections that include the information gathered from policy makers e.g., those who make the rules, shore compliant e.g., those who follow ashore and on-board compliant e.g., those who follow on board.

4.1 Policy Makers

Results for Policy Makers are presented in this section. These are derived from the analysis of focus group 1. OCIMF and INTERTANKO have provided insights into the new inspection program. The participants' statements were analysed thematically giving three major patterns: motivation behind the human factor in SIRE 2.0, changes in vetting process and ship management, and change of the industry's mindset. Then the INTERTANKO Secretariat reviewed drafts that were sent from OCIMF. Every draft was viewed by INTERTANKO from a pragmatic and practical perspective. For example, they looked into the difficulty of using the new program, how each change can be worked on a ship, if the change reflects what OCIMF is trying to achieve, and if the new inspection program fits the normal operating practices.

4.1.1 Motivation behind SIRE 2.0 and Human Factor

According to OCIMF the key principles of the new SIRE program are bringing human factors and enhanced governance so that the inspection program is more reliable, repeatable and dependable. When SIRE program originally started, the ships were inspected from a hardware and equipment perspective and as the system developed the ships were inspected from a procedural perspective too. The mid-2010s showed that the performance of the industry was plateaued. At that time, OCIMF noticed that for the existing SIRE program the limits from a hardware and procedure perspective have been reached., the quality of ships has gone up due to the introduction of ISM and TMSA, and the general standard of procedure development within the industry had improved too. Incidents of significant nature have been driven down but no further improvement was visible. Nevertheless, the human part of the SIRE program was the least developed considering that:

“[...] it always takes people to carry out the procedures and operate the equipment effectively”
(Participant 1)

The data that OCIMF collected and analysed demonstrated that the people were the most important part of operating the vessel. According to conducted interviews the crew worked according to the procedures on how to use the equipment and detected when equipment was not working properly. Then the crew would bring this to the attention of the shore side and from there take the corrective action to fix it. In addition, OCIMF task was to look how their existing system since as OCIMF stated:

“[...] people were left to do what was right based on some very outline guidance” (Participant 1)

Considering the second major aim of SIRE 2.0, which is governance enhancement, OCIMF seeks to generate consistent results regardless of whom and where the inspection is carried out. In other words, once SIRE 2.0 launches the inspections should generate consistent results that are repeatable should another inspector go on board the same ship with the same people on board.

From an external perspective INTERTANKO stated that the motivation behind 2.0 was to ensure that the ships being vetted were fit for the modern technology available. According to

INTERTANKO, SIRE has been implemented for 20 years now and as with any system that needs to be upgraded, this inspection system too needs to recognize modern technologies, approaches and ideas. By integrating the human element in the inspection program, it is now the goal to ensure that seafarers do the right job, have the right tools and equipment while working in a safe environment.

4.1.2 Changes in vetting process and ship management

OCIMF created the system in such a way that the right number of questions are selected and to be applied the ship's type. INTERTANKO on the issues regarding real-time assessment mentioned:

“[...] Now the idea behind that was to make sure that there was no interference in what the inspector says or does. There were a lot of concerns that, due to the commercial implications of getting observations. As in, if you get above a certain number of observations, your ship may no longer be chartered by someone else, and if you do not charter it, you do not sail the ship and so on [since] SIRE really is the ticket to trade. [...]” (Participant 2)

The algorithm of the system can select questions based on the ship's risk ranking. Certain questions critical to the success of operating a ship are always included, but rotational questions are considered and can give an overall impression of the vessel by answering a smaller number of questions. Quoting the INTERTANKO participant:

“[...] It's about making sure the seafarers are doing the right job, have the right tools, have the right equipment, are working in a safe environment, are able to do the job that is their task to do and also, it's not just about the negative side. Now there's also scope for putting the positive side in there.” (Participant 2)

With the new version it's more about interviewing officers and crew than just about administrating papers. OCIMF conducted 44 trial inspections which included a lot of training, feedback and procedural adjustments. It was known that the industry has gotten used to the traditional inspection process (VIQ7) and people were doing the same thing repeatedly:

“In fact, one [thing] that the industry has learned is how to hide stuff during an inspection” (Participant 1)

With the VIQ7 the inspector is assigned to find what was wrong with the ship. Then the ship operator would dedicate time to fixing the problem and then report that the problem was fixed. However, with the new system OCIMF is interested in why the thing was broken in the first place and what people are doing to fix it. The updated inspection program is not about trying to unhide broken stuff. Instead, it is supposed to be used in that way that the vessel operator is providing information about broken equipment voluntarily either through pre-inspection questionnaire or by informing the inspector before the inspection process starts. In other words, OCIMF now expects the vessel operator to share what is wrong. The inspector is then responsible for looking at the historical record to verify what was done to fix what was broken. This will be done by interviewing the officers and crew to justify that the documented process within the management system is being used effectively.

The new way of reporting and tracking the inspector avoids interference with the inspector's perception of what needs to be reported. Before, an inspector could remove an observation, for example after talking to the captain. However, with the new program if the inspector finds an observation, he must insert it in the pad. After the inspection, the observation can be removed, however there will be a record of such action.

The human element will focus more on people since humans are the ones that operate the equipment properly, recognizing when it is broken and reporting an issue to the management offices where people can make the right decision on how the ship can continue its operations safely. The last 20 years have shown that companies have spent a lot of money on people and their training but still people don't follow procedures. The purpose here is to have the vessel crew inform the shore side when a procedure is not good enough, and not fit for purpose. If done properly e.g., communication works well between the company and vessel then both sides solve the problem by taking the right action to correct the procedure.

Managers will now have a tool for understanding why things go wrong and avoid blaming. The new set of questionnaires will now recognize where people perform well because so far, the answers were binary e.g., yes/no. "No" indicated something bad and negative where yes was just acceptable. The inspection program will:

"[...] hopefully [going to] tell people what the truth is a sea now and if you don't like what you see it's not because something changed, it's because we are [...] able to uncover that."
(Participant 1)

OCIMF says that the most important thing that the vessel operators can do now is to stop trying to hide it from inspectors. They must recognize when things go wrong and use it to gain the maximum benefit.

"[...] That's the mindset the vessel operators need to have" (Participant 1).

The companies need to train their crew to make sure that the crew understands what they are being inspected for and why it is being done in a new way now. This does not mean that the seafarers should change the way they are working but they have to be trained on how to answer questions because saying something wrong can put the whole ship on technical hold and impact the commercial viability of the company and so on. Another key point is the training of the inspector to learn to listen to what the seafarers are saying. Everybody is using as much guidance as possible to inform themselves, not because the system they already have is not enough but because of the fear of the unknown. "If you've got a stable system, people know how to work it". Through the organizations actions INTERTANKO wants to communicate that:

"it's not a numbers game [...] it's about the quality of [the observations]" (Participant 2)

Hence, organizations that have been informed about the new SIRE program have put together procedures, but the concern is on a proportion of the industry who is not informed about the changes. For example, increasing numbers of operations will cause concern for charterers trading in niche markets that do not have in-depth understanding of the system as other places and other areas. INTERTANKO suggests that shipping companies should do a gap analysis to identify differences between the old system and the new. The ship operators should also read the guidelines but avoid overwhelming the crew with materials to read. The workplace environment should be psychologically safe so that if someone gets something wrong during the inspection he or she cannot be blamed.

4.1.3 Change of the industry's mindset

According to OCIMF, the tanker operators recognized that there is potential for improving the overall industry standard by differentiating vessel operators that put an effort on safety and those who do not. On that account, companies that want to continue doing well in the industry recognize that SIRE 2.0 is an opportunity to show the gap between their performance and others.

Based on OCIMFs and INTERTANKO statements the industry expects a high number of observations for the ships. The new system aims to diminish the suspicion that the companies

“[...] Work to pass the exam rather than work to make sure that the ship is entirely proper and safe.” (Participant 2)

If a ship has a lot of observations, it will be put on technical hold and it is not going to get any business because the reports are shared meaning that every oil and energy company sees the results for a specific ship. Now, there are a lot of concerns regarding observations because of the commercial implications getting observations has. Meaning that if you get a numerous number of observations the ship may no longer be chartered.

“SIRE [...] is the ticket to trade” (Participant 2)

According to OCIMF, the ultimate intention of including the human element in the new SIRE version is:

“[...] To find and motivate excellence where it existed and motivate people to thrive towards [excellence] [...] and try to raise the whole industry standards to make sure that everybody got a little bit better”. (Participant 1)

In addition, OCIMF expects to find human error and identify the reason for these failures by using the performance influencing factors (PIFs). Using PIFs is a matter of leadership accountability because leader should know that the crew is in many cases doing the best they can. By taking PIFs into consideration it will be easier to identified obstacles that restrain the crew from performing best. SIRE 2.0 is expected to change the mindset of the industry as well especially the blame culture that is experienced in the industry and raise the accountability from the shoreside, which will have an impact on the mentality of the shoreside environment. The updated program has a graduated scale of yes which is about rewarding for doing things better. SIRE has been focusing on a small percentage (3%) of vessels where conditions were unacceptable, the poor side, and passing over to the other side where people were excelling.

“[...] the right side of the curve [...] has never been looked at in SIRE because inspectors have to be completely objective about everything, and they mustn't have opinions [...] good wasn't a word they could use”. (Participant 1)

OCIMF hopes that the inspections the vessel operators will look at the inspection results as a metric of performance and as a motivation for improvement and exceeding expectations. One issue that people are concerned about is how the commercial world see SIRE 2.0 considering that the inspection report serves as a decision whether a ship should be contracted or not. Therefore, it is interesting from OCIMFs perceptions to see how the commercial world will see and use the results especially considering data on human performance. If people working onboard fail to comply or have done something wrong, it is recorded a negative observation and the PIFs indicate why that noncompliance happened in the first place.

“[...] in an isolated case it's not really that important [...] but where you are seeing the same kind of mistakes across the ship or across a group of ships withing the same fleet then that's when the concern will start to rise”. (Participant 1)

Considering that you can benefit greatly from the data, a pressing concern is to see how the people that make the decision on who uses the ships perceive the data.

4.2 Onshore Compliant

Results for Onshore Compliant are presented in this section. These are derived from the analysis of focus group 2.

4.2.1 Approach to change and transitioning to SIRE 2.0

The approach to change differentiated between companies due to the size of the company that the participants worked for because the bigger in size companies have the ability to allocate more resources in particularly keeping up with changes in statutory and non-statutory changes. One company in particular, which has more than 600 vessels under management, has a dedicated team that monitors changes in statutory and non-statutory requirements. In contrast companies that manage much less vessels (~10 vessels), stated that keeping up with changes is a difficult task and although the desired approach to change is “proactive”, due to the time-consuming task of monitoring changes, the company’s approach leans more towards “reactive”.

Proactive companies have a management of change protocol in change. For example, an interviewee explained the process of bringing a change in the company by stating that initially the first step is to justify why the change is necessary and how it would add value to the current state of the company.

“[...] the first step is always to see “does it belong to us? What do we have to need to do? [...]” (Participant 10)

Then the management of change process starts with the creation of a protocol and a checklist that includes all the tasks need to be performed. This is regularly reviewed and must be approved by the top management. All the heads of the departments attend the initial meeting where managers discuss the change and outlay the responsibilities. The management of change protocol is for the whole company, but the initiation of the process is a responsibility of the quality department that Participant 10 works for. In many cases, as the participant stated, various departments are involved. If for example some technical changes are required then this is assigned to the Nautical, Technical and Inspection (NTI) department. Or if monetary resources need to be allocated this fall under the responsibilities of the accounting department and so on.

“[...] Then we follow up and do what is necessary, looking for external resources that were needed [and] allocating our own resources where required, creating procedures, bringing them on board where necessary, [and] plan and perform training for the crew. [So that we are] ready when the [implementation] date comes. [...]” (Participant 10)

All participants falling under the “Onshore Compliant” category (except one), stated that there is communication and collaboration between them and the crew members since onboard personnel are highly involved during the change process. Feedback is given from and to the crew so that new changes are understandable and adaptable to the working environment and work routing of the crew on board. One participant in particular stated that the corona pandemic has brought the shore side of the company closer to the people on board because of the communication they had together and whatever actions the company implemented during that time of constant change are still applicable today. As it was stated during the interview on a weekly basis and considering new updates there were discussions about how to make the life of the seafarers easier, how to support them best and what procedures should be changed or even developed anew. All changes were discussed with the ship side and most of the changes implemented were proposal coming from the ship side which are still applicable today.

“[...] we didn't order or change the procedures just here from the desk, but we involved our crew at the very early stage. So already in March, April 2020 when we got aware that it would be very difficult to conduct crew changes [...] I sent [...] on board our proposals and ask for the inputs of our captains [...] and most of the issues and most of the new procedures which we implemented was proposals from board.” (Participant 13)

The participant that has no direct communication with the onboard personnel is responsible for all the policies, procedures, requirements, industry regulations and systems needed to facilitate that both onshore and onboard personnel are able to comply with those as easy as possible. In addition, the company has regulatory compliance centres responsible for making procedural changes and system changes. Any communication about changes happens through the distribution of BSM bulletins on board as well as office personnel. The bulleting informs about the changes that are coming up accompanied by articles informing about what the employees need to do, how it is going to impact them, what is going to change for them from a procedural perspective.

The transition to the new inspection regime from the ship management side is expected to be rough. As one of the participants stated SIRE 2.0 is a big procedural and technological change. For those who are new to a company the new inspection regime might not be as big of a change.

“[...] I think a lot of people who have been working with [the previous version] for a very long time, might look at it otherwise, because it's a big change. But for me, who is quite new [...] is a good change and it's good to be part of it from the beginning [...]” (Participant 8)

11 out of 12 participants stated that their companies have already conducted a gap analysis to identify weak areas that need to be supported by procedures. Others have not done so due to lack of resources or simply because the new inspection version has not yet been launched and therefore there is no need to carry out a gap analysis yet. When questioning about the guidance that the policy makers have provided (i.e., Intertanko and OCIMF) some stated that the material is satisfactory whereas others believe that a more practical approach would be preferable. This connects to the linguistic factor that some of the participant believe is an obstacle in complying. The guidelines are written in such academic language that it seems the language barrier of the crew members but also the personnel working ashore is disregarded. However, every participant stated actions on helping crew members to have a better understanding of the new regulations, ranging from developing in-house training videos to having officer seminars (e.g., seminars where high ratings are informed and discuss about new changes) and visiting vessels to brief crew members about changes in person.

“[...] being so proactive with regards to tying it into our own language and our own cultural aspects within our company. [...] We want to relate it to our seafarers in a way that makes sense and fits with our corporate language” (Participant 7)

All participants believe that the new SIRE inspection regime is expected to add more on the administrative work which increase the paperwork in daily operations. This is something that it is believed it will add additional stress to the crew. Some of the changes that the company needs to undergo regards the restructuring of the company and possibly the employment of more people to handle the paperwork. All 12 participants of Group 2 stated that there will be a higher collaboration between the department dealing with vetting and the HR department.

“If vetting and just what's related to vetting inspectors now take 20% of my time, I think it will take at least 100% for one person in our office to just manage the vetting inspections for our six vessels [...] including the pre-planning and closing out observations” (Participant 8)

4.2.2 Subjective Evaluation

Although there are no major changes in how the inspection for regular things i.e., broken equipment will be carried out, the SIRE inspectors now will conduct a psychosocial assessment.

This raises concern since most of the inspectors have no education on how to perform a psychosocial assessment and ship operators doubt that a brief training will grant them the appropriate knowledge to conduct such an assessment.

“[...] I think it will be so easy for [the inspectors] to make the inspection, but the different part is they should be psychologists also. So, I don't see that match and [...] these experienced, 60 years old guys [...] are not psychologist, they are all seafarers and tough guys.”

Even for the inspectors themselves SIRE 2.0 is a new concept that they need to get used to. Unlike the previous binary approach to assessing a situation what will now be graded as “expected” or “exceed expectations” relies allegedly on the inspector’s interpretation of the current situation.

“[The inspections] are always depending on the individual opinion of the individual inspector [...] You don't have the same basis to judge something. [The policy makers] give guidelines, yes, but it's always a matter of personal opinion” (Participant 9)

“[...] with any inspection it's about the interpretation of that inspector [...] And that means that you have every single person putting their own spin, their own perspective, their own experience, their own focus, their own, you know, what they think is important and compared to something else [...]” (Participant 7)

During the interviews, it was argued that inspections are inherently comparative in nature. For instance, if an inspector conducts two inspections, starting with a brand-new ship that is well-maintained, organized, and manned by a competent and educated crew, the subsequent vessel will unintentionally be evaluated in comparison to the well-organized one. The results may also be influenced by the composition of the crew present during the inspection.

“[...] If on the previous day the inspector was on a brand a new ship (i.e., six months old) [and had a] good and organized, master and chief engineer. So, everything is in line, everything is correct. There are very good electronic system and then [the inspector] goes on a different ship, which is 20 years old with all the subsequent aspect. And then they have a paper system still on-board opening files, searching for documentation. You can understand that the that the opinion of the individual inspector will not be subjective” (Participant 9)

The reported situation of the vessel may no longer accurately reflect the vessels current condition, if there are changes in the crew after an inspection. Therefore, the results will neither be permanent nor fixed considering that they are subject to change and based on the inspector’s perspective and even the crew’s composition.

“[...] it's very much you pointing out people and of course that's not the. The point is that you should evaluate and be positive and you should develop people. I think in in the most companies it will be negative, and people will be afraid. [...] people get nervous just [having people] being around or [being] assessed like that.” (Participant 11)

Participant 6 stated that there will be a problem for people when the observations start to relate to a certain rank on board, showing that a person’s knowledge, explanations and competence didn’t live up to the expectations of the inspector. This will result in pressuring the crew members more which will lead to poor SIRE inspections.

“[...] This increased focus on just interviewing people and seeing... .. How well they respond and then put an observation if the response isn't as expected, that's quite hard with the consequence that's related to a poor SIRE inspection.” (Participant 6)

4.2.3 Managing the human element

Managing the human element is not a new task for the ship operators and therefore it is not expected to alter any existing processes or practises of the ship operators. Participant 11 shared actions that have been implemented long before SIRE 2.0 was introduced to ensure that people on board are well taken care of so that their performance is not compromised. The company optimized for example the pilotage procedure where now the captain is allowed to be absent if a chief officer who had at least 30 manoeuvres is on watch.

It is noted that soft skills assessment, reflection and evaluation of performance is a topic that is now beginning to be frequently discussed. For instance, during navigational and engineering assessment it is assessed whether the crew member followed the procedures but also if they were communicative. This is expected to have an impact on the demographic of seafarers.

“[...] [Assessing soft skills] potentially could shift the type of people getting involved in the maritime industry because at the moment it's very heavily weighted towards the nuts and bolts and the practicalities. And then if you're having this sort of need for a soft skill assessment, it's perhaps a different kind of person [...]” (Participant 7)

Another participant, who appeared to be in agreement with the notion that evaluating soft skills will have a transformative effect on ship management, expressed the following:

“[...] in the longer run we as well as the industry will move forwards into deeper behaviour-based safety management systems, like some of the oil majors already have, and some other companies as well. [...] There is a long way to go, but I think [...] the focus will be even more away from the procedures [and] into the people” (Participant 10)

In order to focus even more on the people participant 5 argued that companies should identify why there is a problem with the human factor and not put the blame on the humans. Regarding the human factor in a bigger extent implies removing the focus from the human and identifying what influences the expressed behaviour which results in unwelcomed consequences. Nevertheless, based on Participant's 9 concerns, it is dubious whether a system could be able to assess human performance if the shipping system itself is not beneficial to those working on board. Instead, the systems are designed to optimize the ship's commercial viability, ensuring its chartering and efficient transportation of cargo.

4.2.4 Business-as-Usual (BaU)

The participants stated that although there is fear over the transition period, there is no other option than complying and adjusting operations according to the new inspection regime. Although OCIMFs inspection requirements are non-statutory, complying with them is inevitable since for the tanker segment SIRE inspection is the “ticket to trade”.

“SIRE is a pure commercial decision [...] if you want to trade, if you want to carry goods or products then you need to have it. [...] It's a ticket to trade” (Participant 15)

From the charterers perspective there is no difference whether the ship complies with the first or the second version of SIRE. Chartering a ship requires a well-approved ship from OCIMF.

And it is the ship owner's responsibility to ensure that the ship performs well during a vetting inspection, otherwise no ship can be contracted by the charterers. If a ship is not contracted, then the ship cannot be profitable.

"[...] In order for us to do a good job, we need to have a well approved ship. In order to have a well approved ship, you need to have good SIRE [...] For us doing the commercial, I don't think it would be harder, it's more for the owners. [...] the owners would do a great job because if they do not [...] we cannot fix the ship. And if we don't fix the ship, the ship will not make any money." (Participant 14)

Participant 9 stated that besides not being able to contact the ship, non-compliance may cost nearly more than double the operating cost. Participant 10 expresses that sometimes, a particular oil major may refuse to accept a vetting report from a rival organization due to corporate competition. This can result in unnecessary additional inspections for the ship, even when the ships do not actually require them which in turn adds on to the responsibility of the crew.

"Pressure coming from BaU falls on the shoulders of the captain and eventually the crew members that they need to be commercially fit which means that the vessel needs to be preferable. Otherwise, the charterer will not pick your ship. Then why should the owner pay the crew provided that there is no income for them. The crew is to their utmost to maintain and operate the ship, so the owner is able to charter it, the Charter is paying their owner which is paying the crew.

4.2.5 Exhibiting Competence and Raising the Industry's Standard

Managers regardless of accountability profile have stated that a positive outcome of the new change will be to "clean the market" off companies that do not comply with the norm and therefore compromise the safety of the vessel as well as the crew. All participants expressed that they have faith in the competence of the crew and the safety standard of their vessels. The more comprehensive inspection process of SIRE 2.0 will exhibit the organization's excellency to customers that will compare the safety of the vessels with others, which is expected to raise the quality of the vessels internationally.

"[...] I think that we do have competent crews and good-looking ships and well-maintained ships. [...] Hopefully it will be a be a fairer comparison between different ships operating worldwide. And I mean the quality internationally will have to increase [...]. (Participant 8)

Another opportunity that SIRE 2.0 brings is the distinction between companies that genuinely prioritize the crew and not only having the paperwork in place to ensure compliance. As Participant 13 expressed some ship owners are very administrative and have an excellent reputation when it comes to paperwork. They have all the procedures and the objective evidence in place but the occupational environment on the ship looks different than what the papers present. One way of recognising this distinction is to look into the retention rates of the crew. Companies who have low retention rate is where the human factor might not be the first priority of the company. The participant argued that assessing HR matters on board might be indeed challenging for some companies who have an excellent SMS on paper but life on board looks different. Therefore, ship and ship owners who have not complied in the past will struggle because now objective evidence is required. Another participant even stated that although the company might struggle with the transition in the beginning, in the end the company will come out stronger, with better portfolio and more competitive.

4.3 Onboard Compliant

Results for Onboard Compliant are presented in this section. These are derived from the analysis of focus group 3.

4.3.1 Internal and External Communication

The first pattern that was established is regarding the communication of the launch of SIRE 2.0. Based on the results from the interviews, five out of seven of the respondents with onboard occupations, have felt that the change has not yet been communicated well from the management. Although the change has not yet been implemented, some of the respondents felt like there is still a lack of information since it is only a matter of time when the implementation will take place. One respondent even went as far as claiming the response to change has to be ad-hoc due to the lack of time to prepare, as a sub-cause of lack of information provided.

From the results from the respondents, the continuous work of following up on new information regarding the SIRE 2.0, new videos and training procedures provided by OCIMF etc, puts a lot of strain on the shore personnel to be able to forward the information to the onboard personnel. Furthermore, based on respondents' answers from the interviews, the amount of information is too large to process effectively for the onboard personnel, keeping in mind that the processing of new non-statutory changes should not affect the operational work. Quote from one respondent:

"It would have been easier if the crew could be provided a checklist on what to change and how"
(Participant 20)

The new way of immediate reporting of the inspection performed has, based on the answers from the respondents, caused a concern within the industry. Before, small observations from the inspection were discussed between captain and inspector and were later on either removed or marked as fixed in the report sent. With the new way of doing the report, the observations cannot be discussed since the reporting is performed live, and every step of the inspector is clocked.

All of the onboard facilitated participants were reflecting over the poorly communicated timeline and implementation of the new programme. Since this aspect also was shown in the patterns of the shore-based participants answers, correlation can be drawn that the information flow falls short from the very beginning of the information chain, which starts with OCIMF. This, however, is linked to considerations OCIMF had to undertake along the way of the specification process of the new procedures of vetting, which is further explained under OCIMF's analysis.

Other than the timeline, onboard participants are overall satisfied with the information OCIMF have provided, such as instruction videos and other material. However, besides being qualitatively satisfactory, the quantity of the information has been comprehensive for many. One of the respondents even asked for further clarification in order for the onboard personnel to begin addressing the vessel type specific changes:

"Compile the questions in a way that fits to your operations and send it out as soon as possible for everyone to adapt in a good time, because if you get the everything too late" (Participant 20)

The communication regarding non-statutory changes between shore and onboard personnel relies on the information provided from the stakeholders, in this case it is OCIMF and INTERTANKO. Even though the information provided is of good quality, the large number of additional requirements, and the comprehensive number of new questions, makes it difficult for both operators and onboard crew to prioritize what is important from a vessel specific point of view, since all the information has to be gone through. This is why clarification on that topic have been requested by one of the participants:

"They could make shorter information to send out to the ships more than like here is the whole file because we have no time to read everything from work" (Participant 19)

4.3.2 Lack of Training and Crew Matrixes

Participants in the interviews underlined the importance of training in both of the skills. In relation to the new SIRE 2.0, many of the participants stated anxiousness regarding the assessment of human elements. Most of the participants stated a fear of being assessed due to not knowing what is being assessed, is it their training or them as persons? Working onboard might sometime become a way of living, and way for people to identify themselves with the work as a seafarer. Due to this type of identification, it makes it difficult for our onboard participants to distinguish what is being assessed during this new vetting procedure. One of the participants suggested the following on the question of how to streamline the transition to SIRE 2.0:

“Solution will be to educate the crew more [...] on safety and vessel specific equipment, but also soft skills like teamwork, team dynamics and cultural differences” (Participant 21)

In alignment to proper crew training comes also the complexity of the crew matrixes. It is not sufficient for seafarers to have the proper training and withhold the vessel specific certificates, the construction of the crew based on the amount of time of occupational work at sea, i.e., years of active service in the current rating, should also be complied. These matrixes put a lot of strain on shore-based personnel upon the planning and composition of crew and is also something which is being observed during vetting. By not aligning with the proper crew matrixes, there is a risk that the vessel might strike an observation based on that aspect.

4.3.3 Vessel inspections effect on rest hours

In regard to inspections, and specifically vetting inspections, this is an external event that is considered by some of the participants to not respect the working and resting hours onboard:

“[...] This new version of SIRE will impact us since there is a lack of time due to short port stay, so it will be hard keeping the rest hours intact [...]” (Participant 18)

Another participant addresses the need of increasing the skeleton-number of crew onboard:

“There are more complexities increasing in tanker transport, but the crew is remaining the same as the number of crew and the working hours are increasing with that complexity. So, if you increase the number of people on board, that will, of course, have a financial impact on all the companies, but that will be safer and, in that way, you will have a more efficient crew running the ship or doing SIRE inspection more in a good way and giving good results.” (Participant 21)

4.3.4 Cultural differences

Culture of hierarchy onboard vessels was mentioned as being one of the causes to prevent crew to express themselves and to have a more direct communication:

“Take away the hierarchy in communication[...] Solution will be to educate the crew more (on safety and vessel specific equipment, but also soft skills like teamwork, team dynamics and cultural differences) and to increase the number of hands onboard a bit more as well.” (Participant 21)

Other participants raised concerns regarding that the new concept would not be taken into consideration of the vetting inspector:

“They have to find the inspectors that have a good attitude towards this new SIRE “(Participant 16)

4.3.5 Influence of the inspectors

Some of the participants expressed that the changes made in SIRE 2.0 implies more surveillance of the inspectors rather than contributing to increased safety:

“Take away the requirements that are not targeting safety” (Participant 17)

“How do we find the middle way between the experience based onboard and an experience Inspector without losing any one's perspective?” (Participant 22)

“[The new changes will arise to opportunities such as] more of equal vetting inspections, so the vetting inspector does not affect that much your observations, [in] that [way] it will get more equal.” (Participant 19)

Some participants implied that the influence of the inspector and the pre-biased comparison with other ships is crucial if the inspected vessel gets an observation or not:

“The inspectors are not as free to formulate their questions so it will be easier to "study" in advance [...] get rid of personal opinions from inspectors [...]” – (Participant 181)

5 Discussion

This chapter is divided into two parts. The first part discusses some of the most important results while the second discusses the method chosen for this thesis.

5.1 Results Discussion

5.1.1 Shifting to human-centric approach

While discussing with INTERTANKO and OCIMF it was noticed that there was a need to adapt to the technological changes that Industry 4.0 (Sullivan et al., 2020) is bringing to the shipping industry. Considering Industry 4.0 as a concept that is revolutionising every production and service sector, it is only natural that it would bring change to the shipping industry too.

Combining the opportunities of tracking, data sharing and reporting, with the plateaued performance of accidents in the shipping industry OCIMF has introduced the new inspection program, SIRE 2.0, although not yet launched as of conducting this thesis. Even though it was not the thesis intention to look into and analyse the motives of OCIMF in introducing SIRE 2.0, it should be noted that moving to SIRE 2.0 is not only a change for the shipping companies but also for OCIMF and the vetting regime. SIRE 2.0 will allow the enhancement of the inspection process by providing a standard way of conducting inspections. This will be done through data reporting, sharing and tracking of vetting inspections. Which gives the understanding that there will be no room for false reports and cheating by not performing the process but still submitting a report. However, there is high concern regarding the subjectivity of the inspectors since his or hers attitude and personality in assessing the state of the vessel from a technological, hardware and organisational (human perspective) will reflect on the submitted report which consequently will have an impact on the reported safety standard of the vessel of the vessel (Samagaio & Felício, 2022). Different standards within the segment might affect the subjectivity of the inspector, i.e., comparison between a brand-new tanker vessel and an older one. The economic stability of the company and its ability to maintain the crew as well as the vessel reflects those attributes.

This concern relates the most to the assessment of the seafarers' psychosocial conditions. According to (Wagner & Wiśnicki, 2022) the advancement the shipping industry is facing with new technology implemented in the working environment is more comprehensive than before. This implies that more technical skills are acquired by the people working within shipping, regarding both shore-based personnel and crew onboard. Since the industry is moving far more over to being more reliable on technology and AI, the human role onboard a vessel is drifting far moreover in becoming qualitatively assessed. To enhance the quality of operations and prioritize human-centric approaches, it becomes necessary to revise existing procedures during the onboarding process. This is crucial because the advancements in technology have outpaced the proficiency of individuals operating it. It is important to note that most of these systems are developed by engineers with expertise in data and information technology, while seafarers may not possess the same level of familiarity (Hignett et al., 2015a). Soft skills, such as leadership skills, being resilient, cultural differences etc, have shown to be more and more required in an abundant world of technology. These soft skills, and many more, are to be shown throughout every step of the ranking system onboard a vessel for the system to work. Taking soft skills and human behaviour into consideration in establishing a working and efficient on-board operating system, it is argued that the assessment of such system's effectiveness is a delicate matter and should be done from those who have had the appropriate education. Therefore, it is critical that

an assessment is conducted by those who have had the appropriate education and right skills to assess the functionality of a system (i.e., vessel) that includes an element which they are experts on. For example, it might be more suitable if inspectors with a seafaring experience who are experts in the technical and navigational matters, could be supported by equally skilled experts in human behaviour and soft skills. That way current inspectors can focus their skills on what they do best, while psychosocial conditions are assessed by experts in that field.

5.1.2 Psychosocial Interventions

Literature has shown that there are regulations in place for ensuring that the human on board is well taken care of. With mandatory (i.e., ISM code, flag state) and voluntarily compliance (i.e., ISO 45001) shipping companies are expected to have processes in place for ensuring, monitoring and assessing the work environment on board vessels so that psychosocial conditions are embedded in the action plans of the companies for ensuring a safe working environment. Considering that the establishment of an SMS is mandatory according to the ISM code and that SMS relates to the quality performance of the shipping company, it is the company's responsibility to continually improve actions for maintaining and protect the mental health of the crew as part of safety precautions.

During focus group interviews Group 2 explained that in terms of ensuring the wellbeing of the crew, SIRE 2.0 will not lead to any internal adaptations since procedures concerning psychosocial conditions of the crew are already in place and in some cases even been thoroughly worked during the corona pandemic. It should be noted that this attitude towards HR management represents only the focus group 2 of this thesis and thus might be different for other companies.

As stated in the STCW and supported by Martes, 2020, training of seafarers is vital in order to retain competence and knowledge which are up to date with operational and administrative work conducted onboard. However, due to rapid advancement in technology, where technology and machines becomes more comprehensive and complex, more emphasises should be towards targeting those areas, meanwhile soft skill-competences, such as leadership and team dynamics, are demanded in order to tackle some of the mental disorder which (Pallotta et al., 2022) mentions are linked to loneliness and social isolation. The combination of the two will be addressed as lack of training in this concept due to the correlation between soft skills and technical skills. Working onboard requires both technical skills due to the high amount of advanced technology the vessels of today have, but it also requires soft skills, such as understanding of team dynamics and understanding cultural aspects (Liu, 2018; Włodzimierz & Szczepanek, 2022).

Several of the articles found in the literature reviewed demonstrated that there is a lack of scientific articles regarding proper implementation of the International Safety Management Code (ISM code) and conventions with reference to working and living conditions of crew (ILO 147). The literature review also indicates that a revision of the ISM code and more emphasis on enforcement of ILO 147 could further enhance the level of safety at sea. This enlarges the statement on why commercial inspections such as SIRE 2.0 should be performed and reviewed, and furthermore emphasize more with labour laws such as stated by ILO and in MLC. Some researchers argue that there should be higher emphasis on improving occupational health in shipping (Lucas et al., 2022) but the risk lies in overwhelming the seafarers with administrative work even more. There is no doubt that enhanced focus and actions towards occupational health is needed, however what the interviewees share is the additional paperwork that the shore as

well as the onboard personnel has to administer. In the end, this will not only raise workload, but it will also add to the already stressed seafarers, compromising therefore their health. This is another area where the participants showed concerns regarding the introduction of SIRE 2.0. Some researchers mentioned the concept of “skeleton crew” and combined it with the shortage of seafarers (Tang & Bhattacharya, 2021). A skeleton crew is a number of crew members that have been assessed and analysed to be the minimum required crew to operate the vessel safely. However, certain external and internal factors are not being taken into consideration when stating the minimum required seafarers. The skeleton-manning neither takes internal factors, such as sickness or fatigue, into consideration nor external factors such as harsh weather or visitors entering the ship ones at port. Having skeleton crew will affect the resting hours of the crew, which will have a direct impact on the onboard safety and awareness. This thesis asserts that for those ship managers that operate with a skeleton crew, the chances of getting a report with high observations from a human perspective are higher than others. Which is a risk of keeping the vessel on technical halt and thus not being able to contract it.

5.1.3 When voluntarily compliance equals business

Vessels already comply with international demands and flag state regulations, so why apply according to vetting? Since its introduction, the vetting inspection has helped to improve the quality of vessels in regard to operational performance. Processes and procedures have also been improved. However, it has also put a commercial demand on the shipowners to keep up with the demands from the oil majors. As this thesis states, the voluntarily but customer-required vetting inspection has been developed into a tool for the oil majors for creating a common ground of quality and safety demands. Still, these demands are oil-company specific and therefore commercially strong.

Shipping contracts may look different concerning details, nevertheless they serve as a buy and sell-contract e.g., cargo is sold by the owner to the highest bidder while a vessel owner looks for cargo to transport at a reasonable price that leads to profitable business. Between the cargo owner and ship owner, charterers are pressuring shipowners to act accordingly and comply with statutory and non-statutory requirements so that the vessel is ready for business (Karanassos, 2016).

The technical department of a ship management company is held responsible for the seaworthiness and cargo worthiness of the vessels as per national and international laws and regulations and requirements of port states, flag states, classification societies and lastly those of the charterers themselves (M. Panayides & Visvikis, 2017). This thesis argues that any modifications made to the aforementioned regulations and requirements necessitate a comprehension from individuals working in the technical department of a ship management company. This understanding is obligatory since there is no alternative but to incorporate these changes into the existing operations of the company. Staying abreast of and implementing alterations to laws, regulations and processes becomes essential for maintaining compliance and operational efficiency within the company.

5.1.4 Time to get everyone involved

For achieving increased ‘customer satisfaction’ in unstable shipping environments organizations should prioritize employee knowledge and education as well as quality practices of top management (Pantouvakis & Psomas, 2016). Constant learning of new skills allows employees to collaborate in many tasks and follow thus the top management’s willingness to

change which results in customer satisfaction, process management improvement and compliance with rules and procedures such as ISM and ISO (Psomas & Fotopoulos, 2010).

Due to a complex combination of improved technology onboard tanker vessels and vessel operators trying to cut costs, skeleton manning of tanker vessels is widely spread. Having skeleton crew will affect the resting hours of the crew and their ability to learn, which will have a direct impact on the onboard safety and awareness. This is not a concept only associated with working onboard, however, it might become more of an identity due to the working conditions are combined with the leisure and living conditions onboard (Rodríguez et al., 2012) As it is now, crew onboard struggle to get the proper resting hours acquired by law. This is due to the fact of operators manning their vessel with a so called “skeleton crew”. A skeleton crew is a number of crew members that have been assessed and analysed to be the minimum required crew to operate the vessel in a safe way. However, certain external factors are not being taken into consideration when stating the minimum required seafarers. The skeleton-manning does not for example take external factors into consideration, such as conducting a vetting inspection. Conducting an inspection puts strain on the entire crew but also enhances the workload on the shore-based personnel. With the upcoming changes introduced in SIRE 2.0, the workload is expected to increase which will have an effect on a vessel with already a few numbers of resources allocated and available. It is therefore important for ship managers and ship operators to build a common understanding of how the new vetting procedures will look like, and to communicate with masters and crew onboard the vessels. By doing so, gaps between resources allocated and resources needed for the inspection can be minimised, and the vessel gets a fair chance to be assessed accordingly, without having to compromise on the crews’ rest hours.

5.2 Method Discussion

To conduct this thesis, it was decided to use SIRE 2.0, a phenomenon which is not yet in place. This had initially affected the interest of individuals participating in semi-structured interviews and for those who decided to participate it meant that their statements were based only on speculations and personal opinions. Nevertheless, to ensure this thesis’ creditability, SIRE 2.0 was brought under the broader concept of introducing change in ship management operation and a higher emphasis on assessing the psychosocial conditions. The abductive research approach allowed the literature review in stages but only a single cycle of gathering empirical data and building on to theory was done. The researcher’s biases should also be considered as an unfavourable condition for completing this (Hesse-Biber & Johnson, 2015; Merriam & Tisdell, 2015). Semi-structured interviews allowed for an easier conversation flow where the interviewees shared personal opinions, experiences and expectations of the vetting system, SIRE and subsequently SIRE 2.0 while still following a script of questions same for all participants (Merriam & Tisdell, 2015).

The abductive research approach required the authors to do the literature review in stages. Based on the results from the interview, additional theory needed to be applied throughout the working process of conducting this thesis. This approach was beneficial due to the characteristics of the chosen topic. Since the information regarding the changes of the SIRE 2.0 programme is still being provided and revised, the abductive method allowed the authors to take part of new information provided by responsible parties (OCIMF) and add it to the theoretical framework. Furthermore, due to the small number of articles and information available on qualitative studies on previous vetting-programme and vessel inspections, the abductive method allowed the authors to revise the unit of analysis based on additional information from found in literature. This increased the credibility of the thesis and added support to the purpose of the thesis. The abductive approach did however affect the setting of

limitations. The limitations needed to be adapted towards new literature that the authors found based on the results from the interviews. This adaptation was at times time consuming, since revision of the thesis needed to align with the new theory. Although a quantitative research approach could give tangible results, it was decided to proceed with the qualitative approach because of the qualitative characteristics of the topic. In addition, since SIRE 2.0 is not yet implemented there are no published statistics or other numerical data that could be used for conducting the thesis quantitatively.

6 Conclusion

The purpose of this thesis was to explore the contribution that commercial, and customer driven demands brings to ship management companies. For the tanker segment, customer driven demands have a high influence on the operational business of the company as they, although not mandatory, put essential requirements, such as SIRE inspection, that serve as the indicator for commercial readiness i.e., “ticket to trade”. Which allows the company to continue its operational presence in the market. In the previous SIRE program (VIQ7) the assessment of the human performance was addressed just as “human factor” with no further investigation of underlying cause.

To conclude this thesis, the two research questions are answered followed by managerial implications and recommendations for further research.

RQ1 – How does the legislative regime regarding psychosocial aspects affect the shipping companies?

Shipping companies deal with the complex borderline between complying with legislative as well as aligning with commercial demands. Frequently commercial demands are often above the legislative standard. This thesis shows that shipping companies where processes and procedures exceed the minimum regulatory requirements regarding the occupational health and safety environment will set the new working environment standards for shipping operators. Furthermore, by being in line with the commercial requirements set by the industry, these companies will set the new standards for shipping operators. By raising the international level of the legislative regarding occupational health and safety, and incorporate human elements into the legislative, the shipping industry as whole will benefit from the outcomes. Shipping companies can address and work with psychosocial aspects to address issues experienced such as mental disorders amongst seafarers. This thesis shows that a subjective evaluation of the vessel as well as the performance of the crew should be considered as an external risk that the organisation should take into consideration.

RQ2 - How can investment and measurement of psychosocial practices be part of the business performance of a shipping company?

This thesis indicates that being able to assess human performance and investing in the wellbeing of the crew can predict the performance of the vetting inspection from a human element perspective. By assessing, communicate and incorporate procedures which targets the human element and psychosocial conditions amongst seafarers, shipping companies will be more resilient towards the complex changes the shipping industry is facing and will also be more resilient to meeting customer demands. As results has shown, participants focus a lot on the wellbeing of the crew which can be a reason to argue that they have high focus on ergonomics too. Research has shown that ergonomics can work together with quality in a company. As inspection reports show the quality and safety standard of a ship and with the new SIRE

inspection program the quality and competence of the crew as well, thesis argues that quality improvement (i.e., increasing the quality standard of the vessel) and HFE can work together. Since ISO 9001 is highly implemented in the transport industry and considered as a key ISO standard that a company should comply too (Islam & Zunder, 2014) HFE experts and those trained in QIS should work together and develop opportunities for integrated education and training. Although this view and collaboration has been mentioned during the interviews it is to be still examined in what extent and on which life cycle steps of a ships it is applied. The scope of both HFE and Quality improvement is similar e.g., to engage stakeholders in identifying problems and developing solutions. While quality improvement incorporates a continual cycle of Plan-Do-Check-Act on process improvement, HFE focuses on continually improving the wellbeing of the human. Therefore, organisation can benefit from the HFE ability to improve the organizational environment (Hignett et al., 2015b). As looking into psychosocial conditions is becoming a trendy topic in the maritime industry, it is now seen with SIRE 2.0 that customers to emphasize on the assessment of such conditions, mostly due to the commercial benefits. Even so, it is a motivation and an additional reason for organizations to seriously consider the well-being of their employees as an investment. That being said, this thesis suggests that a company should assess factors that impact the health of employees in the workplace. Therefore, RQ2 is answered by arguing that organizations should incorporate a thorough risk assessment of psychosocial internal and external factors as part of the company's business risk management.

6.1 Managerial implications

From a holistic business perspective when new regulation and external requirements are announced it is the company's task to figure out a compliance plan. Especially when external requirements are vital for commercial activities. This is now seen with SIRE 2.0 and shipping companies in the tanker segment. Thus, transitioning to SIRE 2.0 should include action plans that ensure compliance but do not compromise existing well-established operations. It is important that the transition happens in such way that fits the organizational structure and culture of the company. It is also critical that shipping companies take the human element into consideration when performing risk assessments. By including the PIFs presented by OCIMF on the human element into their risk management plans, shipping companies can continuously work with allocating risk associated with human element.

6.2 Recommendations for further research

The authors suggest that companies' implementation of SIRE 2.0 could be studied to evaluate what the changes resulted in. Once the new version of the SIRE program is implemented, a quantitative method could be applied to address the amount of satisfaction level of the implementation or to compare the correlation between vessels' performance under the old version of the program (VIQ7) and SIRE 2.0. The authors further suggest that the same study could be applied to companies with other demographic characteristics, i.e., organisational culture, fleet size and location. This thesis does not dive deeper into quality management practices in ship management except that of ensuring a high-quality standard for the ship due to commercial reasons. Therefore, studies could be made on how the psychosocial factors of the crew members, which will be assessed once the new SIRE inspection regime is launched, can be part of continuous improvement process which the company follows. Regarding training of crew on the matter of psychosocial work environment, the authors recommend a follow-up on STCW added changes to its convention regarding psychosocial work environment and implementation of training targeting human element. Another recommendation is to research on how a system for psychosocial risk assessment might look like for the ship management

business. If such research is conducted its purpose will be to find out how the company can predict the influence of external requirements could have on the mental health of seafarers.

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APPENDIX - A Example of TMSA Elements

Element	Content	Main objectives/Aim	KPI's (examples, at least one from each stage)
Element 1]	Management, leadership and accountability	<p>Provide direction and clearly define responsibilities and accountabilities at all levels within the organisation/</p> <p>1) Through strong leadership, management promotes safety and environmental excellence at all levels in an organisation</p> <p>1A) Management accepts responsibility for developing and maintaining a dynamic (documented in hard-copy or electronic format) safety management system to implement policy and deliver safety and environmental excellence</p>	<p>1) Management commitment is clearly defined in documentation that includes mission and vision statements, policies and procedures</p> <ul style="list-style-type: none"> - All company personnel can describe what safety and environmental excellence means in practice - Shore management sets company standards and performs assessments to verify their implementation - safety and environmental performance targets are monitored against KPI's[Textbrytning]1A) <p>Management ensures that policies cover all the activities undertaken by the company</p> <ul style="list-style-type: none"> - Instructions and procedures are written in plain language and contain sufficient detail to ensure that tasks can be completed correctly and consistently - Instructions and procedures covering shore and vessel operations are developed in consultation with those who will have to implement them - Senior managers have a mechanism in place to verify the effectiveness of key areas of the safety management system
Element 2	Recruitment and management of shore-based personnel	<p>Ensure that the fleet is supported by competent shore-based staff who are committed to a high standard of fleet management/Ensure that the fleet is supported by key staff who are competent to carry out the full range of responsibilities and tasks</p>	<ul style="list-style-type: none"> - The pre-recruitment process should include checks that applicants have the appropriate qualifications and experience - The average job retention rate for key staff (such as superintendents) is greater than 70% over a two year period, other than planned attrition - Key staff retain core technical skills through new training,

			<p>refresher training and participation in industry forums, seminars and conferences</p> <ul style="list-style-type: none"> - The company encourage and supports personnel taking higher education courses to improve their value to the company and their possibilities for promotion within the organisation - senior on-board personnel are rotated through office assignments - the company promotes appropriate interpersonal skills training
Element 3	Recruitment and management of vessel personnel	<p>Ensure that all vessels in the fleet have competent crews who fully understand their roles and responsibilities and who are capable of working as effective teams/3. Ensure that all vessels in the fleet have competent crews who fully understand their roles and responsibilities and who are capable of working as a team/3A. Ensure that all vessels in the fleet have competent crews with an emphasis on senior officers who are committed and motivated through encouraging job satisfaction</p>	<p>3) Management has defined a system of selection, recruitment and promotion procedures</p> <ul style="list-style-type: none"> - The company has an extended recruitment and interview process for senior officers - Selection, recruitment and promotion procedures ensure appropriate staff placement with documented appointment records - Vessel operators conduct an annual review of the crew selection and recruitment process to ensure that it complies with their policies and procedures - The company has a documented planning process to ensure that future manning needs can be met - The company undertakes vessel health-risk assessments on a rolling basis - Appraisal and competence development processes for vessel personnel are linked to future training and promotion requirements <p>3A) Shore management provides adequate resources to ensure the well-being of crews</p> <ul style="list-style-type: none"> - There are procedures to ensure that the working and rest hours of all personnel are in line with STCW or relevant authority guidelines for the vessel trade and are being accurately recorded - The company has procedures to identify additional training

			<p>requirements</p> <ul style="list-style-type: none"> - Crew training includes the use of audiovisual training aids and/or computer based training - The company organises senior officer seminars to promote, emphasise and enhance the company's safety management system - Training for seafarers exceeds the minimum requirements of the STCW or of the relevant authority for vessel trade - Company policy provides career opportunities for officers by providing shore-based assignments
Element 7	Management of change	<p>Establish procedures for evaluating and managing changes to operations, procedures, vessel equipment or personnel to ensure that safety and environmental standards are not compromised/7) A management of change process is in place and operates effectively to reduce operational risk/ 7A) A management of change procedure is in place to assist staff in identifying hazards and to reduce operational risks and key tool for this is Risk Assessment</p>	<p>7) The management of change process clearly defines the level of authority required for the approval of change</p> <ul style="list-style-type: none"> - the company uses techniques such as risk assessment to evaluate the impact of proposed changes - The system ensures that training needs arising from changes to equipment or procedures are identified and documented - Procedures include provisions for the familiarisation of superintendents and crew with newly acquired vessels entering into the fleet ownership/ management - For major changes to the shore organisation, the management of change procedure should require a detailed review of the impact on the organisation and on the management system <p>7A) The vessel operator has a management of change process that ensures all temporary and permanent changes to procedures or equipment onboard the vessel are subject to risk assessment</p> <ul style="list-style-type: none"> - The system ensures that the documentation supporting a change includes the reason for the change, a clear understanding of the safety

			<p>and environmental implications, and the appropriate level of approval</p> <ul style="list-style-type: none"> - The management of change process ensures that any changes made are communicated to personnel affected by the change - The system ensures that changes not carried out within the proposed time scale are reviewed and revalidated
Element 8	Incident investigation and analysis	<p>Use effective investigation, reporting and follow-up methods to learn from significant near misses and incidents, and thus prevent recurrence/ 8)</p> <p>Comprehensive procedures are prepared and maintained for incident investigation and analysis/ 8A) Training is provided for both vessel and shore-based management teams in incident investigation techniques</p>	<p>8) The reporting procedures ensures any breaches of regulations are identified</p> <ul style="list-style-type: none"> - The vessel operator uses the conclusions from the investigation to reduce the risk of any recurrence or related incidents - The incident-[Textbrytning]investigation process ensures that the root causes and factors contributing to an incident or accident are clearly identified - The vessel operator has procedures to share lessons with industry groups, where appropriate, as well as with oil-major vetting departments, where appropriate <p>8A) External training in incident investigation techniques, including root-cause analysis, is given to at least one of the shore-based management teams</p> <ul style="list-style-type: none"> - When new senior staff are recruited, they receive appropriate incident investigation training - procedures require that incident investigation refresher training takes place after an appropriate period
Element 9	Safety Management/9 - Shore-based monitoring / 9A- Fleet monitoring	<p>Develop a proactive approach to safety management, both onboard and ashore, that includes identification of hazards (including exposure to substances hazardous to health) and the implementation of preventive and mitigation measures/ 9)</p>	<p>9) Shore-based managers arrange regular onboard visits to monitor the safety standards and training across the fleet. a formal record of these visits is kept within the office</p> <ul style="list-style-type: none"> - The vessel operator's procedures includes a documented risk-assessment process to systematically identify potential

		<p>The vessel operator has a comprehensive and proactive approach to the identification of potential hazards and the shore-based management of operational risks/ 9A) The company has comprehensive and proactive approach to the identification of potential hazards and the management of vessel risks</p>	<p>hazards and manage operational risks fleet-wide</p> <ul style="list-style-type: none"> - Records of all valid /current risk assessments are maintained at relevant locations - Senior management establishes and supports proactive safety campaigns - appropriate company representatives make extended visits to all vessels within the fleet to confirm safety standards an ensure that safety training programmes are effectively implemented - Company management reviews and collect all on-board risk assessments to check that standards are consistent <p>9A) The responsible officer conducts safety inspections at scheduled intervals and the results are recorded</p> <ul style="list-style-type: none"> - There is a formalised system onboard to identify hazards (hazard identification) during work planning - The vessel operator has a formal documented risk-assessment process onboard, and relevant crew members have been trained in hazard identification and risk assessment - The vessel’s management team promotes a strong, proactive safety culture onboard, and all crew members are encouraged to be involved in proactive safety campaigns and work methods - Ther is a system in place for vessel staff to communicate ideas for improving safety to shore management
Element 12	Measurement, analysis and improvement	<p>Establish and implement appropriate measurements and feedback processes to focus on and drive continuous improvement/ 12) Shore-based management has a structured process for</p>	<p>12) a company specific format is used for conducting and recording vessel inspections</p> <ul style="list-style-type: none"> - The format is of a standard that is at least equivalent to the vessel inspection reports issued by industry bodies such as OCIMF,

		<p>conducting vessel inspection to monitor the condition of vessel in the fleet. Detailed reports and close-out plans are maintained ashore. The process includes identification of trends and provisions for promptly closing out and deficiencies that are identified/ 12A) The company has a structured process that allows management to conduct planned and systematic audits of all shore and onboard locations, such as those required under the ISM-code</p>	<p>CDI or EBIS</p> <ul style="list-style-type: none"> - The company analyses its inspection results and compares them with data from third-party inspections (such as SIRE, CDI or EBIS systems) and makes comparisons between vessels within the fleet, particularly with any vessels built to a similar design and specification - Information from the analyses of these inspections is fed into a continuous-improvement process - The results of vessel inspections are analysed to identify trends and common problems <p>12A) The company has an audit plan that covers shore and vessel locations</p> <ul style="list-style-type: none"> - Audit results are reported as soon as is reasonably practicable - Audit results drive continuous improvement of the management system
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APPENDIX B - Be our interviewee!

We are four students attending Chalmers University of Technology in Sweden that are writing our master theses based on the introduction and transition to SIRE 2.0.

Our aim is to highlight what factors or procedures could ease the transition and implementation of SIRE 2.0, for the shipping companies that are about to do so.

Although the information and videos provided on the OCIMF website has given us plenty of material to work with, we now would like to get your point of view!

We look forward to hearing your perspective on SIRE 2.0, your expectations on future vetting inspections, as well as any possibilities and challenges you and your company may anticipate.

Our main interests are the Performance Influencing Factors (PIFs) and the human response tool, but are grateful for any input we may get. We welcome the views from crew members, operators, inspectors / auditors, or any other personnel onboard and ashore that will be involved in the transition to SIRE 2.0.

The interview is estimated to take a maximum of 60 minutes and will be conducted digitally.

Please share your contact information in this form so we may contact you and schedule a meeting that suits you.

We are looking forward to hearing from you soon!

Our Best Regards,

Ina, Linus, Marianthi, and Ria

APPENDIX C - Ethical Rules applied in the project

1. Your participation is voluntary, and you have the opportunity to cancel your participation at any time during the project. You do not have to state any reason for doing so. Should you choose to cancel your participation, data linked to you will be disregarded from the study and the material will be destroyed.
2. No one beside the researchers will listen to any recordings. You are guaranteed anonymity in this project and emerging data reported, will be done without connection to ship, person, or shipping company. Your data will be coded, and the code key will be accessed and known by the researcher only. This coding will enable the possibility to contact you for any additional information, as well as identification of data linked to you in order to destroy it, should you choose to withdraw your participation in the study.
3. Emerging data in the project will be presented in reports, at seminars and conferences. At your request, you can read and approve the material ahead of publication.
4. None of your contact or personal information will be shared with any third party, nor used for any other purpose than the above stated. All personal data will be handled in compliance with the EU General Data Protection Regulation (GDPR) and in a manner that does not infringe personal integrity.

I have read the above information and choose to participate in the project
 I agree to the interview being recorded for analytical purposes

Place:	Date:
Signature:	
Name in block letters:	
Contact information:	

For additional information about the project, feel free to contact:
 Monica Lundh from the Department of Mechanics and Maritime Sciences at Chalmers University of Technology, by calling 031 – 772 60 61 or by email: monica.lundh@chalmers.se
 Henrik Ringsberg from the Department of Mechanics and Maritime Sciences at Chalmers University of Technology, by calling 031 – 772 18 64 or by email: henrik.ringsberg@chalmers.se
 or contact us: vetting.masterthesis@gmail.com

APPENDIX D - Interview questions

Now that you have given us permission to record this interview, we want to once again remind you that:

1. Your participation is voluntary, and you can choose to cancel your participation at any time during the project. You do not have to state any reason for doing so.
Should you choose to cancel your participation, data linked to you will be disregarded from the study and the material will be destroyed.
2. No one beside us four (Ina, Linus, Marianthi & Ria) will listen to any recordings, not read the transcripts. You are guaranteed anonymity in this project and if we choose to use anything you say in our study, it will be done without connection to a ship, person, or shipping company. Your data will be coded, and the code key will be accessed and known by us four only. This coding will enable the possibility to contact you for any additional information, as well as identification of data linked to you in order to destroy it, should you choose to withdraw your participation in the study.
3. Emerging data in the project will be presented in reports, at seminars and conferences. At your request, you can read and approve the material ahead of publication.
4. None of your contact or personal information will be shared with any third party, nor used for any other purpose than the above stated. All personal data will be handled in compliance with the *EU General Data Protection Regulation (GDPR)* and in a manner that does not infringe personal integrity.

1. Please explain your relationship with OCIMF? (collab/subordinate/member)

- 1a. How does OCIMF play a part in your day-to-day work?
- 1b. Are you (your company) a member of any association or forum that provides guidance regarding changes in the industry? (like INTERTANKO, BIMCO etc)

2. Please explain how you connect vetting to your (COMPANIES) risk management and performance assessment?

- 2a. What does your company structure look like, for those procedures?
- 2b. Do you have your own structure or do you acquire external support?
- 2c. Which departments are involved: preparing for/ pre-vetting/ actual inspection? (CHECK departments /roles - HR, Superintendent, DP, Fleet Technical Manager, Fleet Manager, Fleet Captain, Compliance Manager etc)

3. Means of communications:

- 3a. How are you getting information about non-statutory changes? (Mediums)
- 3b. When are you getting information about non-statutory changes? (Periodicity)
- 3c. When did you first hear about SIRE 2.0 (officially /unofficially + sources)

4. What were your first impressions?

- 4a. Are your initial impressions the same today?
 - if yes, why have they not changed?
 - if not, what are they and why did that change?

- concerns / challenges / possibilities

5. How does your company react to change:

- 5a. in general?
- 5b. regarding SIRE 2.0?
- 5c. Do you find the approach suitable?
- 5d. Will the changes in SIRE 2.0 change the company structure of how vetting is conducted?
- 5e. Concerns?

6. Are you pleased with the information and guidance provided by OCIMF so far? (positive/ negative and why)

- 6a. Are you pleased with the guidance provided by (previously mentioned associations? (positive/ negative and why?)
- 6b. What information or guidance is missing?
- 6c. What could be provided to make your work easier? (Info. /Guide. / Tools)
- 6c. When clarification has been needed, whom have you turned to?

7. What outcomes are you expecting with the new SIRE 2.0 (for the companies)?

- 7a. What actions are you expecting from the companies with the new SIRE.
- 7b. What will this mean for you / the crew or shore / the future of the industry?
- 7c. Are the new demands reasonable? Why / why not? Suggestions to differ?
- 7d. What consequences will the change to SIRE 2,0 when assessing human factors be, on a corporate level?
- 7e. What KPI: s will change with SIRE 2.0. and why/why not?

8. How do you define human factors?

- 8a. How do you (company) work with them?
- 8b. How do you interpret the human performance indicators being used and what are your thoughts on it?
- 8c. How will the PIFs affect the psychosocial work environment?
- 8b. What is your (company) strategy towards the new concept of “Human factors”?
- 8c. Some legislation/legislatives might follow the “Human factor” concept, what would your recommendation be for future work regarding this concept?

9. How have you communicated the new changes to your onboard crews (onboard colleagues if crew)? -What was the reaction?

If yes	If not - how is it going to be done?
What did they find being good?	What do you think they will like?
What did they find being bad	What do you think they will be reluctant to do?

9b. What specific preparations have you made?

(Education, recruitment of new personnel, informing the crew, educating them, new policies/policy development etc)

10. How do you allocate resources i.e., manpower, equipment for self-assessments/preparation/inspection?

11. What trending gaps in education have you identified in general?

11a. What will be needed besides the changes in SIRE 2.0? (Procedures, soft skills, teamwork, team dynamics and team cultures, technical skills)?

12. Looking at the PIFs, do you have an idea on how to work systematically with these and consider/define them into the psychosocial working environment working onboard the vessels - THE SMS (Systematisk arbetsmiljö/arbetsmiljöromd etc)

12 a. Do you have access to appropriate equipment and management instruments?

12.b. How will you address and act on future observations?

12 c. Whose responsibility will it be?

12.d How do you deal with the thoughts/concerns/questions from the crew?

12.e. Is there a strategy for how the crew can be supported in this transition?

Summary questions:

A. What in your opinion will be the largest challenge of the transition into SIRE 2.0?

Aa. Largest opportunity?

B. What in your opinion can shipowners and operators do to ease/streamline the transition?

C. What would you have OCIMF (+ any other org. named) done differently?

Ca. What would you wish for that would ease your work?

D. On a scale 1-10 where is current SIRE + SIRE 2.0? (Why the difference?)

E. What do you think SIRE 2.0 will lead to?

F. Do you think SIRE 2.0/vetting should not only be limited to the tanker sector? WHY?

G. How does your company generally react to change?

(attitude) Proactive - Neutral - Reactive- (Naïve)



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