

UNIVERSITY OF PIRAEUS



DEPARTMENT OF MARITIME STUDIES

M.Sc. IN MARITIME STUDIES

**VETTING AND TMSA: ROLE AND REQUIREMENTS
IN THE SHIPPING INDUSTRY**

Efstathia N. Karti

Masters' Dissertation

Submitted in partial fulfilment of the requirements of University of Piraeus for the degree of
Master of Science

Piraeus

June 2017

Declaration of Authenticity

The person preparing the thesis bears the responsibility of fair use of the material, which is defined on the basis of the following factors: the purpose and character of the use (commercial, non-profit or educational), the nature of the material used (part of the text, tables, figures, images or maps), the percentage and the importance of the text, which uses relatively to the entire text under copyright, and the possible consequences of such use on the market or the overall value of the copyright text.

Efstathia Karti

Members of the Supervisor Committee

This thesis has been unanimously approved by the three-member Examination Committee, which has been designated by Special General Assembly of the Department of the University of Piraeus, Department of Maritime Studies, in accordance with the Operating Regulations of the Masters' Programm in Maritime Studies.

The Committee members were:

- Professor T. Pelagidis (Supervisor)

- Professor S. Theodoropoulos

- Professor G. Samiotis

The approval of the Masters' dissertation by the Department of Maritime Studies, University of Piraeus does not imply acceptance of the author's opinions.

Acknowledgements

I am availing myself to express my sincere gratitude to everyone who helped me with this thesis.

Firstly, I would like to acknowledge my deepest thanks and gratitude to my advisor Prof. Theodore Pelagidis for the continuous support for his patience, all of his consistent guidance and valuable assistance throughout this process. It is a great honor to work under his supervision.

Besides my advisor, I would like to thank the rest of my thesis committee: Prof. George Samiotis, Prof. Sotirios Theodoropoulos.

It is with great pleasure that I express my deepest thanks and gratitude to Konstantinos Bernardos, the Technical Manager of Halkidon Shipping Corporation for suggesting the topic of this thesis as long as his encouragements, kind help and comprehensive advice and for all the ample time spent with me during this study. My sincere thanks also goes to HSC and the HSQE/Vetting department for the excellent and direct communication as well as the guiding pathways, which gave me throughout the study duration for the composition of this work proved to be more than essential for my thesis.

I thank my closest friends for the stimulating discussions, for their encouragement and for the worries we shared all this time. In particular, I am grateful to George P. for his consultancies regarding the structure of the thesis. Finally, I acknowledge and appreciate the valuable and continuous support of my family and beloved ones.

Abstract	8
Abbreviations	9
Chapter 1.....	10
1.1 Introduction	10
Chapter 2: OCIMF-SIRE	13
2.1 History of the SIRE Programme	13
2.2 Revisions to the Programme.....	14
2.3 SIRE	14
2.4 Benefits of SIRE.....	15
2.5 SIRE database and documentation.....	16
2.6 SIRE Documents	17
2.6.1 VIQ - Vessel Inspection Questionnaire for Oil Tankers, Combination Carriers, Shuttle Tankers, Chemical Tankers and Gas Tankers.....	17
2.6.2 SERM – Sire Enhanced Report Manager.....	17
2.6.3 VPQ	17
2.7 Vetting	17
2.8 The Multiplicity of Acceptability of Ship Inspections.....	20
2.9 Procedure of a typical Vetting Inspection	22
2.9.1 Preparation for the Inspection	22
2.9.2 Inspector on board.....	23
2.9.3 The Officer Matrix	26
2.9.4 Additional Documents.....	27
2.9.5 The Physical Inspection	28
2.9.6 Demonstrations	29

2.9.7 The Master’s role and responsibility	30
2.9.8 The Inspection Close – out meeting	31
2.9.9 The Response to the Inspection	31
2.9.10 The SIRE Report.....	32
2.9.11 The Screening Process	32
2.9.12 Approvals.....	33
Chapter 3 VIQ 6 OCIMF	38
Chapter 4:TMSA.....	44
4.1 Introduction	44
4.2 What is TMSA	45
4.3 Purpose and Scope.....	46
4.4 Benefits of TMSA	47
4.5 Continuous improvement	47
4.6 Measuring company’s management system status.....	49
4.6.1 The measurement processes	49
4.7 TMSA 3.....	51
4.7.1 TMSA SIRE Integration.....	51
4.7.2 TMSA Elements	52
Chapter 5: Importance of Vetting through case study presentation.....	67
5.1 Summary of Events	67
5.2 Company’s Navigation Procedures	68
5.3. Company’s Policy Regarding Employee Drug And Alcohol Abuse	68
5.4 Ship Management Details	69
5.5 Brief description of Company’s standards related to safety management system, maintenance and training.....	70

5.6 Manning	72
5.7 Bridge Team Management	72
5.8 Bridge Equipment.....	72
5.9 Potential Causes Examination	73
5.10 Root Cause And Contributing Factors	76
5.11 Root Cause Determination	76
5.12 Conclusions	77
5.13 Recommendations and Actions to be taken	77
5.14 Summary of actions taken or to be taken	78
5.15 Communicating the investigation results	80
5.16 Importance of Vetting	81
Chapter 6: Conclusions.....	84
Bibliography	86

Abstract

The main purpose of this thesis is to highlight the importance of Vetting, TMSA and the effect of their results to a company's overall appearance, economic growth, long term sustainability and commercial transactions with first class oil majors. Specifically, the second chapter refers to Vetting and its procedures, followed by a presentation of its main tool namely VIQ, the questionnaire through which an inspector accesses the nominated vessel. Furthermore, reference is made to the TMSA, which is the respective vetting for the office and is of the utmost importance for time charter contracts with oil major. However when it comes to a potential voyage charter the attention it is drawn to the fields of Vetting and respectively on the VIQ. Finally in the last chapter a case study is presented which aims to highlight the importance of vetting and TMSA for tanker operators aiming to fix potential businesses with oil majors.

Περίληψη

Ο βασικός σκοπός της παρούσας εργασίας είναι η ανάδειξη της σημαντικότητας του Vetting και του TMSA και των αποτελεσμάτων αυτών στην συνολική εικόνα, οικονομική ανάπτυξη και βιωσιμότητα των εμπορικών συναλλαγών με τις μεγάλες πετρελαϊκές εταιρείες. Συγκεκριμένα στο δεύτερο κεφάλαιο πραγματοποιείται αναφορά στο Vetting και τις σχετικές διαδικασίες και στην συνέχεια στο VIQ, όπου το συγκεκριμένο ερωτηματολόγιο ουσιαστικά αποτελεί το εργαλείο για την διεξαγωγή μιας επιθεώρησης στο πλοίο. Στο τέταρτο κεφάλαιο γίνεται αναφορά στο TMSA, το οποίο αποτελεί την αντίστοιχη επιθεώρηση του γραφείου, στο οποίο δίνεται βαρύτητα κυρίως στις περιπτώσεις επικείμενης χρονοναύλωσης και αντίστοιχα την επιθεώρηση Vetting για ναύλωση ταξιδιού. Τέλος, στο πέμπτο κεφάλαιο πραγματοποιείται παρουσίαση περιστατικού προσάραξης δεξαμενόπλοιου καθώς και οι επιπτώσεις αυτού στις επικείμενες ναυλώσεις των βαποριών της διαχειρίστριας εταιρίας με τις πετρελαϊκές εταιρείες.

Abbreviations

CDI – Chemical Distribution Institute

CoC - Condition of Class

D&A Policy - Drug and Alcohol Policy

HVPQ - Harmonized Vessel Particulars Questionnaire

IMO – International Maritime Organization

ISM - safety management system

KPI – Key Performance Indicator

MARPOL - International Convention for the Prevention of Pollution from Ships

OCIMF - Oil Companies International Marine Forum

OOW – Officer on watch

PPE – Personal Protective Equipment

PSC – Port State Control

SIRE - Ship Inspection Report Programme

SMC - Safety Management Certificate

SMS - safety management system

SOLAS – Safety of Life at Sea

STCW - Standards of Training, Certification and Watchkeeping for Seafarers

TMSA – Tanker Management Self Assessment

USCG - United States Coast Guard

VIQ - Vessel Inspection Questionnaires

VPQ - Vessel Particulars Questionnaire

Chapter 1

1.1 Introduction

Marine transport is a business that has an inherently high level of risk and although its main target and operation is to move cargo from one place to another in safe and cost effective way, this cannot be achieved unless these risks are identified and managed properly. Given that Shipping industry plays a key role in facilitating global trade, economic development and global prosperity, should focus on creating real and long lasting opportunities and we advocate a balanced, sustainable approach to our business, moving goods by sea is the most energy efficient and environmental mode of transportation. It is acknowledged that energy consumption and emissions and energy transportation should be even more sustainable by complying with all applicable rules and regulations and also adopting innovative measures. Ship owners and operators identify and manage risks in their operations on the basis of identifying hazards and then rating the associated risks to manage them through an effective cost/benefit assessment. In general terms, oil companies, other charterers and different stakeholders in the industry such as Port Authorities, Flag State Authorities, insurance companies, etc., also perform the same exercise, albeit from their own perspective within this operation. So, it is clear and obvious that in today's commercially competitive and socially aware world, managing and mitigating risk is becoming even more important for owners and operators as well as for every stakeholder involved in the operation.

When referring to the effective risk management is not only about safe operations but also efficient cost control and the overall process by which the oil majors, charterers and Port State Authorities review and manage risk when assessing a ship is known in the industry as 'vetting'. The ultimate benefit of management systems, as mentioned by Biebig (2008, pp. 266-267), lies in the proof that a company is able to perform on a high level of quality assurance which is the precondition to be part in several tenders. With regard to the tanker industry, we can see that the oil majors are looking for such high quality focused companies and therefore, vetting tanker operators according to in fact mandatory industry standards (Knowles, 2010). Consequently it is the case in the aforementioned industry that non-participation would ultimately disqualify a shipowner from the market. Vetting is a process within the shipping industry if a tanker vessel is inspected by or on behalf of a potential charterer, being an oil or chemical company. However the whole vetting process, is not only the physical inspection of the respective vessel, in fact, the performance of the tanker operator is also being vetted, by his track record and, nowadays, also by the TMSA. The inspection

results and the track records of the operator are than all assessed and additionally also other public available reports, e.g. PSC reports, are being used, in order to assess whether a vessel is suitable to be chartered by the respective party or not.

Shipping companies have been confronted with an increasing number and variety of requirements in ship management and ship operations. Vetting inspection is performed to ensure and measure the degree of implementation and effectiveness of arrangements in place. Oil majors have implemented a Ship Inspection Report programme and established a Vessel Inspection Questionnaire (VIQ) that sums up all items to be checked in a SIRE vetting. Sire Vettings are performed by professional inspectors with experience in the maritime world. Specifically, the actual physical inspection of the vessel's condition is only a part of this screening and risk management process - vetting. A process which includes not only all statutory requirements from Flag and Class, but also a significant number of other factors such as the assessment of adequate insurance cover, ISM, maintenance performance and records, communications, close-out and response to incidents, reports in the media, PSC detention and deficiencies, crew training and experience and many others.

Through vetting process, which is a commercial inspection it is achieved the classification of ships, classified them to sub-standard shipping and reward good quality ships and operations. Basically, through Intertanko it has been stressed the fact that is very important the using of common industry inspection standards. Intertanko supports, the use of the CDI Ship Inspection Reports (SIR) and SIRE Vessel Inspection Questionnaires (VIQ) and applauds the harmonisation, by the two organisations, of the CDI/SIRE Harmonised Vessel Particulars Questionnaire (HVPQ). During the last decades the shipping industry and especially the tanker industry has experienced a significant change in the direction to a quality orientated industry. It can be said that this was caused by the dramatic ship and especially tanker accidents in the 1980s and -90s. This change in industry behaviour has led to different tools in order to ensure quality with regard to a safe and environmental friendly operation of vessels. Vetting of tankers is a crucial part of this, also the International Safety Management Code referred to as: ISM Code has to be considered as an important part of this new quality orientated industry. Furthermore the tanker industry has established during the years the Tanker Management and Self Assessment (TMSA) in order to ensure that the tanker operators are complying with the ISM Code and additionally to mandatory high-level tanker industry standards. As already mentioned above major changes within the legal and non-legal framework applicable to international shipping has been always realised after dramatic ship disasters. This started with the introduction of the "International Convention of Safety of Life

at Sea" (SOLAS) in 1914, as a direct consequence of the Titanic disaster. A comparable old convention was the International Convention on Load Line Convention from 1930 which was introduced after multitude accidents occurred with overloaded vessels. These first international conventions were focusing on technology/construction and safety. The environmental protection came not on the agenda until the International Maritime Organisation (IMO) adopted MARPOL1 in 1973 and 1978 respectively. Consequential the following decades were concerned with the renewal of technical and safety related conventions as well with a strong focus on the establishment of international conventions focusing on environmental protection and regulation of compensation claims after accidents which have harmed the marine environment. International Convention for the Prevention of Marine Pollution from Ships (MARPOL). At the same time the industry became aware of its partly bad public perception. Especially the tanker industry was concerned about the increasing environmental pollution which became severe for the marine environment, due to the dramatic growing ships and the therewith growing sizes of pollutions. This assured the awareness that the industry had to be changed significantly. In addition to the growing size of pollution the dramatic changes in communications, especially within the globalization of media, underpinned the requirement for a major change of industry behavior. Thus, this example obtained a renowned exemplification with the disaster of the EXXON-Valdez, which obtained public attention which has been rarely seen by then.

Chapter 2: OCIMF – SIRE

OCIMF is a voluntary association of oil companies with an interest in the shipment and terminalling of crude oil, oil products, petrochemicals and gas, and was formed in 1970 in response to the growing public concern about marine pollution, particularly by oil, following the Torrey Canyon incident in 1967. OCIMF has become recognized voice of the oil industry for marine safety and quality matters, and is able to draw on reserves of knowledge and expertise within the membership to establish and promote the highest standards of marine safety and environmentally responsible operations worldwide. In recent there has been a steady growth in OCIMF membership which today includes all major oil companies and most National Oil Companies. Membership is culturally and geographically diverse with a broad pool of specialist marine expertise ranging from Arctic shipping to offshore support craft. Senior representatives from member companies OCIMF in various capacities, for example as Chairman or Vice-Chairmen, as members of the Executive Committee or other working committees, or advisers on specific issues. The administration of OCIMF is carried out by a Secretariat which supports the work of the Executive Committee and other standing committees. Member companies provide experienced professionals for secondment to the OCIMF Secretariat as technical advisers. Not only has OCIMF contributed to substantial quantity of regulation at the IMO aimed at improving safety of tankers and protecting the environment, but it has introduced important new guidance on pressing current issues. With the process of introducing new Internationally-accepted regulation necessarily slow as it crosses many individual countries and jurisdictions, OCIMF is in the unique position of being able to leverage the expertise of its membership to press ahead with much needs guidance on important industry issues. This provides the means to improve practices in the membership and in the wider industry, and serves as a valuable reference for developing regulation.

In addition to its extensive publications library, OCIMF has a wide portfolio of tools including its Ship Inspection Report (SIRE) programme, Tanker and Self Assessment tool (TMSA), Offshore Vessel Inspection Data Base (OVID), and the Marine Terminal Information System (MTIS), all of which have gained worldwide recognition and acceptance. The OCIMF membership is committed to continuing the development and publication of information and standards worldwide (INTERTANKO, 2015).

2.1 History of the SIRE Programme

In 1993, OCIMF established a Ship Inspection Report (SIRE) Programme, which enabled OCIMF members to submit their ship inspection reports to OCIMF for distribution to OCIMF

members and certain qualifying non-OCIMF members. Participation in the original programme, as either an inspecting OCIMF Member or a programme recipient, was strictly voluntary and each programme recipient determined independently how to evaluate the information contained in the reports received from OCIMF. Under the SIRE Programme, the operator of any ship that is the subject of a report was given a copy of that report and the opportunity to submit written comments relating to the report, to both the inspecting OCIMF Member and to OCIMF. Report recipients accessed the SIRE System Index by computer and this permitted the index to be viewed or downloaded. Programme recipients could order reports and any matching operator comments from the SIRE system. Reports and comments were transmitted by facsimile to the programme recipients' pre-registered facsimile numbers on request (VIQ 6, OCIMF 2014).

2.2 Revisions to the Programme

The original SIRE Programme was first revised in 1997 and introduced the means whereby programme recipients were able to receive reports and any operator comments electronically, as well as by facsimile. Specifically, two major changes were also introduced in the 1997 Revised Programme.

These were:

1. A Uniform Vessel Inspection Procedure and
2. A Vessel Particular Questionnaire (VPQ)

The SIRE Programme was again revised in 2000, the 2004 revisions made further important changes to the inspection procedure whilst also adding numerous new vessel types that are inspected under the programme. Collectively, these are referred to herein as “Vessels”. Subsequent revisions updated the VIQ questions and guidance, but did not add any questions. This 2011 Edition substantially changed the focus of the VIQ to increase the emphasis of the inspection on navigation procedures and cargo and ballast handling operations. Consequently significant changes have been made in this edition. In 2013 a further major revision of the VIQ was undertaken (VIQ 6, OCIMF 2014).

2.3 SIRE

One of the most significant safety initiatives to be introduced by OCIMF is the Ship Inspection Report Programme (SIRE). This programme was originally launched in 1993 to specifically address concerns about sub-standard shipping. The SIRE Programme is unique tanker risk assessment tool of value to charterers, ship operators and government bodies concerned with ship safety. SIRE itself is more specifically a database of ship inspection

reports which address issues regarding operational safety and pollution prevention. The SIRE system is a very large database of up-to-date information about tankers and barges. Essentially, SIRE has focused tanker industry awareness on the importance of meeting satisfactory tanker quality and ship safety standards. Since its introduction, the SIRE Programme has received industry-wide acceptance and participation by both OCIMF Members, Programme recipients and by ship operators.

Since its introduction, more than 300,000 inspection reports have been submitted to SIRE. Currently there are over 19,000 reports on over 7800 vessels for inspections that have been conducted in the last 12 months. On average Programme Recipients access the SIRE database at a rate of more than 10,000 reports per month. Today, SIRE inspections take place from the Pacific Islands to Rotterdam, from San Francisco to Melbourne and are widely recognized as invaluable tool for raising ship safety standards. At the core of the SIRE system is a large database of objective technical and operational data about a wide range of vessels used for carrying oil, gas and chemicals. The information helps inform vetting decisions on vessels ahead of charter as well as focusing attention on the importance of meeting and enhancing improvements in vessel quality and safety. Over the years the rapidly increasing use of SIRE information right across the globe has coming in line to the increasing efforts made by the oil industry to better ascertain whether the vessels they utilize are well managed and maintained. OCIMF member companies commission vessel inspections and appoint an accredited SIRE inspector to conduct an inspection. The inspector accesses the vessel particulars from the SIRE database along with the appropriate Vessel or Barge Inspection Questionnaires (VIQ/BIQ) before carrying out an on-board inspection of activities ranging from cargo handling processes to the vessel's pollution prevention measures. The resultant report contributes to the member company's risk assessment in advance of charter. The report is also uploaded to the SIRE database, where, for a nominal fee, it can be accessed by registered companies who charter tankers or operate terminals. Free access to all SIRE reports is provided to government agencies engaged in port state control activities (www.ocimf.org).

2.4 Benefits of SIRE

By establishing a standardised, objective inspection process that systematically examines tanker operations and that is shared by OCIMF members and other authorised recipients, SIRE has been a valuable tool in driving up expectations and behaviors relating to operational and safety standards in the industry.

Additionally, since its launch, SIRE has contributed to:

- Improved operational standards and a reduced number of incidents.
- The establishment of uniform standards and training for ship inspectors.
- A reduction in the number of repeat inspections on the same vessel, consequently reducing the burden on the vessel's crew (www.ocimf.org).

2.5 SIRE database and documentation

The central SIRE database houses in excess of 18,000 reports, user interface is possible 24/7 via a simple website replicated in London, Dallas (US) and Hong Kong and all reports are accessed electronically together with key documents such as the various VIQs/BIQs and crew matrices. Given that there is confidence in SIRE relies heavily on the quality and integrity of the inspection process, this, in turn, is supported by the Ship Inspector Training and Accreditation Programme which plays an important role in increasing and maintaining the skills of SIRE inspectors. So as a result, SIRE has now gained industry-wide acceptance as a benchmark for vessel inspections and standards.

The SIRE programme requires a uniform inspection protocol that is predicated by the following:

- Vessel Inspection Questionnaire (VIQ) – Uniform Sire Inspection Report
- Crew Matrix – Displays the current personnel rank and their seagoing experience on board the vessel
- Harmonised Vessel Particulars Questionnaire – HVPQ
- Web SIRE Enhanced Report Manager – WebSERM (Internet access to the SIRE system)

These requirements have been established to make the programme more uniform and user friendly and to provide a level of transparency unique in the marine transportation industry. SIRE has established itself as a major source of technical and operational information to prospective charterers and other programme users. Its increasing use corresponds with oil industry leads to better ascertain whether vessels are properly managed and maintained. OCIMF is in no doubt that better informed vetting decisions are leading to improvements in the quality of ships, accelerating its continuing drive for safer ships and cleaner seas. Inspection reports are kept on the live database and index for a period of 12 months from the date of receipt. All the reports which are over 12 months old are then archived for 12 months. SIRE access is available, at a nominal cost, to OCIMF members, bulk oil terminal operators, port authorities, oil, power, industrial or oil trader companies which charter tankers/barges as

a normal part of their business. It is also available, free of charge, to Governmental bodies which supervise safety and/or pollution prevention in respect of oil tanker/barges (e.g. Port State Control authorities, MOUs, etc.) (www.ocimf.org).

2.6 SIRE Documents

2.6.1 *VIQ - Vessel Inspection Questionnaire for Bulk Oil/Chemical Carriers and Bulk Oil Carriers*

The Vessel Inspection Questionnaire for Bulk Oil/Chemical Carriers and Bulk Oil Carriers (VIQ) is required for Inspectors to compile and submit SIRE inspection information. The VIQ addresses questions of certification, crew management, navigation cargo handling, mooring, engine room and steering gear and other aspects associated with safety and pollution. The VIQ is designed to be completed in electronic form by an attending inspector using a computer and specially developed OCIMF software and then submitted electronically to the OCIMF Member commissioning the inspection.

2.6.2 *SERM – Sire Enhanced Report Manager*

SIRE Reports and VPQs are available via the internet 24 hours a day, 365 days per year to qualified Recipients using the Sire Enhanced Report Manager interface (Web SERM). SIRE recipients are kept abreast of details of reports held in the database by means of a computerized index, which is updated continuously.

2.6.3 *VPQ – Vessels Particulars Questionnaire for Bulk Oil/Chemical Carriers and Gas Carriers*

The VPQ provides the means whereby ship operators compile ship particulars data using OCIMF software for electronic submission to SIRE, or directly online through the SIRE web site. The submission of VPQ data is obligatory if a VIQ is to be deposited. The VPQ contains many questions that deal with customary on-board documents and ship's particulars of permanent or semi-permanent nature that will reduce the inspector's time on board. This information will also assist a vetting department during vessel assessment and should reduce the need to complete separate technical questionnaires for individual charterers (INTERTANKO, 2015).

2.7 Vetting

Vetting is not subject to a common industry definition, but it can be said that in respect to the tanker to the SIRE system, the CDI vetting inspections are done by independent but accredited auditors. The processing of data is performed in a similar manner to the SIRE

system: they will be stored at an electronic database in order to make the inspections reports available for every member. However, under both schemes the database comprise only the raw-data, and, consequently, the judgment whether or not a vessel is suitable to be chartered is left to the individual member (Haralambides, 1998). Even it has to be said that this is de facto also correct for industry, the inspection of vessels by the charterer or an assigned third party is referred to as vetting. Consequently, the vetting process is a mandatory inspection of the individual vessel by the oil and chemical industry respectively and therefore, has to be seen as industry requirement. In fact, it is a compulsory industry audit and thus, absolutely independent from other inspections regimes, like Port State Control, ISM audits, etc. For the oil industry these vetting inspections are in general, undertaken by the individual oil major (e.g. Shell, Exxon-Mobile, and BP). However, in order to assure some degree of harmonization, the OCIMF as the industry organization has established the internet based database SIRE System and within this system the vetting reports, which were obtained by the individual oil major or by inspectors commissioned by them are stored and accessible for potential charterers. Regardless of the fact that OCIMF is also open for members from the chemical industry, the same has been established the Chemical Distribution (CDI), in contrast the SIRE system, however, the latter has one main difference, as the inspections are not done by independent auditors, at least the some oil majors are requesting their own inspection in order to not rely on the inspections done by their competitors. The underlying objective for vetting lies in the verification if tankers are complying with the compulsory international regulations as well as with industry standards and is thus, a rather unique tool within the maritime industry (Kaps, 1999). It gives the charterer a tool to vet a chartered vessels' performance and in fact how it complies not only with the aforementioned international regulations but also with much more strict industry requirements and guidelines before it is actually chartered. The whole vetting procedure was introduced in the tanker industry during the 1980s. Until this time, it was consensus that the safe carriage of cargo lied under the sole responsibility of the shipowner and the ship operator respectively, therefor it was commonly accepted that the charterer had very few measures available to secure a safe and successful voyage performance (Knowles, 2010). Knowles stated that "while this situation changed, there appears to have been no single reason for the development and introduction of tanker vetting". However, it is noted that this change in behavior concurs with the point in time where the oil majors were withdrawing their involvement from owning of ships to consequently mainly charter the required tonnage from independent, third party owners and operators respectively.

Compare also Oldham in he stated that in the mid 1990s less than 10 percent of the global tanker fleet were owned or chartered by the oil majors (Haralambides 1998).

This development from ship owning to "just" chartering a vessel shows the necessity of the vetting programs from the oil major perspective. As the oil majors were not longer in direct control of the fleet, it was of utmost importance for them to ensure specific safety standards, and this led to the establishment of the vetting procedure. As the underlying reason for vetting, Knowles (Knowles, 2010) highlighted the "growing awareness of the potential damage caused by pollution" and the "fear of large scale pollution". Charterers, i.e. the oil majors, became aware that there was an insufficient supply of well, safely managed vessels. He further states that this was not due to a lack of regulations, it was caused more by the lack of enforcement. Oldham had already stressed this lack of enforcement and required to "make life difficult for the offenders"(Haralambides, 1998). Today, it can be said that life has been made difficult, not only for the offenders. Through the fact that the vetting procedure has first to be passed before a vessel can be chartered, it can be concluded that the oil industry has set up a unique and effective "chartering 'filter'" (Knowles, 2010) which pushes operators to manage their vessels safely and to improve their performance continuously, if they do not want to jeopardize their business.

For the oil majors, the whole vetting procedure raised one main drawback which was already highlighted by Knowles and which has to be seen in connection to the fact that the charterer becomes liable for the actual performance of the chartered vessel and thus, for its crew and shore personal. This liability has to be seen in a wider context than the pure legal framework. Through the revolution in communication, an accident will be globally public within short time, and such an event will put pressure not only on the shipowner and ship operator, in fact, it will also put pressure on the charterer, i.e. the oil major because this is most likely a well known multinational company and, thus, much more present in the public perception. Thus, it can be concluded that the oil majors/ charterers have a financial interest that at the possibility that accidents are occurring is reduced. Knowles states that " the harder they (charterers) try to select tankers that meet high acceptance criteria, the more some organisations will seek to hold them responsible in incident occurs (Knowles, 2010). Within this section it has been showed that the vetting inspections were the first instrument in order to ensure a quality focus within the tanker shipping industry.

Vetting is not a simple one-step process. It seems as though a common misconception is that vessels pass a vetting inspection and subsequently are approved by an oil or chemical company for use. The process is in reality, much more complex than that and contains many more elements than the inspection itself. It is not enough that a vessel is appropriately classed or meets Flag State requirements but the vessel, as well as the company owning and/or operating it, should reflect best industry practice.

The vetting schemes in existence vary depending on several factors, such as type of cargo and vessel, but there are common denominators, such as the performance of a physical inspection with a subsequent inspection report entered into a database, mainly SIRE and CDI's electronic database. This inspection and selection regime differs from mandatory inspection and classification regimes. A vetting inspector cannot issue certifications or documents legally providing for the suitability of a vessel as classification societies can. Nor can an inspector detain a ship not in compliance with relevant standards. Additionally, vetting is not mandatory by law, the industry maintains it is not mandatory at all and should therefore create no legal liability.

2.8 The Multiplicity of Acceptability of Ship Inspections

Raising focus on the quality of ships and ship operations since the 1980s has resulted in an increase of the number of inspections that a vessel has to undergo. In our days, inspections are carried out by Flag States (and/or their delegated representatives RO's), classification societies, ISM auditors (internal and external), P&I clubs, charterers, terminals, Port State Control and different national coastguards. This increased focus and number of inspections can now result in tankers (oil, gas, and chemical) being routinely inspected and/or audited during each port call. This increase in the number of inspections was recognised by the majority of the tanker chartering stakeholders and was seen as an issue that needed to be addressed. As a result, the Oil Companies Marine Forum's Ship Inspection Report (OCIMF-SIRE) programme and the Chemical Distribution Institute's (CDI) ship inspection programme were conceived and developed. Although, these systems have helped in establishing common guidelines and standards of quality in shipping services, the acceptability of common inspection reports has yet to achieve its desired goal- the acceptance and use of all inspection reports by all stakeholders. OCIMF's SIRE and the CDI Programmes may have resulted in a reduction in the number of inspections however, progress has been restricted by the lack of trust between the various inspections entities and by the presence of differing requirements

between some charterers. Furthermore, the target by some is to have a near “real-time” snapshot of the ship and its operations has diminished the effective validity of SIRE report from 12 to 6 months. For instance in the parcel tanker trade above mentioned issue is magnified, vessels on these trades are designed to carry and transport many different cargoes on each voyage. Most of the times, these ships call at a number of terminals during the same port call and make a number of port calls during the same voyage. Consequently, this often leads in a ship having a number of charterers involved on a single voyage, resulting in the requirement for the ship to be “accepted” for the voyage not only by one charterer but by all the oil/chemical companies involved, as well as by the terminals that the ship may be calling at. In addition to the established SIRE/CDI inspections, the shipping industry is predicting an increase in the inspections being requested by terminals. Reports indicate that a significant number of smaller terminals are insisting on conducting their own inspections on the ships calling at their terminals.

In case of any one of the stakeholders (oil or chemical companies or one of the terminals) took part in the process does not consider the ship as “acceptable”, this impacts significantly upon the voyage as a whole and on the other parcels involved. Further complicating the overall process of achieving increased quality, safer ships and ship operations, are the lack of transparency, inconsistencies in the requirements of operational standards pertaining to “acceptability” and the validity of any a such “acceptance” that may be provided. Numerous cases are reported mainly due to lack of transparency, owners/operators are only advised at the very last moment that their vessels have been placed on a “technical hold”.

Specifically, Intertanko continues to engage and work with all the stakeholders involved in the ship inspection and vetting process to address the following concerns:

- The multiplicity of inspections, particularly in the parcel trade, with the objective of cooperation to recognise and establish common industry standards and to address operational efficiency in these areas.
- Response time from charterers following an inspection with regards to transparent communication of the vessels acceptability or not.
- Harmonised standards regarding incident reporting, the assessment of root cause analysis and correct identification of corrective actions.
- Establishment of a centralised incident reporting database to facilitate the transparent reporting of incidents to oil/chemical companies resulting in long delays or technical holds. This can discourage the very transparency we wish to promote.

- Oil companies regard Conditions of Class (CoC) as a risk, despite the assessment by the classification societies of the severity of these CoC's and the assignment of a timescale for fulfilment.

Inspections and audits remain a key element in assuring quality and the maintenance of standards. Through active and positive engagement with the various stakeholders, a better, more efficient system can be made to work (INTERTANKO, 2015).

2.9 Procedure of a typical Vetting Inspection

2.9.1 Preparation for the Inspection

The scheduling of an inspection is not always an easy task. There are various reasons why the vessels may not be inspected at the desired port. For instance:

- No inspector available
- Limited inspector resources at the desired port of inspection
- There may be security concerns in the region where the inspection is to be conducted
- The port is not in a location to allow convenient travel for the inspector e.g. restrictive visa requirements
- The requested oil major vetting department has no business need to inspect the vessel
- The vessel is loading and not discharging, the operation when most vetting departments generally prefer to inspect
- It may be less than 30 days since the last SIRE inspection
- The inspector's programme isn't in accordance with the vessel's schedule

The company (the vessel's Operators and Technical Managers) should always ensure that each tanker within its fleet has been provided with the latest version of the Vessel Inspection Questionnaire (VIQ) from the Oil Companies' International Marine Forum (OCIMF) or from the Chemical Distribution Institute (CDI). It is of major importance that each vessel is provided with the latest VIQ for an overall understanding of the inspection criteria and the guidance notes. Both senior and junior staff on board should have a copy of the areas of the VIQ sections that are applicable to their respective responsibilities. This will facilitate each to become familiar with their particular responsibilities as seen through the eyes of an inspector. The officers should fully understand and follow the guidance provided for each VIQ question that is applicable to their particular responsibilities.

Once the decision has been made to request an inspection, the company at the time of making the inspection request, should advise the vessel's Master to ensure all the vessel's staff are

fully aware of the company's intentions. This advice will also give the appropriate time for each of the ship's staff to carry out their own inspection using the information available in the VIQ, as previously mentioned to suit their particular responsibilities. This early advice also allows the Master and the senior staff to organize all documentation the inspector will require to review during this phase of the inspection. It is strongly recommended that the company lists the documentation and records the inspector will need to sight the initial inspection advisory message. In addition, any tip or advice learned from experiences as a result of previous inspections the company or ship may have undergone. Some vetting departments provide a similar list once the inspection request has been acknowledged and confirmed. Once confirmation of the inspection has been received from the inspecting company, all on board must be advised the inspection is going ahead as planned. Using the VIQ for guidance, the allocation of tasks for specific areas as agreed by the on-board management team and the company should cover all areas of the vessel (INTERTANKO, 2015).

2.9.2 Inspector on board

It is of the utmost importance the first impression that the inspector will gain and preferably we should strive so as to be a positive one, so it must be remembered that as soon as the inspector sees and approaches the vessel, the visual inspection begins. Therefore, it is imperative for all to be well prepared and to acknowledge that they don't get a second chance to create a first impression. From the first sighting of the vessel to arriving in the Master's/ship's office the inspector will have gained a first impression. Therefore, it is a priority that preparations must include the below specifications:

- The gangway/accommodation ladder is safely and correctly rigged
- Gangway warning sign for visitors posted and visible from shore
- The gangway watch is properly attired in correct personal protective equipment (PPE)
- The inspector is greeted with respect and requested for identification
- The gangway watch shall proceed with security checks, safety briefing, and ensure the inspector's mobile telephone is switched off
- The inspector should sign in and be provided with a visitor's badge (if this is the company's procedure)
- Once boarding formalities are complete, the inspector is escorted to the Master's or ship's office
- Provide the inspector with full co-operation, all necessary assistance and hospitality
- The inspector will discuss the purpose, route and likely duration of the inspection

- Inspectors will also advise what items of equipment will need to be demonstrated in their presence i.e. lifeboat engine, emergency generator, bilge separator and oil mist detector alarms, etc.

The following should be made available ready for the inspector's arrival. Howsoever, some may not be applicable to all tanker vessels. It is advised that it will be extremely beneficial to have all documentation readily available to expedite up the inspection process. Below there is a list of the aforementioned documents, such as:

1. **HVPQ**- An up-to-date Harmonised Vessel Particulars Questionnaire
2. The Operator's full style and contacts
3. **CSR** – Continuous Synopsis Record and attached forms
4. **DOC** – Document of compliance
5. **SMC** – Safety Management Certificate
6. **ISSC** – International Ship Security Certificate
7. The entire vessel's Class Certificates filed in the same order as displayed in the VIQ. Some port authorities will need to see the original class certificates in their offices. Therefore, it is strongly recommended that all class certificates are photocopied and available in the absence of the originals
8. International Tonnage Certificate
9. Minimum Safe Manning Certificate
10. **NLS** – Noxious Liquid Substances Certificate
11. Civil Liability Convention (1992) Certificate
12. P&I Club Certificate of Entry
13. **CoFR-US** Certificate of Financial Responsibility
14. Lifesaving and fire-fighting servicing certificates, including lifeboats on-load release mechanism
15. Port State Control inspection report file and evidence of close out of any deficiencies
16. Lifting gear register
17. The Operator's ISM/SMS manuals, either in hard copy or electronic versions
18. Records of Operator's representative visits to the vessel including those by the Senior Management of the company
19. Latest Operator's audit report and non-conformity close out evidence

20. Reports and correspondence of the Master's review of the safety management system
21. Latest Class Survey Status Report (must be less than four months old)
22. Class survey reports (annual, intermediate, special and occasional)
23. Records of cargo and ballast tanks, void spaces, trunks and cofferdams
24. **SEEMP** – Ship Energy Efficiency Management Plan
25. Garbage log book
26. Oil Record book I
27. **VRPs** – Vessel Response Plans applicable to the vessel as follows:
 - VRP in compliance with OPA 90
 - SOPEP- Shipboard Oil Pollution Emergency Plan
 - SMPEP- Shipboard Marine Pollution Emergency Plan
 - California Vessel Response Plan
 - Washington State Response Plan
28. Operator's Drug and Alcohol Policy
29. Trim and Stability Manual- approved by vessel's class
30. Damage Stability Manual – approved by vessel's class
31. Water Ballast Management Plan
32. Certificates of fire fighting equipment servicing
33. Certificates of lifesaving equipment servicing
34. Certificates of mooring lines, shackles and tails certificates, that clearly identifies the winch drums the are each fitted to
35. Certificates of emergency towing-off wires (fire wires)
36. Records of mooring winches Brake Holding Capacity (BHC) test records

Additional documents that required if applicable

- Certificate of Fitness for gas and chemical vessels
- Enhanced Survey Reports
- Executive Hull Summary
- **CAS**: Condition Assessment Scheme
- **CAP**: Condition Assessment Programme
- Thickness measurement report
- Oil Record Book Part II
- Cargo Record Book

- Inert Gas System Manual
- Trim and Stability Manual
- Damage Stability Manual
- Loading Computer Manual: approved by vessel's class
- Oil Discharge Monitoring Equipment Manual: approved by vessel's class
- Crude Oil Washing Manual: approved by vessel's class
- Water Ballast Management Plant (if fitted): approved by vessel's class
- Procedure and Arrangements manual (P&A): approved by vessel's class
- Bow chain stopper SWL certification

The publications library as provided in the VIQ, applicable to the vessel type oil, chemical or gas must be up to date:

- o Hours of work/rest records
- o Crew list
- o The on-line officer's matrix must be filled accurately and correctly, to satisfy some vetting departments it is recommended to include another line stating the total number of months served as a watch-keeping officer OOW/EOW (INTERTANKO, 2015)

2.9.3 The Officer Matrix

It is critical that the Officer's Matrix is properly completed and should be characterized by accuracy. It should be in accordance with the different crew matrix requirements of individual oil and chemical companies. Some information that are included in the officer's matrix are: rank, nationality, certificate of competency issuing country, administration acceptance, tanker certification, STCW V paragraph, radio qualification, years with operator, years in rank, years on this type of tanker, years on all types of tanker, months on vessel this tour of duty. However, operators may wish to add an additional line in their own company's officer's matrix to include the "actual years of sea service" as an officer on watch (OOW). This is beneficial as some vetting departments choose to evaluate the junior officer's experience levels in addition to the senior officers. Some charterers look negatively if there are too many newly promoted officers at the same time on board and will look at the officer's experience as an OOW, (cadet time excluded). Once completed, then the SIRE on-line Officer's Matrix must be updated. The on-line version of the Officer's Matrix has drop down lists and predictive text. The on-line version will also calculate all "Years" entries. The "ship operator

crew matrix” on both the CDI database and the SIRE database has been harmonized and this provides for a simplified solution to updating the crew matrix for both databases.

The details of the crew matrix can be completed on either the SIRE system or the CDI ISIS-XI system and the same data can then be imported/exported to the other system thereby reducing the administrative burden of repeating the process (INTERTANKO, 2015).

2.9.4 Additional Documents

The following documents should also be kept ready so as to be available in can the inspector request to sight at them:

- All ship’s officer’s and rating’s licenses and flag administration endorsed certificates of competence if issuing country is different than the flag state of the vessel.
- Records of:
 - each officer and ratings training courses attended, to include the ship’s Security Officer’s and Safety Officer’s personal training certificates
 - The last unannounced drug and alcohol test taken on board
 - the last announced drug and alcohol test taken by an external collector
 - on board inspection/ maintenance for fire-fighting equipment
 - on board inspection/ maintenance for lifesaving equipment
 - when the life boats have been waterborne
 - emergency drills carried out
 - pollution clen-up drills
 - safety committee meeting minutes and company acknowledgement of same
 - casualty/near miss file with evidence of the close-out
 - permit to work file, i.e. hot work, enclosed space entry, working at height, etc. including risk assessments for each
 - monitoring ballast and void spaces
 - records to indicate that portable instruments (O₂,hc, etc.) are regularly calibrated
 - cargo tank pressure sensor alarm settings (if applicable)
 - cargo, ballast tanks and void space inspections
 - pressure testing vessel’s cargo hoses (if applicable)
 - mooring winch Brake Holding Capacity (BHC) tests
 - SOLAS Training and Fire Training manuals

- Fuel, lubrication and hydraulic oil analysis

Some inspection companies require their inspector to collect copies of the following documentation. However, these requests are slowly reducing as more oil companies are becoming OCIMF-SIRE members:

- o Class Survey Status
- o Executive Hull Summary
- o Vessel Particulars Questionnaire
- o Officer's Matrix
- o Copy of Form B Supplement of the International Oil Pollution Prevention (IOPP) certificate
- o Crew list (INTERTANKO, 2015)

2.9.5 The Physical Inspection

After completing the Certification and Documentation section of the inspection in the Master's or ship's office, the inspection route will broadly follow this sequence: bridge, external accommodation, poop and main decks, including the forecastle space, pump room (if fitted), cargo control room, machinery spaces, galley and food handling areas, internal accommodation, interview the Chief Engineer with regard to planned maintenance and spares inventory levels, before completing in the Master's or ship's office for the inspection close-out meeting. During the overall inspection process the inspector must be accompanied at all times by an officer who is confident and capable of answering any questions asked. It is advised that this officer does not become distracted and get diverted away from the inspection process. The officer should simply answer each and every question as asked without feeling the need to expand on the answer given.

Should the officer accompanying the inspector be called away for other duties, ensure a substitute is made available first. The number of ship's staff accompanying the inspector should be kept to a minimum. As far as the navigation section of the inspection is concerned, the Navigation Officer will need to be present on the bridge supported by the Master.

The inspection of the machinery spaces the inspector will need to be accompanied by the Chief Engineer or 2nd Engineer, the Electrician may also be called up on to assist. The Chief Engineer may also be capable of demonstrating the vessel's Planned Maintenance System (PMS) and spare parts control system, depending on the inspector's preference, which may choose to check these items later as described above.

Whoever, is escorting the inspector in the around the machinery spaces must be wearing the appropriate safety wear (INTERTANKO, 2015).

2.9.6 Demonstrations

The inspector, as a minimum, will expect to see a member of the ship's staff demonstrate that is familiar with the use of the following equipment and in some cases certain items of equipment providing it does not interfere with the vessel's operations. The items of equipment to be operated and checked by the inspector will have been discussed during the opening meeting:

- Lifeboat engines
- Emergency generator using two separate starting methods
- Emergency fire pump
- Fan and fire dampers
- Funnel flaps
- Fire smothering systems- in case of water mist systems check the auto mode MUST BE selected
- Anti-pollution oil spill pumps
- Pressure/Vacuum (P/V) valve, always take into consideration H₂S content of the cargo. Only operate if it is absolutely safe to do so (high H₂S, toxants, etc.).
- Foam monitors
- Fire/foam deck main isolation valves
- Donning breathing apparatus
- Pump room entry procedures
- Pump room extraction fan high level suction flaps
- Cargo tank high level and overflow alarms (recommend advising the terminal first)
- Use of a portable oxygen meter to check O₂ content of inert gas being delivered to the cargo tanks
- Visual inspection of the fore peak and up to two other water ballast tanks from the deck level
- Inert Gas System alarm and set point

Inside the accommodation demonstrate knowledge and the use of:

- Navigational Equipment
- **EPIRB**- Electronic Position Indicating Radio Beacon
- **SARTS**-Switched Access Remote Test System

- Pyrotechnics
- **ODME** - Oil Discharge Monitoring Equipment
- Calibration of oxygen and combustible gas portable meters and use of toxic gas detectors and what calibration gases to use for each meter type
- Remote operation of the fuel oil tanks' quick closing valves
- Cold rooms locked-in alarms

Inside the machinery spaces demonstrate the use of:

- Bilge alarms
- Main/auxiliary engine oil mist detector
- Bilge separator 15 ppm alarm and 3-way valve
- Bilge well alarms
- Steering gear in normal and emergency modes
- Emergency air compressor (if fitted)
- High and low voltage earth leakage detectors
- Emergency fire-pump (if located in the machinery spaces)
- Planned Maintenance Systems records and class approval certificate (INTERTANKO, 2015)

2.9.7 The Master's role and responsibility

Throughout the inspection the Master will need to ensure that before inspector's arrival, all on board are aware of the upcoming inspection, which will be taking place at the port. It goes without saying that all ship's staff should be properly prepared and correctly attired with the Personal Protective Equipment (PPE). Furthermore, throughout the whole inspection the safety, security and well being of the inspector should be ensured and the inspectors are not questioned about their experience, ability and qualifications.

A ship's officer is provided to accompany the inspector at all times, however the inspector's requests for any testing should not interrupt or interfere to the safety of vessel's operations. Additionally, all ship's staff shall abstain from arguing with the inspector and answer all questions in a professional and honest manner. In case of an inspector that shows unreasonable behavior, the ship's staff should contact the company, so as any decision for further action to be taken by the company (INTERTANKO, 2015).

2.9.8 The Inspection Close – out meeting

The close-out meeting is an aspect of the utmost importance of the inspection and should be attended by both Master and Chief Engineer, this is the time when any observations made by the inspector can be reasonably discussed, which in some cases may result in observations being deleted. The purpose of the close-out meeting is to remove any doubt or misunderstandings to any observations the inspector has indicated during the inspection. It depends whether or not the oil major allows its inspector to leave a list of observations. Therefore, notes should be carefully written by the Master that can be accurately reported back to the company in detail. The Master or other attending officer at the close-out meeting should not be hesitant to ask the inspector to repeat and explain any observation that may have been raised. It is common knowledge that some observations reported by the inspector to be corrected at the time of inspection, this does not mean that the observation will be deleted from the eventual SIRE report. The observation will state what was observed and it was corrected at the time of the inspection. The company will still be required to provide a full response to the initial observation.

However, inspectors are not always correct and the observations they make should have a reference point i.e. based on the SIRE/CDI- VIQ, ISGOTT, MARPOL, SOLAS, etc. Without being argumentative the inspector can be challenged. This is particularly true if an observation is identified as being the inspector's opinion or is a subjective observation which is not based on one or more of the aforementioned reference points. In general terms, the close-out meeting should be carried out in an open and amicable manner. Upon completion of the inspection and close-out meeting the inspector should be escorted to the vessel's access point (gangway), after the inspector's disembarkation the Master should then complete and submit the INTERTANKO Inspector Feedback Form, in case that is not available, the company should provide it to the vessel. Finally, after leaving the port of inspection the Master should then complete and submit the INTERTANKO Terminal Vetting Report, which can also be provided by the office if not available (INTERTANKO, 2015).

2.9.9 The Response to the Inspection

A vessel does not pass or fail a SIRE inspection, instead, the inspector may enter observations, generally the ship owner or operator has 14 days to answer any such observations before the report is published and made available to all with access to the system. The comments are part of the report and it could either be a comment disagreeing with the findings of the inspector or a simple comment saying the observation has been

addressed and the problem solved. It is recommended for the company to wait until the full SIRE inspection report is received from the oil or chemical company who performed the screening of the vessel. On occasion it has been known that the list of observations left by the inspector sometimes varies considerably from those in the report, particularly should be any negative observations that can be corrected by the ship's staff, it would be prudent of the company to communicate with the vessel and, if required, provide the required guidance on what corrective actions and measures should be taken. The company when submitting its response should avoid from using replies as "corrected" or "fixed" or other short and uninformative response to an observation. The response to an observation should interpret the root cause, the corrective action and what has been done to prevent re-occurrence (preventive action) as well as how the lessons will be passed on to other vessels within the company's fleet. Prior to responding to observations in an inspection report, the company should conclude which observations are actual objective deficiencies and those that are simply observations and not require any corrective action. On the whole, the response to an inspection can be more important than the inspection itself, therefore the response must be accurate and above, all an honest one (INTERTANKO, 2015).

2.9.10 The SIRE Report

Although a SIRE inspection is available on their systems for 12 months, it is commonly regarded by a majority of vetting departments that a SIRE Report or CDI Report if it is about a chemical tanker, along with the manager's response has a "shelf life" of six months from the date of the inspection. Therefore, it is suggested, while taking into account the specifics of a vessel's trading patterns and in some cases age, to arrange inspection frequency at four to five monthly intervals. In this way it is ensured that there is always a fresh and up to date report and company response available for any OCIMF-SIRE or CDI member to access for its own evaluation (INTERTANKO, 2015).

2.9.11 The Screening Process

It is of the outmost importance to conceive that the actual vetting inspection is only a part of the screening process, the completed SIRE Report does not contain any decision to the vessel's suitability to any particular vetting department or charterer. The final outcome of the inspection along with owners comments are used to assist with the actual screening decisions by each vetting department or charterer. Each of the oil companies, terminals, Port State Control, etc. (vetting group) that utilizes the risk management tool of vetting have their own

policies and systems that suits the individual needs of each. The SIRE or CDI inspection is part of the process of each vetting group, as many other aspects and considerations are taken considerably into account before the final evaluation and decisions is made to accept or not a vessel for its nominated use. The screening process begins with the company completing the on-line Harmonized Vessel Particulars Questionnaire (HVPQ) and Officer's Matrix, the company must keep both of these online facilities up to date. Up on to the completion of the above mentioned, there are three stages:

- First, an oil/chemical company carries out the inspection of the vessel
- Second, the inspector's report (along with any comments or observations) is available to the operator for their reference and response. The response from the company's side, commonly known as "Owners comments", will be uploaded onto the SIRE or CDI database, from which members of the SIRE or CDI system can download it as appropriate for evaluation.
- Finally, individual SIRE or CDI members, chemical companies, terminals, etc. can utilize the report to assist with making the eventual vetting decisions to satisfy their individual company policies.

Both SIRE and CDI systems involve the use of a standardized Vessel Inspection Questionnaire (VIQ) used by all the accredited inspectors.

2.9.12 Approvals

As far as the approvals, it may be that some organizations may still maintain a system of "approvals" by which a vessel is accepted by the organization for a certain period. The vast majority of SIRE members and in particular with the major companies involved, "approvals" are not given, this is simply an out of date term that is no longer in use by any vetting departments. In most cases the vetting department of an organization will only screen a vessel when it is proposed for a particular business by the organization's chartering departments. An actual screening decision will naturally be based not only on the inspection report but also (and not limited to), the individual vetting department's assessment of the company, the vessel's history, Port State Control record, terminal reports and also upon the particular business proposed, since the degree of risk involved will depend upon such things as the specific cargo, the loading and discharge ports, the length and route of the voyage, and indeed the time of the year. Also, different organisations may be willing to accept differing levels of perceived risk, for instance an oil major may consider an observation as a medium risk observation while an other oil major as a high risk one.

Although not exhaustive, the following is an example of what criteria may be used to evaluate a vessel's suitability:

- Class society – must be an IACS member
- Class survey status
- History of any recent changes of class
- Most recent dry dock and/or special survey
- Condition Assessment Programme (CAP)
- Vessel's age
- Type of hull
- Flag State
- History of any recent changes of flag state
- Casualty history data
- Classed for the cargo to be carried
- Current owners
- History of any previous owners
- Company responsible for the vessel's day-to-day operation, i.e. technical managers or operators
 - History of any previous technical managers or operators
 - Reputation of the technical managers and operators
 - Rating of the technical managers or operators as a result of a management review or audit by the vetting group
- Tanker Management Self- Assessment (TMSA) latest edition submission
- Officer's matrix
- Port State Control inspection deficiencies or detentions
- USCG inspection deficiencies or detentions
- Latest SIRE Inspection reports and company responses
- All recent (within 12 months) SIRE inspection reports and company responses
- Previous history of the vetting group's SIRE inspections and company responses
- Results of SIRE inspections and company response histories with regard all vessels in the company's fleet
- Terminal feedback
- Commercial feedback

- Suitable for the proposed terminals- size, mooring arrangements, draft, parallel body, etc.

At each and every individual vetting departments it may appeared some differentiations in the time span that they require an inspection to be held, in order to rely upon the inspection report. The majority of vetting departments will use for evaluation purposes a SIRE inspection report carried out within the six months. It is the policy of some vetting departments to access all of the available SIRE reports when evaluating a vessel that has been nominated for their fixtures.

On the whole, as it was previously mentioned it is of the greatest importance that each of the company's tankers has on board the latest OCIMF Vessel Inspection Questionnaire, there is no substitute for this publication and good thorough preparation (INTERTANKO, 2015).

The vetting criteria varies amongst the oil majors, but typically, in order to be considered acceptable to an oil major, a ship must satisfy the following criteria:

- there must be an up-to-date (no more than six months old) SIRE report evidencing minimal defects with the ship and it's on-board systems and maintenance;
- the ship must have a good safety record;
- the 'crew matrix' and shore-based management systems must be adequate; and
- any other ships within the same managed fleet should have a good safety record.

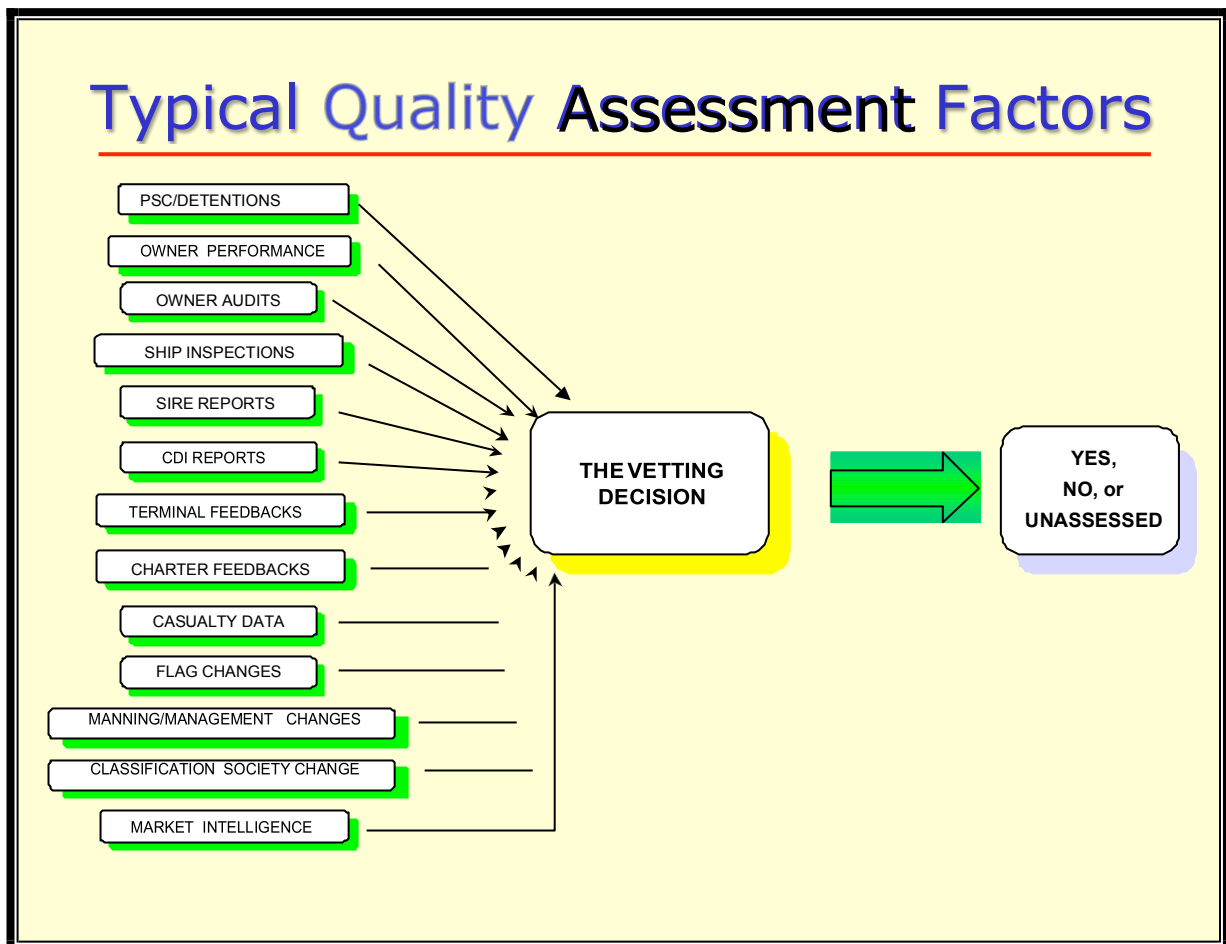
In general, the system is largely automated, in much the same way as 'credit scoring', although the actual decision to accept or reject a ship is usually made by an individual. Owners will be aware that oil majors do not automatically give reasons when they reject a ship, and on occasions where two different oil majors vet a ship simultaneously, owners may receive two different decisions. It is important to note that there is no 'one-size-fits-all' vetting system operated by charterers, rather they vary from company to company depending on the individual needs and management systems each company operates.

As far as the difference between vetting and 'approval' it is noted that before the *Erika* casualty in 1999, oil majors would often state that they had approved a ship for a fixed period. Now, 'approval' is usually only given for a particular voyage. Following a positive vetting, an oil major may simply write to the owner stating that no further information is required and the oil major will not re-inspect the ship for a certain period.

However, no blanket approval lasting for a fixed period of time is given.

Confusion often arises, therefore, when ships are marketed as having ‘oil major approvals’ which are stated to be valid for a certain period. In such cases, owners and brokers are often referring to the period of validity of a SIRE inspection carried out by the oil major in question. In reality, an owner cannot be certain that the ship is acceptable because, as well as looking at the ship itself, an oil major will consider the cargo, and the load and discharge ports on a case by case basis. Each oil major will give different weight to the various criteria, thus the same ship may even be accepted by one oil major and rejected by another on the basis of the same SIRE report (Helen McCormick, 2012).

Figure 2.1: Typical Quality Assessment Factors



Source: International Oil Pollution Compensation Fund 1992, (2004)

As can be seen from the figure above, the vetting decision will take into account an assessment of a wide range of possible inputs. Depending on the individual system, some of these will be more highly valued in their influence on the final decision. Key factors normally considered by OCIMF members will however include the following:

- Vessel owner/operator performance assessment and rating.
- Incidents and Casualty reports.
- Vessel inspection and condition assessment data.
- Port State Inspection performance and detentions.
- Terminal performance and feedback

Chapter 3: VIQ 6 OCIMF

Within this chapter, a short overview of the VIQ's chapter and is given, firstly focusing on the way that this questionnaire is utilized by the possible inspectors and in the second part of this chapter on the contents and the areas referred on the VIQ. The inspection questionnaires used in the SIRE programme contain a series of questions related to safety and pollution prevention applicable to the type of vessel that is inspected. These questions are consecutively numbered and are logically grouped into separate chapters. Each chapter contains a series of questions to be answered by the inspector. Questions may be accompanied by guidance, namely:

1. Guidance notes to inspectors
2. Reference sources citing regulations or industry guidelines pertaining to questions and
3. An indicator to identify issues when an inspector comment is mandatory

If the guidance and references lead the inspector to conclude that the question should be answered positively, the box "Yes" in the VIQ computer programme should be checked. On the other hand, if the guidance and any reference sources indicate to the inspector that the question should be answered negatively, the "No" box should be checked. Where appropriate, the "Not Seen" or "Not Applicable" box should be ticked. The inspector must respond to all the questions appropriate to the type of vessel being inspected. Failure to do this will mean that the inspection report cannot be transmitted to the SIRE Internet site for processing by the principal who commissioned the inspection. The inspector must insert an Observation, when responding to any question where the response box is marked "No". The Observation must specify and explain the reason why a negative response is made. Additionally, where a box is marked "Not Seen", the reason for the "Not Seen" response must be given in the Observation section accompanying the question. In cases where a "Not Applicable" response is required, the "Not Applicable" response is treated in the same way as a "Yes" response and there is no requirement for the reason to be made in the Observations section accompanying the question. However, if, in the inspector's judgment an explanatory comment is necessary, the inspector may make such comment in the "Comments" section accompanying the question provided such comment makes amplification to assist the understanding of a report recipient as to an issue associated with a specific question. In some cases, where the type of vessel being inspected results in one or more questions being not applicable to that type of vessel,

the Report Editor is programmed to automatically answer those questions “Not Applicable”. In many cases, the question does not have a “Not Applicable” option.

The VIQ is composed of 13 chapters, particularly:

- **Chapter 1.** General Information
- **Chapter 2.** Certification and Documentation
- **Chapter 3.** Crew Management
- **Chapter 4.** Navigation
- **Chapter 5.** Safety Management
- **Chapter 6.** Pollution Prevention
- **Chapter 7.** Structural Condition
- **Chapter 8.**
 - Cargo and Ballast Systems – Petroleum
 - Cargo and Ballast Systems - Chemicals
 - Cargo and Ballast Systems - LPG
 - Cargo and Ballast Systems LNG
- **Chapter 9.** Mooring
- **Chapter 10.** Communications
- **Chapter 11.** Engine and Steering Compartments
- **Chapter 12.** General Appearance and Condition
- **Chapter 13.** Ice Operations

Particularly,

Chapter 1: General Information contains the informational responses required such as the Name of the vessel, IMO number, flag, deadweight, vessel type etc. and data related to the inspection like the date and time of the inspection.

Chapter 2: Certification and Documentation

It contains questions related to all the statutory certificates such as CSR, DoC, SMC, IOPP, Safety Radio Certificate by examining if there are valid, applicable and if the annual intermediate surveys have been carried out within the required range dates.

Moreover, in this chapter are checked the safety management and the operator’s procedures manuals like the SMS (Safety Management System), the operator’s visits.

Chapter 3: Crew Management

In this chapter there are questions related to the co-operation and communication between officers and crew and about the extent that all parties share a common goal to operate the

vessel safely and efficiently. For instance there are questions related to the Crew Management and if the regulations of STCW, MLC, flag administration are being followed. Furthermore, the courses and the trainings and the crew qualifications are being checked and if the operator's Drug and Alcohol policy meet the OCIMF guidelines.

Chapter 4: Navigation

Inspection of the bridge will normally take place when the vessel is alongside a terminal therefore the inspector must closely inspect charts, log books and other records to determine that the vessel has been safely navigated and that the bridge has at all times be adequately manned. As far as the compliance with the operator's navigation procedures should be evaluated both by observation and by discussion with the Master and officers. The operator's navigation procedures must be supplemented as required by the Master's Standing Orders and the Bridge Order Book and the main objective should be to ascertain that such policies are understood and are being complied with.

All navigation equipment should be in an operational condition regardless whether or not is required by SOLAS and any bridge equipment, which is not functioning, must be recording as an observation. In general, the questions of the Navigation Chapter are related to policies, procedures, documentation, equipment for navigation, charts and publications.

Chapter 5: Safety Management

In this chapter there are references regarding to safety procedures and issues like personal protective equipment (PPE), safety meetings, near misses, accidents, incidents, designated smoking areas. Moreover, it contains questions about drills, training and familiarisation of the crew about emergency procedures and examines the availability of ship security records, procedures relating to enclosed space and pump room entry procedures. Additionally, there are references about monitoring non- cargo spaces such as void and ballast tank spaces within the cargo tank block should be routinely monitored to check that no leakage has occurred from adjacent cargo tanks. Specifically, monitoring should include regular checks for hydrocarbon content and regular sounding/ullaging of the empty spaces, particularly to ensure that ballast, before it is discharged, is clean. Some extra points that are mentioned are the gas analysis equipment, the hot work procedures in accordance with the recommendations of ISGOTT and OCIMF guidelines, the state of life saving equipment and fire fighting equipment. Similarly, inspectors should examine the familiarity of the officers with MSDS (Material Safety Data Sheet) and if all means of access like the gangway, accommodation ladders are satisfactory.

Chapter 6: Pollution Prevention

Regarding to this chapter the inspector examines matters related to pollution prevention such as oil record books, shipboard oil marine pollution emergency plans (SOPEP) or shipboard marine pollution emergency plan (SMPEP). Furthermore, it should be examined if the vessel in possession of an approved Volatile Organic Compounds (VOC) Management Plan and if cargo operations, deck area pollution prevention and ballast water management are approved. Finally, are being checked the engine and steering compartments and if the garbage management plan and garbage record book are being correctly completed. Also, in this chapter is noted that the inspector should check if the vessel has a Ship Energy Efficiency Management Plan (SEEMP).

Chapter 7: Structural Condition

This chapter is associated with the enhanced survey programme file and if it is free from any information that raises concerns relating to the vessel structure.

Chapter 8: Cargo and Ballast Systems - Petroleum

Chapter 8, contains questions related to the policies, procedures and documentation that the vessel follow so as to ensure the safety of the cargo and ballast handling operations. Depending on the type of cargo that the vessel carries (Petroleum, Chemicals, LPG, LNG), there are some additional questions applied on each different type of vessel. Particularly, the questions aim to extract information with regards to verifying the good order and proper operation of the stability and cargo limitations, cargo operations and safety management, cargo ballast and monitoring equipment, ullaging, sampling and closed operations, venting arrangements, inert gas system, crude oil washing, manifold arrangements, static electricity precautions, ship to ship operations, cargo hoses. The International Safety Guide for Oil Tankers and Terminals (ISGOTT) contains guidance pertaining to the safe carriage and handling of petroleum products. In this respect Inspectors should observe cargo operations, interview responsible personnel, review the operator's operating procedures and observe the degree of compliance by officers and crew to appropriate regulations and guidelines. Common causes of incidents are poor planning, improper supervision of transfer operations, inadequate knowledge or disregard of the dangers of static electricity, insufficient personnel on duty and insufficient or incorrect information concerning cargo properties.

Chapter 9: Mooring

This chapter aims to accumulate information on all aspects of mooring equipment and operations. Furthermore, it contains questions regarding to the mooring equipment documentation, also it examines if the mooring equipment do comply with OCIMF

guidelines. Additionally, there are questions regarding to the anchoring equipment, single points mooring, and emergency towing arrangements.

Chapter 10: Communication

This section is related the communication procedures that the vessel follows, the extent to which the crew is familiar and aware of the function of the ship communications systems and it is checked if the communication equipment is in good order. It is a particularly important chapter given that through communication systems it's ensured the company is aware of the specific position of the ship. Furthermore, in case of the ship is under threat or it has been compromised, through Ship Security Alert System shall, when activated, initiate and transmit an alert via SSAS.

Chapter 11: Engine and Steering Compartments

This section contains questions from which it is aimed the acquisition of responses related to the procedures followed for the engine and steering compartments. More specifically, it is compromised with a series of questions for policies, procedures, instructions and documentation that the operators promote and follow. Also, through this chapter it is examined that the PMS, which is followed is up to date, accurate, effective and maintained in accordance with the requirements of the ISM Code. Additionally, there are references about the safety management, machinery status. In the broadest sense through these questions, it is pursued the verification of the familiarity of the crew with the operation of the engine and steering compartments handling.

Chapter 12: General Appearance and Condition

Through the series of questions, of this chapter, remarks should be recorded in additional comments relating to the superficial condition of the coating and appearance of the hull, weather decks, and superstructure and on the condition and cleanliness of the accommodation and living quarters including hygiene and sanitation. Also, there are references for electrical equipment, internal spaces and accommodation areas.

Chapter 13: Ice Operations

This particular section is to be completed if the vessel has an Ice Class Notation or has a valid winterisation certificate. The OCIMF publication 'The Use of Large Tankers in Seasonal First Year Ice and Severe Sub-Zero conditions' provides guidance on the safe operation of tankers in areas affected by seasonal first year ice The IMO Guidelines for Ships Operating In polar Waters sets out recommendations that address ship structure, lifesaving and fire-fighting equipment, operational issues and environmental considerations. These voluntary guidelines are intended for ships constructed after 1 Jan 2011, particularly existing ships are encourages

to comply with the Code as far as reasonable and practical. The OCIMF Briefing Paper for chartering and Vetting Groups titled “The Use of Large Tankers in Seasonal First-Year Ice or Severe Sub-Zero Conditions” contains comprehensive guidance relating to the use of tankers >50,000dwt with no, or low ice class that are likely to encounter first-year ice. Particularly, this group of questions is dealing with the verification that the procedures for operating in ice are available and the systems are in place to enable the regular receipt of up-to- date information (VIQ 6, OCIMF 2014).

Chapter 4: TMSA

4.1 Introduction

As mentioned within the previous sections, the TMSA has to be seen in connection with the before described tanker vetting. It was developed to include also the tanker operator into the vetting process. Turker stated that the need for a scheme focusing on the tanker operators was necessary due to the criticism which was given that the requirements of the ISM code were not being followed properly. Within the above quotation the direct link between the TMSA and the ISM Code and its SMS respectively can be seen. In addition to this internal use for performance improvement of a ship operator, it has to be said that the TMSA, since its introduction, is playing a major role in the vetting process. Because this scheme gives, as mentioned above, the oil majors the first tool to assess the operator's shore operation and has been playing a major role in the vetting process since its introduction. This does not mean that this had not been considered by the oil majors in the pre TMSA era. In fact, a ship operator's management capability and performance is playing an important role in the vetting regimes since its appearance, but the TMSA allows the charterer to judge a ship operator's self assessment and thus the awareness of an tanker operator against his actual performance, as validated by the vessel's inspections rather than to base an operator's assessment only on the overall performance of his fleet (Turker & Er, 2008).

The development in the shipping industry which led to performance measurement and performance management and consequently to the TMSA started with the fundamental change to focus more on quality aspects within the operations of ships. This shall not mean that quality shipping has not existed before, however, the industry started using international quality standards and became later also subject of a mandatory quality assurance scheme. The latter is the underlying requirement for performance measurement in general and thus the underlying reason why it is necessary to establish a uniform measurement approach. The Tanker Management Self Assessment (TMSA) programme offers a standard framework for assessment of a vessel operator's management systems. The programme provides operations with guidelines that contain the elements of a formal management system, essential for the management and operation of their vessels. In order to be effective, a management system needs to be much more than a narration of procedures. The company – leadership management should determine the company's values and aspirations and detail how the company intends to achieve the objectives of their stated policies.

Additionally, management must also provide adequate resources to ensure that the vessels are properly managed, crewed, operated and maintained by well-trained, competent – personnel.

In an effective system, incidents and near misses are investigated and analysed so as to determine root causes and corrective actions to be implemented to prevent possible reoccurrence. It is recommended that hazards and risks are systematically identified and assessed to ensure that risk exposure is effectively managed and considered at appropriate levels of management. There is a system to manage change and quantifiable indicators are used to measure the system's effectiveness and facilitate continuous improvement. TMSA contains these elements and provides a structure to assist operators assess and modify their management systems to improve overall performance and provides the industry with useful information presented in a uniform format. Generally speaking, TMSA programme industry complements industry quality codes and is intended to encourage self-regulation and promote continuous improvement. It is also designed so as to provide to shipping companies and vessel operators with a means by which they can demonstrate a strong commitment to safety and environmental excellence.

4.2 What is TMSA

OCIMF's Tanker Management Self Assessment programme was introduced in 2004 as a tool to help shipping companies and vessel operators to make an appraisal and assess, measure and improve their procedures and management safety systems. It supplements industry quality codes and is intended to encourage self-regulation and evaluation, so as to promote continuous improvement among tanker operators. While International conventions like SOLAS (Safety of Life at Sea) and International Safety Management (ISM) code are in place to enhance the safety of merchant shipping and achieve incident – free and high quality operations, effective implementation of these regulations is dependent upon the ship operator establishing an effective safety management system. The TMSA programme can assist all vessel operators to improve their safety management systems.

Furthermore, this programme encourages vessel operators to assess their own safety management system against listed key performance indicators and provides best practice guidance on how to acquire appropriate standards of safety performance. Vessel operators are encouraged to use their assessment results to develop phased improvement plans that can be applied as appropriate across their entire fleet and to share TMSA's with potential charterers via the TMSA database. As a tool for driving up safety standards, the TMSA has rapidly

gained international credibility and acceptance and today, some 90% of operators use the programme, including all the oil major (TMSA 2, INTERTANKO, 2008).

4.3 Purpose and Scope

The Oil Companies Marine Forum (OCIMF) has been in the forefront of the drive to implement a common vessel inspection process characterized by uniformity through the introduction of the Ship Inspection Report Exchange (SIRE) system. This system promotes a uniformly high standard of common inspections. In this terms, member companies can then use then utilize the results amongst their own vetting systems. The management and operation of vessels within a culture o safety and environmental excellence was created with the introduction of the ISM code. The above mentioned code requires vessel operators to implement a safety management system that will assist to achieve incident free operations. However, there is a clear difference between the standards of those vessel operators that support the idea of ISM code and those that aim to meet only its minimum requirements. This distinction may result in a character due-diligence concerns having to assess the operational standards of individual vessel operators.

The programme encourages vessel operators to assess their safety management systems against listed key performance indicators and provides best practice guidance. Best practice is an effective way to eliminate the possibility of problems reoccurring by creating opportunities and optimizing performance in crucial areas such as safety and environmental excellence. Companies should focus on transferring the best practices across their fleet through the consistent application of improved processes and procedures. It is recognized that non-SOLAS vessels operate outside the ISM code, however, operators of such vessels may use this guide as a tool to measure and improve their operations. A shipping company that incorporates the guidelines contained in the TMSA into their management system may be considered as having an active assessment process, even if not being inspected under the SIRE scheme or having ISM as a management system. Additionally, vessel operators can use their assessment results to develop a phased improvement plan that improves safety and environmental performance. Although, TMSA programme provides guidance, responsibility for vessel operations, and distribution of this data, lies exclusively with the vessel operator. Most of the oil companies operate due diligence in selecting well-maintained and will-managed vessels for charter. The TMSA builds upon the ISM code and can provide valuable feedback to the charter on the effectiveness of the vessel operator's management system. It is

about a common approach to gathering information and data will eliminate duplication of effort by operators.

This TMSA initiative encourages vessel operators to achieve high standards of vessel management and continuous improvement, and provides guidance on what OCIMF considers to be current industry best practice (TMSA 2, INTERTANKO, 2008).

4.4 Benefits of TMSA

The benefits of the TMSA to vessel operators are clear, initially helps them to drive up the standards of safety management systems and consequently by leading to fewer incident and encourages a continuous improvement approach to safety management. Furthermore, it inserts a preventative approach to maintenance, reducing unplanned stoppages and delays for repairs (off-hire), so it is needless to say that it conducts to the maximization of company's profits and income. So, the above mentioned reduced the risk of incidents and delays/breakdowns feeds back over time into higher performance in terms of safety and environmental protection and enhances the reputation and overall appearance of the company. In general terms, companies that incorporate the TMSA guidelines into their management systems are considered to have an active assessment process, even if not being inspected under SIRE or having adopted ISM. Another, positive effect of TMSA is the reduction of the risk of incidents feeds back over time into lower insurance costs and higher earnings. The above mentioned process of TMSA, is not imposed upon vessel operators from outside, it is owned and managed by the operators themselves and the resulting data remains fully under their control and it is customized according the specific needs of each operator (<https://www.ocimf.org/>).

4.5 Continuous improvement

Leadership at all levels is an essential part of any improvement process, the building blocks of effective leadership are clarity in describing desired targets and strategic vision, direction for staff and continuous improvement in individual and collective results. The continuous-improvement cycle aims to deliver improvements through a company's management system.

The KPIs (Key performance Indicators) within the elements help operators to drive their continuous-improvement programmes. In this way operators can utilize the performance information gained from their own assessment stand-alone lever for improvement or combine it with the tools they currently use for developing and improving their management systems.

In either case, the feedback should provide operators with a clear, objective picture of their performance. This will help them to spot and identify gaps and will provide a focus for planning closure and future improvements (INTERTANKO, 2008).

The key components of the continuous-improvement cycle

Below it is presented a summary of the key stage of the continuous-improvement cycle, namely, plan, act, measure and improve.

1. Plan

Development of plans that include effective strategies and provide clarity in company policies, purpose, processes, roles and responsibilities. Specifically, effective strategies require clear policies, purposes, processes, roles and responsibilities. OCIMF provides guidance on these issues by encouraging companies to conduct their business with a focus on safety and environmental excellence. The TMSA guidelines give to vessel operators a clear indication of related processes and targets that will help them in their planning this goal.

2. Act

It is proposed for the companies to operate so as to achieve the organization's objectives by consistent implementation of plan. The company should communicate plans and then prioritizes and targets processes for improvement, providing clear definition of objectives and outcome measurements. The TMSA guidelines are designed to help operators apply continuous-improvements tools and techniques, this segment of continuous-improvement cycle helps staff to align their actions with company goals and to improve performance.

3. Measure

In general terms, there should be constant checking, evaluation, and feed back of the information regarding to the results gained. Considering, safety and environmental excellence which requires processes to check, evaluate and feed back information on progress and achievements in order to achieve sustainable improvement. Through, this segment of the continuous-improvement cycle indicates procedural compliance, as well as implementation and improvement efforts.

4. Improve

The shipping companies should define their targets and focus on efforts regarding areas where maximum benefit and improvement can be obtained. The operator compares identified processes with its technical and operational needs and resources so that it can develop a prioritized plan. Furthermore, staff should revise the plan and agree it with management. In case that any action is required but resources are unavailable, the issue should be referred to

senior managers. It is of the utmost importance to emphasize on achieving long-term improvements rather than quick fixes. This above mentioned segment of the continuous improvement cycle aligns actions with process targets and ensures that individual improvement plans are regularly reviewed and updated. On the whole targets are defined and efforts focused on areas where the vessel operator can accumulate the greatest benefits and improvements.

TMSA Guidelines

The TMSA guidelines define 13 principles of management practice. They provide a framework for vessel operators who are aiming to achieve safety and environmental excellence and are structured as follows:

- The title indicates the fundamental area of management practice
- The main objective defines the goal to be achieved
- The supporting paragraphs within elements deploying

4.6 Measuring company's management system status

As far as vessel operators' measurements it is advised that operators may already have a comprehensive measurement system within their management systems and they may find that they already use some of the KPIs contained in the elements. Where the KPIs are unfamiliar, they can build suitable monitoring processes into their existing management systems.

4.6.1 The measurement processes

In the context of the TMSA, KPIs are measures against which a company can track its effectiveness in meeting its aims and objectives. Companies can use the information contained in this document to assess their management systems and to demonstrate an attainment level, ranked in levels from 1 to 4, for each of the 13 elements. KPIs within each sub-element are a tool, which can be proved especially useful to operators for assessing the level of attainment their company has reached. The activities within each element are grouped into four stages. In general terms, the higher stages build on the lower stages but this is not always the case. The vessel operator may already have addressed some of the higher stage activities without having all the underlying stages in place and should report accordingly. Furthermore, the operator may also choose to address activities in a different order than the stages would suggest. However, it should be noted that the most benefit is achieved when the stages are completed in order. Furthermore, if the lower stages have not been effectively addressed, assumptions made in completing higher stages may be ambiguous. Special attention should be given therefore on completing elements generally in the order presented.

Given that the TMSA is designed to be used worldwide for companies who manage tankers and barges (international, coastal, and inland). Not every KPI will be applicable in all cases and this will depend on company's size or structure, specific trade and local regulations, customs and conditions. With the expansion of the scope of the TMSA to encompass coastal and inland vessels, it is stressed out that some of the higher stages may not be immediately attainable due to company size or structure. Additionally, there are some KPI's, which are included specifically for internationally trading vessels and may not, therefore, be applicable in certain trades. There are other KPI's that, in some trades, due to local regulations, customs or conditions, are addressed by agencies beyond operator's or company's control. In order to address this concern, these KPIs have been specifically identified and operators, as specified in Part Two, will have a 'Not Applicable' (N/A) option when responding to the KPI, in addition to the standard 'Yes' and 'No' responses. Where a company determines, after careful consideration, that a KPI is not applicable to them, the reason for that determination must be stated and justified. There is no expectation that all stages will be addressed immediately, but the degree of completion will be a factor in the quality assessment. As a continuous improvement is also being measured, it is preferable to enter a TMSA showing current status and record improvements with later updates, rather than wait to submit a more complete assessment later.

The TMSA should be a true self-assessment, users will learn most and derive the most benefit when the TMSA is completed by personnel directly involved in the activity. As each stage is completed, documentary evidence should be prepared and made available to senior management. This indicates that processes and procedures are in place within the safety management system. It is also beneficial to reference this evidence when submitting the TMSA to OCIMF. The level of attainment achieved must be as accurate and substantive as possible. Specifically, OCIMF members companies review TMSA submissions and, where appropriate, visit operators' offices to verify the accuracy of the submission, by reviewing the KPI's and other documentary evidence. Over-stating the status of a company's management system detracts from the intent of the programme and could result in incorrect or meaningless information being introduced, thereby distorting improvement efforts.

Once an initial TMSA has been submitted, a gap analysis should be undertaken in order to identify which elements and stages have yet to be attained. From this analysis, elements should be selected that best fit an individual operator's business and which will best support the attainment of the company's objectives. (TMSA 2, INTERTANKO, 2008)

Finally, as each level is completed, documentary evidence should be prepared or referenced to support the assessment and facilitate any external verification. Once an initial TMSA has been recorded the company may conduct a review to identify which elements and levels have yet to be attained, enabling a performance improvement programme to be developed. Companies should decide which elements and levels will improve the performance of their fleet operation and appropriate to focus on. In general terms, companies are advised to review and update assessments in the TMSA online tool on an annual basis. Additional updates are recommended whenever they have made improvements/changes to their SMS or believe they have attained a higher level in any element rather than wait for planned improvements to be actioned. It is advised that significant changes in management structure, SMS or changes to fleet size and composition may also prompt a review (TMSA3, 2017).

In this section it will be presented an overview of each element that comprises TMSA 3.

4.7 TMSA 3

In February 2017 TMSA was integrated and embedded into a new integrated SIRE/TMSA programme, this allows new TMSA functionality and will provide an improved user experience. In April 2017, the third edition of TMSA (TMSA3) went live on 10 April 2017. Companies and vessel technical operators can transfer their TMSA2 report into SIRE prior to this date and continue to amend and publish their TMSA2 reports until 31 December 2017, after 31 December 2017, only TMSA3 reports can be created or amended. Below are mentioned the key changes that have resulted from the incorporation of TMSA into SIRE and the launch of TMSA edition 3. Further, instructions have been provided for vessel technical operators to support their transfer from TMSA2 to TMSA3 with information so they get the most of their new TMSA account.

The main aims in revising TMSA are to maintain its relevance but to be up-to-date and reflect changes in legislation and best practice since TMSA2 was published July 2008. Furthermore to provide clarity and to encourage a more unified interpretation of the KPIs and best practice guidance and in this way to promote continuous improvement, which constitutes an integral requirement of TMSA (OCIMF, TMSA3 FAQs).

4.7.1 TMSA SIRE Integration

The TMSA programme and report is now fully integrated within OCIMF's Ship Inspection Report Programme (SIRE), providing a single area to maintain all data related to a vessel's technical operator, including; Ship Inspections, Vessel Particulars Questionnaire (VPQ), Crew Reports and Incidents. The aforementioned integration takes advantage of the latest

technology and security practices resulting in an improved user experience. As far as the Closure of old TMSA programme, is concerned, from 1 February 2017, the previous standalone TMSA programme can no longer be used to manage TMSA documents. Thus, all members are now able to transfer their TMSA accounts to the new SIRE/TMSA programme, which provides an improved, single area to maintain all data related to a vessel's technical operator. The Oil Companies International Marine Forum (OCIMF) has launched the third edition of its Tanker Management and Self Assessment (TMSA) programme and book. Widely used since 2004, the latest edition adopts the same familiar document structure as previous TMSA editions, but has been updated to provide clarity of wording, improve consistency of language, make conducting the self assessment easier and to promote continuous improvement.

New in this third edition there are the below key changes:

- Expanded best practice guidance to complement the KPIs.
- Revised best practice guidance to remove ambiguity and duplication.
- Streamlined and merged elements to improve consistency and make conducting the self-assessment easier.
- Removed the option to mark KPIs as not applicable.
- Introduced updated industry legislative requirements, including the Manila Amendments to the Maritime Labour Convention 2006, the Polar Code and the Ballast Water Management Convention.
- Revised Element 6 and 6A - Cargo, Ballast, Tank Cleaning, Bunkering, Mooring and Anchoring Operations, with additional KPIs and best practice guidance.
- Revised Element 10 – Environmental and Energy Management (previously Environmental Management) incorporating the OCIMF Energy Efficiency and Fuel Management paper that was a supplement to TMSA2.
- Added a new element: Element 13 – Maritime Security (OCIMF, TMSA3 Fast Facts).

4.7.2 TMSA Elements

Element 1 and 1A: Leadership and the Safety Management System

In this element it is promoted that through visible and effective leadership, management promotes HSSE excellence at all levels in the company. Its main objective is to provide direction and clearly define responsibilities and accountabilities at all levels within the company. Furthermore it promotes, developing and maintaining an effective SMS requires commitment at the highest levels of the organization and clear definitions of the roles and

responsibilities for everyone involved in its administration. Its main roles and responsibilities are the assurance that management roles and individual responsibilities are clearly established, assigned, understood and documented. Additionally, there are references regarding to communication, the company establishes and maintains effective communication procedures between shore-based management and the fleet, this includes communication of the SMS to all areas of the company. By adopting, the HSSE excellence the company ensures that the importance of HSSE is understood at all levels of the organisation and is actively promoted through leadership and the disciplined use of a documented SMS. The company establishes and maintains a documented SMS that can accomplish the stated fleet management policies and objectives, it is important that all managers are held accountable for achieving the targets and objectives set for them. It is of the outmost importance that management activities that require procedures and instructions are systematically identified, where instructions and procedures are required, they are suited to the purpose and easy to understand and follow. It is advised that where appropriate, these instructions are developed in consultation with those who will be affected by them or who have to apply them. By establishing the measurement through KPIs, the company targets to continual improvement and in this way the company establishes KPIs to measure the effectiveness of the SMS in meeting the organisational goals and regulatory responsibilities. The company uses the KPIs to identify areas that need attention to ensure continual improvement in the performance of their SMS. All follow-up plans include the clear assignment of responsibility for any improvement action, for the aforementioned goal. The company's senior management review the effectiveness of the SMS at periodic management reviews to verify the adequacy of the system or to improve its effectiveness. The review system includes provision for recording and maintaining the results of each management review.

Element 2: Recruitment and Management of Shore-based Personnel

Its main objective is to ensure that the fleet is supported by sufficient, competent and motivated shore-based personnel who are committed to the effective development and implementation of the SMS. As far as its main aim is to ensure that suitably qualified, competent and motivated shore-based personnel are recruited, trained and retained to meet current and future needs of the company. When referring to key shore-based personnel, including contracted personnel, are those who are directly involved in the management of the vessel and personnel. They may include the DPA, CSO, superintendents, technical managers, human resource managers and HSSE managers.

Regarding the Shore-based personnel recruitment and training, companies establish and maintain procedures for the selection, recruitment and training of shore-based personnel.

These procedures are mainly to:

- Verify that medical fitness requirements are established and met by personnel at the time of their appointment and on an ongoing basis thereafter.
- Define competency requirements in relation to technical education, training, skills and experience for key roles.
- Verify that personnel employed are competent to carry out their duties.
- Identify follow-up training requirements and retain records of attendance at courses, seminars and conferences.
- Include an appraisal system and set criteria for promotion.
- Ensure that records of all personnel qualifications, experience and training are consistently maintained.
- Promote personnel continuity, with an emphasis on retaining and developing people in key roles (a suggested calculation method for retention of personnel is in the glossary).
- Ensure sufficient personnel are employed to provide effective oversight of vessels in the fleet.
- Address succession planning.

Element 3 and 3A: Recruitment, Management and Wellbeing of Vessel Personnel

The main objectives of element 3 and 3A are to assure that all vessels in the fleet have qualified, competent and motivated personnel who fully understand their roles and responsibilities and who are capable of working effectively as a team. The main goal of element 3 is to ensure that suitably qualified, competent and motivated vessel personnel are recruited, trained and retained to deliver safe and reliable operations onboard company vessels.

As far as vessel personnel recruitment, training and wellbeing, is concerned, companies establish and maintain procedures for the recruitment, training and wellbeing of vessel personnel.

These procedures:

- Verify that certificates of competency are authentic and valid.
- Where appropriate, take additional steps to determine the competency of vessel personnel and the accuracy of their pre-employment records.
- Verify that medical requirements are met by personnel at the time of their appointment and on an ongoing basis thereafter.

- Take steps to verify the accuracy of pre-employment records and initial and continued competence.
- Ensure that mandatory, company specific and individual training requirements are identified and that records of personnel attending courses, seminars and conferences are kept.
- Confirm that the working hours of all personnel are accurately recorded and that management monitors the records in order to ensure adequate rest periods.
- Promote and monitor the retention of vessel personnel within the company (a suggested calculation method for retention of personnel is in the glossary).
- Provide adequate resources to administer the conditions of employment for personnel, including personal needs, wellbeing and requirements.
- Determine and clearly state the working language to be used onboard vessels and ensure that all vessel personnel can communicate in this language.
- Promote cultural awareness and teamwork.

For the purposes of TMSA, where responsibilities have been delegated to manning agents or third party contractors their functions are assessed as though they were performed by the company.

Element 4 and 4A: Vessel Reliability and Maintenance including Critical Equipment

The main target of element 4 and 4A is to establish maintenance and repair procedures, so that all vessels in the fleet operate safely, efficiently and reliably, and develop additional control measures for identified critical equipment. Regarding to reliability and maintenance matters, maintenance may include periodic inspection, measurement, performance monitoring or physical overhaul, including timely changing of perishable or consumable parts. Maintenance may be planned in advance or unplanned e.g. due to an abnormal condition or breakdown, specifically equipment reliability depends on factors such as design, construction, initial commissioning, operating practices and maintenance. Furthermore, for installed equipment, a planned and executed maintenance strategy is essential if vessels are to operate reliably and avoid unnecessary downtime or costly incidents. Regarding, the critical equipment and systems to mitigate the risk of a vessel incident causing harm to personnel, the environment or assets, procedures are established to identify critical equipment and systems which, in the event of sudden failure, may result in a hazardous situation. Concerning the maintenance procedures, companies develop procedures and systems to manage onboard maintenance. These procedures:

- Ensure that the structural integrity of all vessels in the fleet is maintained through an appropriate monitoring programme.

- Ensure that all relevant vessel certification remains valid.
- Define the maintenance philosophy required to ensure the safe operation of onboard equipment.
- Provide timely support and ensure the availability of fit for purpose spare parts and materials and other resources necessary to carry out maintenance, giving particular consideration to the origin of spare parts.
- Ensure that maintenance records and reports are consistently available, both onboard and in the shore-based management office.
- Establish procedures for monitoring Class documentation, which provides an overview of the status of specific onboard equipment.
- Establish a requirement for superintendents to conduct routine vessel inspections and confirm that planned maintenance has taken place.
- Has a system in place to monitor overdue maintenance.
- Provide a defect-reporting and close-out system that can be monitored both onboard and ashore.

The system specifies a formal process for notifying shore management when critical equipment is taken out of service and includes methods for recording management's approval of any mitigating steps introduced while the equipment is out of service.

Element 5: Navigational Safety

The main target of element which is related to navigational safety is to ensure that company vessels are navigated safely at all times. Navigational safety's high standards of navigation are fundamental for the safety of vessels, personnel and cargoes and the protection of the environment.

While the Master is ultimately responsible for the vessel's safe navigation, shore-based management ensure that:

- The SMS includes comprehensive navigational procedures that cover all stages of a vessel's voyages from berth-to-berth including:
 - o Bridge manning levels.
 - o Calling the Master.
 - o Handovers.
 - o Navigation with Pilot aboard.
 - o Navigating in heavy weather/restricted visibility/ice.
 - o Management of lengthy periods with increased bridge manning.
 - o Hazardous navigational transits.

- o Use of the BNWAS.
- o Use of electronic navigational aids.
- o Under keel clearance.
- Appropriate shore-based personnel are identified as having responsibility for navigational standards.
- The bridge team is appropriately trained, including:
 - o Team dynamics.
 - o Bridge resource management.
 - o Ship-handling.
 - o Type specific navigational equipment.
- Bridge equipment is maintained operable at all times.
- Charts and publications, including electronic licenses, are maintained up-to-date and are available as required.
- Compliance with navigational procedures is assured via a comprehensive navigation assessment and audit programme and subsequent analysis.

Element 6 and 6A: Cargo, Ballast, Tank Cleaning, Bunkering, Mooring and Anchoring Operations

Its main function is to establish planning and operational procedures to ensure that cargo, ballast, tank cleaning, bunkering, mooring and anchoring operations are conducted in a safe and efficient manner. It is of the greatest importance the maintenance of high standards of planning and execution for these operations is fundamental to the safety of vessels, personnel and for the protection of the environment.

While the Master is ultimately responsible for these operations, shore-based management ensures that:

For Cargo, Ballast, Tank Cleaning and Bunkering

- Procedures cover both generic and cargo specific requirements (e.g. oil/chemical/ LPG / LNG) for all fleet vessel types.
- Pre-operational tests and checks are conducted.
- Cargo specific hazards are identified and addressed.
- All cargo, ballast tank cleaning and bunkering operations are thoroughly planned and safely executed.
- Operations are properly recorded and documented.
- Vessel personnel receive cargo specific familiarisation, training and mentoring.

- Compliance with procedures is assured by a verification and audit plan.

For Mooring and Anchoring Operations

- Procedures cover the full range of mooring and anchoring activities that the company's fleet may be involved in, including specific operations such as single buoy mooring/STS transfers.
- Mooring and anchoring equipment including fittings and mooring lines are effectively inspected, maintained, tested and documented.
- Operations are thoroughly planned and safely executed, especially mooring at terminals that have not been previously visited.
- Vessel personnel receive familiarisation, training and mentoring.
- Compliance with procedures is assured by a verification and audit plan.

Element 7: Management of Change

Element's 7 main aims to ensure that all consequences and associated risks are identified and mitigated prior to implementing change. The company should establish a formal, systematic process to evaluate, approve, communicate and document both temporary and permanent changes that could impact their operations. Management of change is related Changes to equipment, suppliers, personnel (including third party contractors) operating conditions or procedures, or changes to the size or composition of the fleet or company organisation can significantly increase the risk of an incident. The scope of the management of change process can range from minor change, such as a software upgrade, to a major organisational change. In any circumstance management of change procedures ensure that:

- Permanent or temporary changes, both onboard and ashore, are subject to the management of change process and fully documented.
- The impact of any change is risk assessed and mitigation measures identified.
- Personnel affected by change are identified and the reasons for change are understood by all.
- The required level of authority for the approval of changes is defined.
- Changes comply with regulation, industry standards and original equipment design specifications.
- Training requirements resulting from change are identified and documented.
- Relevant documentation is amended following change(s), e.g. plans, manuals and drawings.
- There is an appropriate procedure for personnel handover and familiarisation, both ashore and onboard vessels, including third party contractors.
- Changes not carried out within the proposed timescale are reviewed and revalidated before they are completed.

- Results of completed changes are reviewed to confirm that objectives have been met.

Element 8: Incident Reporting, Investigation and Analysis

The main objective of this element is that the company should establish procedures to ensure effective reporting, investigation and analysis of incidents and near misses to prevent recurrence. One of the fundamental principles of safety management is that all incidents are preventable. Therefore, it is important to ensure that where an incident or accident occurs, the subsequent investigation is thorough, the root causes are identified and that measures are implemented to prevent a recurrence and communicated effectively to shore-based and vessel personnel.

The procedures of Incident Reporting, Investigation and Analysis are:

- Provide for the timely reporting and investigation of an incident or near miss.
- Identify the personnel responsible for reporting an incident, authorising and conducting the investigation and initiating subsequent corrective actions.
- Include guidance on the classification of all incidents.
- Provide incident investigation training to personnel with this responsibility.
- Ensure that the root causes and factors contributing to an incident are identified and that steps are taken to prevent recurrence.
- Include provision for determining the actions needed to reduce the risk of related incidents.
- Ensure that incident and accident investigation findings are retained and analysed to determine where improvements to the SMS, standards, procedures or practices are required.
- Specify methods for determining whether liaison is needed with industry groups (such as Classification Societies or equipment manufacturers) to avoid similar incidents on other vessels.
- Ensure that lessons learnt from an incident or near miss investigation are shared across the fleet.

Element 9 and 9A: Safety Management

Its main aim is to develop a proactive safety culture both on board and ashore, that includes identification of hazards and the implementation of preventive and mitigation measures to work towards incident free operation. Furthermore, it focuses on the establishment of an active fleet wide safety culture through the awareness and involvement of personnel and through effective risk assessment and permit to work programs. Additionally, it aims in establishing an active safety culture onboard through the introduction of structured work planning, hazard identification and reporting programs. With regards to shore-based and fleet monitoring, effective safety management requires the systematic identification of hazards and

measures to eliminate or reduce risks to the lowest practicable level. It also requires measures to promote an effective safety culture and motivate company personnel to ensure that they understand and embrace the requirements of the SMS.

The company establishes procedures to ensure that:

- There is a risk assessment programme that is designed to identify potential hazards and exposures, and manage operational risks, relating to HSSE.
- Risk assessments and their application across the fleet are periodically reviewed and updated.
- Vessel personnel are familiar with hazard identification including human factors.
- Programmes such as behavior-based safety systems, toolbox talks, stop work authority are implemented.
- A designated Safety Officer conducts safety inspections onboard at scheduled intervals and records the results of these inspections which are reviewed at monthly safety meetings.
- Shore-based personnel conduct regular onboard inspections to evaluate the standards of safety being maintained within the fleet and make recommendations to senior management based on the findings.
- An effective permit to work system is implemented.
- The safety of third party contractors is effectively managed.
- Training and mentoring is conducted onboard by appropriately qualified shore-based personnel.
- An active safety culture is encouraged throughout the company and periodically evaluated.
- Positive reinforcement is used to encourage safe behaviours.

Element 10: Environmental and Energy Management

The main target of environmental and energy management, companies establish a proactive approach to environmental and energy management that includes the identification of sources of marine and atmospheric emissions and implementation of measures to avoid or reduce potential impacts. In this element are included procedures to optimize energy efficiency and reduce emissions and which sets targets for continual improvement in environmental performance. Shipping companies should establish and maintain procedures to reduce as far as practically possible the impact of their operations on the environment. These include provisions for:

- Development of environmental protection policy and plans.
- The systematic identification and assessment of sources of marine and atmospheric emissions.

- Continual improvement in avoiding or minimising potential adverse environmental impacts and waste generation including setting of targets and ensuring the safe and responsible disposal of residual wastes.
- Effective fuel management.
- Optimizing energy efficiency.
- Environmentally sound ship recycling.
- Establishing requirements for ballast water exchange.
- Identifying and implementing energy saving opportunities.
- Effective use of current and emerging technology for existing vessels and new builds.
- Internal and external benchmarking of environmental performance.

Element 11: Emergency Preparedness and Contingency Planning

The main target of its element is to establish an emergency response system and regularly test it to ensure an ongoing ability to effectively respond to and manage incidents.

The Emergency Response System (Incident Response System) and contingency arrangements include:

- Company and vessel emergency response plans.
- Roles and responsibilities of personnel.
- Designated facilities and provision of associated equipment.
- Drill plans including the scope and frequency.
- Record keeping requirements.
- Review of drills and implementation of lessons learned.
- Media training for appropriate shore-based and vessel personnel.
- Business continuity plans including recovery measures.
- Use of external resources including specialist contractors e.g. media consultants, emergency response services and legal services.
- Additional resources, e.g. trained negotiators, family liaison, trauma support.

Element 12 and 12A: Measurement, Analysis and Improvement

In this element it is aimed to establish effective inspection and audit programmes that measure compliance with the SMS and monitor the condition of vessels and through analysis of the result drives continual improvement. In order to be fully effective, the SMS is maintained as a living document at the core of the business.

By conducting vessel inspections, the company ensures that:

- Shore-based personnel carry out frequent inspections to monitor vessel condition.

- The results of the inspections including any action items are compiled in a written report to company management.

- Action items are tracked to closure.

- Periodic analysis of the inspections is used to drive continual improvement.

Furthermore by conducting an Internal audit, the company ensures that:

- Internal audits of all vessels and relevant office locations are conducted to verify all personnel are in compliance with the SMS and applicable regulation.

- Results of audits, including any non-conformances are reported promptly to company management.

- Non-conformances are tracked to closure.

- Periodic analysis of the audit is used to drive continual improvement.

Analysis of the results of inspections and audits form part of periodic management reviews of the SMS.

Element 13: Maritime Security

Through the implementation of this element it is aimed to provide a safe and secure working environment by developing a proactive approach to security management. To mitigate security risks and minimise the consequences of any breaches of security affecting, or potentially affecting, personnel and assets at all company locations. Additionally, effective security management requires the systematic identification of threats in all areas of the company's business, with measures implemented to mitigate risks to the lowest practicable level. Due to the continually changing maritime security situation, the company has a system for monitoring and managing change, complemented by a tiered approach to security.

The company ensures that:

- Security plans cover all aspects of their activities.

- Procedures are in place to identify threats covering all business activities.

- Measures to mitigate and respond to identified threats are in place.

- Security information is managed and reviewed.

- Procedures are in place for the reporting of actual incidents and potential threats.

- Risk assessments of activities are undertaken to identify and mitigate potential security threats.

- Personnel receive appropriate security training applicable to their responsibilities.

- Procedures include identification of threats to cyber security, with appropriate guidance and mitigating measures in place and the active promotion of awareness.

- The travel policy includes provision for minimising security threats to personnel.

- Security procedures are regularly updated taking into account latest industry guidance.
- Security management is included in the internal audit programme.
- Assessments and exercises are undertaken to test preparedness.
- Independent specialist support is provided, as appropriate, to respond to identified threats.
- Vessels are provided with enhanced security and monitoring equipment.
- Security enhancements are considered for inclusion in refit specifications and new build designs.
- Innovative security technology is tested and implemented as appropriate.

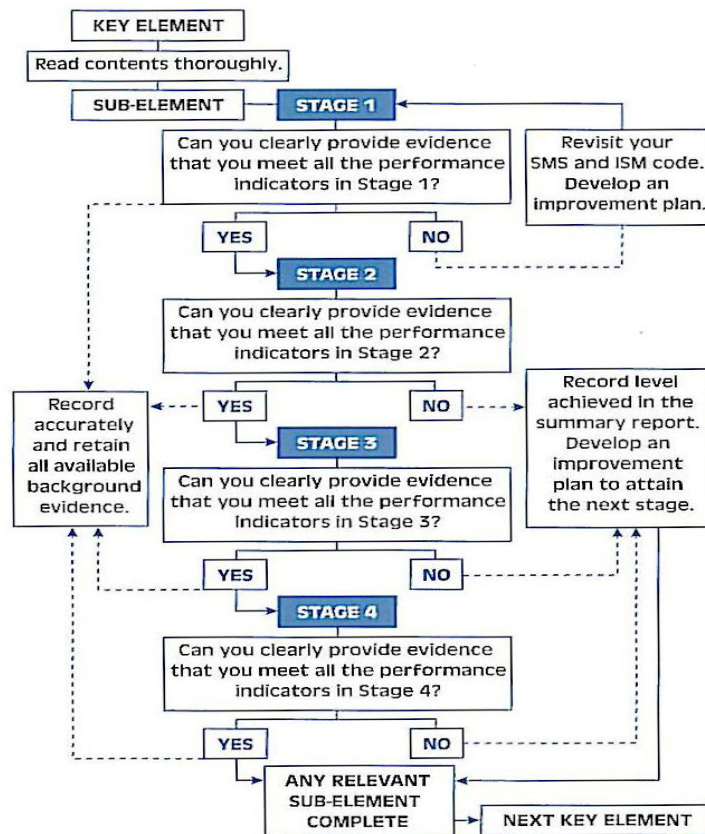
These aforementioned elements are subdivided into four different stages, whereas the first two stages are according very similar to the applicable ISM Code measures of a tanker operator who has implemented the ISM Code in its true spirit and not only proforma. The last two stages would require a "restructuring and/or remodelling of the Safety Management System" of the operator. (Turker & Er 2008)

Furthermore, it can be said that oil majors are also using these stages for the assessment of how deep the degree of cooperation can be committed between a charter and a owner, even though this is not officially confessed. According to industry sources, some oil majors are defining these cooperation stages, none officially, as listed below:

- TMSA Stage 1 → The tanker operator is suitable for V/C.
- TMSA Stage 2 → The tanker operator is suitable for CoA
- TMSA Stage 3 → The tanker operator is suitable for T/C
- TMSA Stage 4 → The tanker operator is suitable for a joint venture with the oil major.

Within the given flowchart, it can be seen how the process within a TMSA self-assessment should be conducted. It can also be seen that a failure to fulfil stage 1 would have to lead to a revision of the SMS and the ISM Code incorporation within the company.

Figure 4.1: Process within a TMSA self-assessment



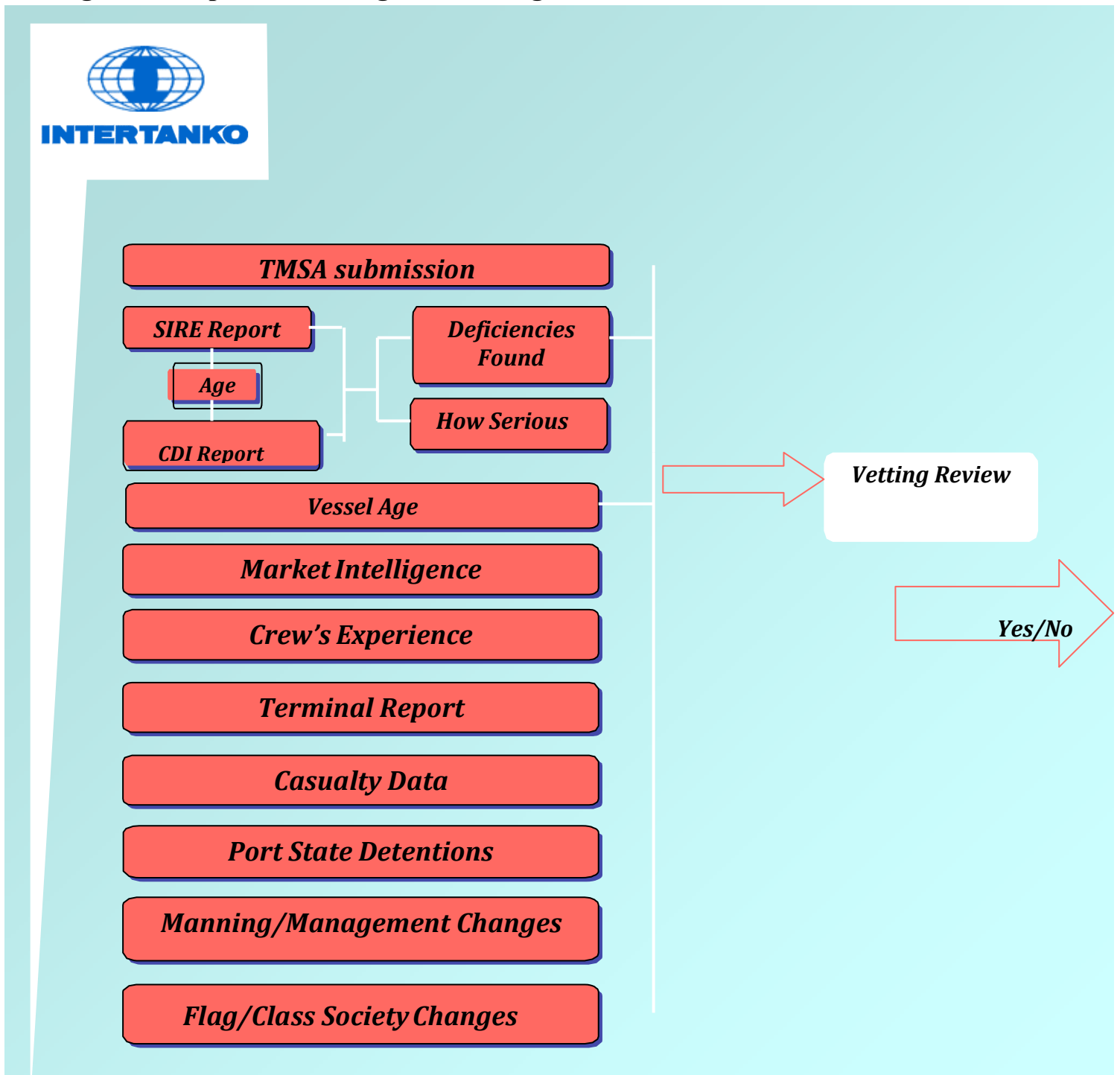
Source: TMSA 2, INTERTANKO, (2008)

However, it has to be said that this flowchart was taken from the TMSA1 and is no longer part of the TMSA2. But the basic idea that the Elements are assessed according to this downstream structure is still being followed by the majority of the oil majors. Nevertheless, there are some oil majors who are not asking for a fulfillment in succession, in fact, they are requiring that special stages have been met, irrespective if they have fulfilled previous stages or not. Thus, it can be said that their requirements are jumping through different stages of elements and consequently, a uniform stage-to-stage development is disrupted. This is a problem as the TMSA is only once submitted via the OCIMF TMSA Internet platform to oil majors, which have been beforehand identified by the tanker operator. This can lead to the fact that the oil majors for which the majority awaits to get a self assessment stating one stage getting a self assessment referring to different stages in different Elements. Consequently, the TMSA becomes to a bigger bureaucratic burden than it would have to and the stage-to-stage continuous improvement process is therefore jeopardized because the focus falls on the fulfillment of requirements rather than on a straightforward self-assessment. This is a major problem which has to be solved and in the practice in a manner which is not ideal.

Nevertheless, the industry experience shows that the majority of the oil majors are requesting the completion of the stages in succession, and, therefore, this is also the approach, which is being assumed within this thesis. Changes within the company and/ or organisational structure should be changed immediately, otherwise the TMSA report should be regularly reviewed, at least annually (OCIMF 2008). Turker stated, as already discussed, that "the TMSA is in fact a quality management system standard" because it shows similarities to ISO 9001. With regard to the "Plan-Do-Check-Act" process and the underlying principle of continuous improvement, the TMSA is addressing issues beyond the ISM Code. Especially the focus within the TMSA on a continuous stage-to-stage improvement, the necessity of performance measurement and management becomes obvious because in order to improve itself, a company must know where it stands. This is also true for the general vetting procedure, as operators do not like negative surprises after a vetting inspection, it is of utmost importance to monitor the own performance (Turker & Er 2008).

On the whole, an increasing number of vetting organisations and consequently, charterers are requiring the TMSA. Furthermore, it is expected by these vetting organisations that the companies who are preparing the TMSA will use same for a performance measurement and consequently for the improvement of their shore based organisation and especially to improve their SMS. Due to the fact that the TMSA encourage a continuous improvement it is not only a tool like the ISO standards, in fact it is, due to the continuous improvement, already in line with the ISM Code, which is of course understandable because it was established to monitor a companies ISM Code compliance (Knowles 2010). Consequently, in order to gain the maximum benefits from TMSA's feedback, changes within the company and/ or organisational structure should be changed immediately, otherwise the TMSA report should be regularly reviewed, at least annually (OCIMF, 2008).

Figure 3: Inspection Vetting & Screening



Source: Paris MoU PSC Familiarisation Course Part 2. (2011)

Chapter 5: Importance of Vetting through case study presentation

Within this chapter is presented the event of a tanker grounding M/T “Y”, through this case it is aimed to underline the importance of vetting and the side effects of the incident on commercial and economic basis. Due to the sensitive nature of such incidents and due to confidentiality reasons the references that are being used there are not named. The case study is based on real events product of our research, in order to demonstrate the incident response considerations and remedial actions an organization could experience. Should any further information is required, same are available upon request.

5.1 Summary of Events

On January 18th 2012 M/T ‘Y’ was purchased and on February 17th she was delivered to new Owners and under Company’s Management. On March 12th 2012 all certificates were issued (i.e. new SMC, ISSC and all Class and statutory certificates). For about two (2) months M/T ‘Y’ was at Hirtshals, Denmark for repairs/ surveys/ maintenance jobs and training / familiarization of the crew. During the above period, a Company’s shore team (the Technical Manager together with a Superintendent Engineer, Superintendent Electrician, Assistant Superintendent Engineer and Port Captain as well as five (5) members of company’s flying squad had also boarded the vessel. M/T ‘Y’ sailed from Hirtshals after two (2) months from her acquisition date i.e. on March 21st 2012 and anchored off Copenhagen, awaiting orders. On March 22nd 2012, she received orders to proceed to Riga, Latvia for loading. On the same day, at 09.30 hrs., she sailed in ballast condition. On March 22nd 2012, at 10.15 hrs, and while transiting Sound Channel, M/T ‘Y’ ran aground. While the Master had ship's con, he instructed the Helmsman (A/B) to alter course to stbd. 183° instead of 163°, as per Passage Plan, which eventually resulted to vessel’s grounding. Following vessel’s grounding, the vessel was detained by the Danish Authorities (the Authorities also performed a breathalyser test, which showed that the Master was intoxicated). Moreover, a doctor embarked M/T ‘Y’ on the same day, at 13.35 hrs, to perform a blood test. At 14.45 hrs, two (2) policemen from Copenhagen Police boarded the vessel and at 15.20 hrs, they escorted the Master ashore. On March 23rd 2012, the vessel was refloated as per approved Salvage Plan and anchored at Copenhagen anchorage on March 23rd 2012, at 22.50 hrs. Following diver’s inspection and Classification Society’s approval M/T Y was released by Danish Authorities and sailed for loading to Riga.

5.2 Company's Navigation Procedures

The safety of the vessel herself, the crew, the cargo and the protection of the environment is the foremost objective in the navigation process, which is a dynamic process. Navigational safety requires selection of courses and speeds that provide a margin of safety which takes into account all of the influences which could affect the vessel's progress, and is dependent upon the prevailing conditions and location. In this respect, the Company considers the navigation of a vessel as one of the key shipboard operations and has established navigational practices and Bridge procedures in line with the regulatory framework and Company's policies.

5.3. Company's D&A Policy - Company Policy Regarding Employee Drug And Alcohol Abuse

A Shipping Company has developed and implemented a ZERO Drug & Alcohol Policy aiming at the safe ship operation, prevention of human injury or loss of life, protection of the environment and property loss prevention. This Policy exceeds the recommendations contained in OCIMF's "Guidelines for the Control of Drugs and Alcohol on board ship".

Shipping Company, recognizing the importance of this issue, is enforcing the following:

1. Any form of drug with the exception of prescribed drugs is banned from the Company's vessels. Also, personnel on prescribed drugs must declare this fact to the Master upon joining the vessel or upon prescription if prescribed during the period of service on board.
2. Any crew member found involved in any drug related activity will be considered in breach of this Policy. Depending on the nature of involvement Authorities may be notified and/or legal prosecution may be initiated.
3. Drugs kept in medical chest must be locked under Master's responsibility and control.
4. It is strictly prohibited to bring and/or consume alcohol on board all vessels.
5. Officers and ratings must observe a period of minimum 4 hours abstinence from alcohol (in case of consuming alcohol while ashore) prior to scheduled watch keeping duty or work periods, in order to ensure that blood alcohol content (BAC) is zero. Testing procedure or accommodation searches might be initiated if it is deemed necessary due to suspicion of breach of the alcohol abstinence by a crew member.
6. The Company maintains a system based on breathalysers and random testing by urine samples. This Policy includes:
 - Testing prior to employment on one of "A"'s vessels

- Monthly unannounced Alcohol tests of all crewmembers using breathalyser
- Drug and Alcohol test of all crew, carried out and analysed by an external laboratory at intervals of time that do not exceed a period of 4 months. The above specified intervals will be followed given that the safe operation and the vessel's trade allow sample collection. In case of a delay due to the above reasons, the test should be carried out at the earliest available opportunity.
- In the event of an incident which results in damage to property, personnel or environment, crew members involved in the incident will undergo a drug and alcohol test
- Upon demand from the Authorities, and in order to investigate any illegal use of alcohol and/or substances, testing of Ship's Officers and Ratings may take place. Such testing shall be carried out in accordance with Company Procedures

Any crew members found to be in breach of this Policy will be dismissed and any future employment with our Company will be cancelled.

Compliance with this Policy is mandatory for all Company shipboard personnel, as well as for all persons boarding the ship under any capacity, specifically the Master is responsible to ensure compliance and enforce appropriate measures as per the Company's instructions.

5.4 Ship Management Details

Shipping Company provides world-class ship management services that meet or exceed safety, environmental and customer requirements and conducts its operations in a manner, which protects human health and safety, the environment and property.

This is achieved by its total commitment to:

- Continually improving the effectiveness and performance of the SMS.
- Continuously improve safety management skills and competence of shore staff and seagoing personnel, by promoting training, familiarization and drills.
- Implementing, maintaining and communicating this Policy to all Company employees and other interested parties.
- Recognizing that Health, Safety, Quality and Environmental Protection are essential in order to achieve the Company's objectives and they are responsibilities of the top Management.

- Establishing, promoting, monitoring and reviewing Safety, Quality and Environmental Objectives in order to materialize this Policy.
- Ensuring compliance with mandatory rules and regulations and that applicable Codes, guidelines and standards recommended by the IMO, relevant Flag Administrations, Classification Societies and Maritime industry organization are taken into account.
- Providing adequate resources to promote this Policy.
- Establishing safeguards against all identified risks to Life, Health, Property and the prevention of Pollution.
- Promoting safe, healthy and environmentally friendly practices and a safe working environment.
- Being prepared for emergencies.

The Company is manned by experienced, adequately qualified and well trained shore personnel and is operating under high quality standards. Since the standards set by the ISM Code are considered as minimum and the target of ZERO spills – ZERO incidents is the Company's ultimate goal, the Company has fully adopted the OCIMF TMSA system and has submitted its self assessment to the OCIMF TMSA database.

5.5 Brief description of Company's standards related to safety management system, maintenance and training

The Company has developed, implemented and maintains a SMS through which aims to achieve safety excellent and incident free operations.

The SMS is based on the following subjects:

- The Health, Safety, Quality and Environmental policy developed by the Company.
- Allocation of appropriate and sufficient resources for the support of the vessels.
- Instructions and procedures, in compliance with the relevant National and International legislation, in order to ensure the safe operation of ships and the protection of the environment.
- Practices and industry guidelines as regards all the shipboard operations.
- Defined levels of authorities, responsibilities and lines of communication between, and amongst, shore based and seagoing personnel.
- Procedures for reporting and analyzing of non-conformities, incidents, accidents and hazardous occurrences reports.
- Application of a condition monitoring and prevention-based Planned Maintenance System to safeguard the vessel's condition at safe levels at all times.

- Procedures and establishment of an internal audit system and management reviews to evaluate the performance and effectiveness of the System.
- Integration of efficient shore and onboard contingency plans to prepare for response to emergency situations.
- Document control for supporting the proper implementation of the System and for ensuring that all controlled documents remain legible, up-to-date and maintained in an orderly manner. In order to ensure that the structural integrity of all managed vessels is maintained according to the Company, Class, Charterers and Flag Administration standards, as well as to eliminate, as far as practicable, the possibility of breakdowns with serious safety, environmental and commercial consequences, the Company has established a PMS covering the following:
 - Steel structure.
 - Deck machinery and equipment.
 - Cargo machinery and equipment.
 - Navigation and Communication equipment.
 - Safety and Fire Fighting Equipment, etc.

All relevant PMS reports/records are available both onboard and at the Company's premises and demonstrate the good operational and maintenance conditions of the subject vessel and all its equipment and machinery. M/T 'Y' has a complete set of valid Certificates while the records of various Port State Control and Terminal inspections are satisfactory. The Officers and ratings are Russian and Ukrainian nationals. All Deck Officers are fully certified and properly trained for navigation watch. All personnel serving on M/T 'Y' are in possession of valid Certificates of competence as well as training certificates, issued and endorsed according to STCW requirements, which are considered as minimum by the Company. The vessel conducted regular drills and the Master was strongly committed towards the full participation of the crew in the drills and towards the full implementation of the Company's Safety Management System. At the time of the incident, all navigational equipment was in perfect condition. The proper working condition of the navigational equipment had been checked/ensured by the OOW during pre-arrival, as per Company's procedure 'Maintenance/Checks & Tests – Familiarization & Use of the Navigation Equipment'. Moreover, all equipment had been also checked during vessel's recent DNV class surveys (i.e. Radio survey) and also checked by Company's external specialist / technician as well as by local radio technicians (i.e. SSAS, LRIT, AIS, EPIRB, VDR, RADAR, GMDSS etc.).

5.6 Manning

“A” Shipping Company mans all its managed vessels to standards that exceed those mandated by the Minimum Safe Manning Certificate requirements, as the latter are defined by the vessel’s Flag Administration. As regards M/T ‘Y’, the Minimum Safe Manning requires fourteen (14) crewmembers and the vessel was manned with twenty-three (23) Seamen.

5.7 Bridge Team Management

In order for the Company to ensure the safe navigation of the vessel through an effective Bridge organization and watchkeeping, has determined through its SMS the procedures for an effective Bridge organization and watchkeeping. Through this procedure, the Company recognizes that the Bridge watchkeeping level must be set always in consideration of the certain prevailing and/or anticipated conditions to ensure safe navigation, eliminate the risk of one man error and restrict overload duties of the OOBW. Furthermore, the Company defines the participation, organization and cooperation of additional OOBW among Bridge Team members including Master, as well as support of extra deck crew (A/B) for “ELEVATED” Bridge watchkeeping conditions.

5.8 Bridge Equipment

M/T ‘Y’ was equipped with first rate navigation aids, which deliver real time, visual imaging of the vessel’s position with superior accuracy. Navigational systems and equipment, essential for the safe navigation of the vessel are the following such as Communication systems include INMARSAT satellite communication system, GMDSS station and approved type portable VHF devices. The Company in its SMS has established procedures for the consistent monitoring of the performance of navigation equipment, as well as measures for their reliability and defect reporting. It is specifically stated that:

“The Company, in order to ensure the good maintenance and operational readiness of navigational equipment, has available under contract suitably trained staff, capable of maintaining electronic navigational equipment”. Moreover, explicit instructions are in place for all navigational equipment to be maintained fully operational, as well as for the immediate notification of any critical navigational equipment failure, through Company’s established defect reporting system. It is the primary responsibility of the vessel’s Bridge Team to be fully familiar with all navigation equipment, to make proper use of the navigation aids, and above all, to be aware at all times of the vessel’s position.

5.9 Potential Causes Examination

This process is being followed in order to examine/identify any potential link to this incident because of the following:

1. Established Navigation procedures

From reviewing the Company's SMS, it was found that the Company has very detailed navigational procedures that the Bridge team members should follow. Consequently lack of implementation of established navigation procedures could not be considered a cause for the grounding incident.

2. Drug and Alcohol policy

The Company has banned alcohol from all its managed vessels, implementing an alcohol-dry policy. The Master, Officers and crew were subject to Drug and Alcohol examination prior to their embarkation, with negative results. An external D&A test was performed on March 14th 2012, on completion of vessel's repairs / surveys, with negative results. Unannounced alcohol checks are conducted onboard at least monthly, for all Officers and crew by the use of portable breath analysers. The last check was conducted with negative results. Furthermore, according to Company procedures, the Master may carry out such tests in any other instances he might consider necessary. Annual unannounced Drug and Alcohol test by shore laboratory is carried out onboard. The last annual unannounced Drug and Alcohol test was carried out with negative results. Additionally, an external D&A test was performed on March 23rd 2012, after the incident and as soon as the new Master, Cpt. X took over the command of M/T 'Y'. Lack of Drug and Alcohol policy could NOT be considered a cause for the grounding incident.

3. Equipment and systems related with vessel's navigation

The equipment and systems of M/T 'Y' related with the vessel's navigation were efficient and in good working order, without any malfunctions, as derived from the vessel's pre-arrival, pre-departure and daily inspections as well as from the results of routine maintenance inspections (as per Company's Planned Maintenance System). Moreover, all equipment had been also checked during vessel's recent DNV class surveys (i.e. Radio survey) and also checked by Company's external specialist / technician as well as by local radio technicians (i.e. SSAS, LRIT, AIS, EPIRB, VDR, RADAR, GMDSS etc.). Furthermore, it should be noted that no system malfunction or equipment failure was reported by the vessel. No failure of the equipment and system related with the vessel's navigation was observed. Therefore, it could not be considered a cause for the grounding incident.

4. M/E and rudder

From the available evidence (related documents and crew testimonies), the Investigation team reached the conclusion that at the time of the incident, all equipment, including M/E and rudder were in perfect working condition. No failure of the M/E and rudder was observed. Therefore, it could not be considered a cause for the grounding incident.

5. Rules, regulations and procedures

The following rules are applicable in this incident:

- STCW in which the minimum certification and watchkeeping requirements and conditions are given for the safe navigation of the vessels by competent and qualified Officers and crew and
- The SMS through which, the Company has established and maintains specific procedures, guidelines and instructions for the safe navigation of the managed vessels in accordance with the above regulations and other Industry guidelines/recommendations (Bridge Procedure Guide, etc.). It is apparent that the assumption of the inexistence of rules, regulations and procedures could not be considered a cause for the grounding incident.

6. Company's familiarization and training procedures for the shipboard personnel

From reviewing the Company's SMS, it was found that the Company has very detailed familiarization procedures for the OOBW regarding the operation, inspection, testing and maintenance of navigational equipment and systems. Furthermore, various training procedures and schemes for the OOBW and crewmembers involved in Bridge watchkeeping have been also established in the Company's computerized Training Plan. Individual training records and familiarization/briefing forms are available, demonstrating the prior-embarkation training and briefing, as well as the induction and ongoing training on applicable safety and environmental protection rules and regulations received by all Officers and crew of M/T 'Y', during their service onboard. Moreover, the Master and Officers are holders of training certificates above the minimum requirements of the STCW (BTM/BRM, etc.). From the available evidence, the lack of Company's familiarization and training procedures for the shipboard personnel could not be considered a cause for the grounding incident.

7. Passage planning

Prior to departure from Copenhagen anchorage, the 2nd Officer prepared a detailed passage plan for the voyage to Riga using the standard company form in accordance with owners' Safety Management System (SMS). The plan was approved by the Master, it was also reviewed and then signed by the Chief Officer and Third Officer before the vessel left

Copenhagen. The lack of Passage Plan could not be considered a cause for the grounding incident.

8. Fatigue

Fatigue was not suspected for any aspect of this incident, since the watch/rest hours schedule was fully examined.

- The vessel was manned with a number of crew over and above the Minimum Safe Manning Certificate.
- The working / rest hours of Officers and crew were according to ILO 180.
- It should be noted that the vessel was waiting orders at Copenhagen anchorage from March 12th – 21st 2012. Fatigue could not be considered a cause for the grounding incident.

9. Special emergency circumstances

The vessel was not experiencing an emergency situation, this was verified through testimonies of the Officers and crew as well as by the Bridge and Engine Log book entries. No emergency situation was experienced by the vessel, therefore, it could not be considered a cause for the grounding incident.

10. Weather Conditions

The weather conditions were favorable, therefore they did not contribute to this incident, so weather conditions could not be considered a cause for the grounding incident.

11. Vessel's condition (inherent vice) requiring any extraordinary effort in implementing specific procedures and practices

From available records and analysis of vessel's relevant documents, there is no such evidence to show that the condition of the vessel was requiring the implementation of specific procedures and practices being followed by the shipboard personnel. Vessel's condition (inherent vice) was not requiring any extraordinary effort in implementing specific procedures and practices onboard. Therefore, it could not be considered a cause for the grounding incident.

12. Commercial pressure

No commercial pressure issues were raised by any Officer or crewmember during the incident investigation. Commercial pressure could not be considered a cause for the grounding incident.

13. Cultural issues

No cultural issues were identified between Officers and crewmembers during the incident investigation, consequently cultural issues could not be considered a cause for the grounding

incident. From the analysis it was evident that the above-mentioned causes, numbered from 1 to 13, could not be considered as possible causes for the grounding incident.

5.10 Root Cause And Contributing Factors

It is well known that for virtually every incident, some improvements in the SMS could have prevented most (or all) of the contributing events from occurring. Even in instances where individual personal performance was the cause of an incident, the SMS that is used to select, train and supervise personnel should be reviewed to determine if improvements are necessary. Therefore, the absence, negligence or deficiencies of SMS features are fundamentally the root causes of most incidents.

5.11 Root Cause Determination

After examining all relevant details, supporting evidence, crew statements as well as all the place and occurrence of the grounding and the potential, the Investigation Team reached the following conclusion:

-Master's Error

The Master's error is the cause that led to the grounding of M/T 'Y' on March 22nd 2012, while transiting the Sound Channel.

This conclusion derives from the following facts:

- a) At the time of the incident, the vessel was under the con of the Master.
- b) The Bridge Team had at their direct disposal all advanced electronic navigational aids i.e. DGPS, radars, accurate in real time to the order of a few meters. M/T 'Y' was equipped with first-rate navigational aids, which deliver real time visual imaging of the vessel's position with a superior accuracy. Furthermore, the Bridge Team Members were adequately trained for making proper use of these navigational aids, and above all for being aware at all times of the vessel's position. The OOBW having continuous radar display and proper interpretation of the displayed information and fixed vessel's position, highlighted to the Master that he should not alter course to stbd and he should had followed company's navigation procedures. However, the Master seems to have ignored OOBW's suggestion. Notwithstanding the above, the Master failed to make proper use of the resources at his disposal in order to ensure the safety of the vessel. Given the above examination of the factors that led to incident of grounding it is obvious that the Situational Awareness of the Master was not in the desirable level. Situational awareness is the accurate perception of factors and conditions that affect a vessel and its crew during a defined period of time. More simply stated, it means "know what is going on around you". The safety of the voyage depends on the level of situational

awareness of the individual who has the conduct (con) of the vessel, or the Bridge Team respectively. The ease and effectiveness of communication is fundamental factor in maintaining optimal situational awareness. It is essential that each BT member does everything feasible supporting the person in charge to maximize his level of situational awareness. As of the above, it is evident that the situational awareness or actually the accurate perception of factors and conditions of the Master during vessel's transiting Sound Channel was not in the level that could prevent this incident. More specifically, the Master's situational awareness was not on the level that could prevent the incident from occurring.

5.12 Conclusions

To conclude, the root cause of the vessel's grounding is demonstrably a Master's error, the Master failed to follow the planned route, which led the vessel to sail in a dangerous for navigation area and eventually ran ground. However, beside the main root cause there were some Contributing factors that finally led to the grounding of the M/T "Y". The contributing factors are focused on the:

- 1. Master:** Following vessel's grounding, an alcohol test revealed that the Master was under the influence of alcohol, which is an obvious contributing factor to this incident.
- 2. Officer on Bridge Watch:** The OOBW in place did not challenge effectively Master's decision to make the Master feel that his order to the Helmsman was erroneous.

5.13 Recommendations and Actions to be taken

Recommendations are the most important products after an incident investigation. In addition to addressing the higher- level causes of the incident, their scope is to address SMS improvements aimed at a problem's root causes. The only acceptable recommendations are those that can actually be implemented and later proven to be effective. In general terms recommendations must be practical, feasible and achievable and should be assigned to someone along with a completion date. Of course, what is practical, feasible and achievable varies significantly among Shipping Companies. It must be recognised that has extremely low levels of risk acceptance and risk tolerance. "A" Shipping Company has established, maintains and consistently applies high standards of navigational practices, Bridge procedures and deck-officer training in line with regulatory and Company's policies that secure safety of the vessel, the crew, the environment and the cargo. Management commitment is visible and is clearly defined in the Company's documentation and senior management demonstrates a clear and active commitment to implementing the Safety Management System (SMS).

The following recommendations were developed after the data analysis (collected during the investigation) and identification of underlying causes (performed as part of a root cause analysis) were completed. Recommendations are directly tied to causal factors and their underlying causes. Implementing a recommendation should eliminate the causal factor and the underlying root causes. The main objective was to propose recommendations effective in eliminating similar incidents that have large benefits and, as far as possible, minimal negative impacts or costs. Recommendations have been written to provide measurable completion criteria, in other words, it should be possible to definitively determine if the recommendation has been completed or not, recommendations need to be reviewed as part of the Management of Change procedure to ensure that they solve more problems than they create.

5.14 Summary of actions taken or to be taken

1. On March 22nd 2012 the Master, Mr. A, was replaced at the port of Copenhagen.
2. Company's Senior Master, Cpt. B, flew immediately on March 22nd 2012 in order to board vessel, initially assist the Master, Mr. A and finally take over the command of M/T 'Y'.
3. On March 23rd 2012, the Management dispatched onboard Superintendent Engineer, Mr. X, accompanied by an independent 3rd party investigator in order to assess the situation on the spot and carry out an initial investigation.
4. The vessel was refloated as per approved Salvage Plan, on March 23rd 2012, on the same day, the vessel was anchored at Copenhagen anchorage, DNV and divers inspected M/T 'Y' on March, on March 24th 2012 the vessel was released by the Danish Authorities.
5. An additional unannounced D&A test has been carried out onboard all company's vessels.
6. A Safety Bulletin has been drafted and forwarded to all managed vessels incorporating the following paragraph related to Navigation with Master having the con: "Taking into consideration the critical importance of continuous and precise monitoring of vessel's position in real time during all stages of pilotage, the OOBW to exercise careful discretion in establishing the most efficient primary position fixing methods to be used. His selections to be made so as to gain maximum benefit from those particular advantages which its method (e.g. radar, etc.) has to offer. Success in this process will ensure that the OOBW will quickly be made aware whenever the vessel's position diverges from the Passage Plan and in particular if the vessel is headed towards danger. Under these circumstances, immediate intervention/notification to be made to the Master

in concept with the simultaneous application of those course correction measures required to avoid danger.” On occasion of the aforementioned, Company’s SMS has been also amended in this respect.

7. The Masters of all managed vessels should discuss this grounding incident in an extra Safety Committee meeting, which should be attended by all Officers and crew members performing a Bridge watch.
8. A special Company Management Review meeting has been conducted where the ‘grounding’ incident and controls and procedures to avoid recurrence have been discussed.
9. A Safety Campaign has been launched with the topic: ‘Any shipboard personnel member being identified / suspected as intoxicated, should be immediately reported to the DPA, by any means available’.
10. The Company has decided to implement procedures in order to conduct distant unannounced Alcohol tests.
11. Following Master’s identification being intoxicated, the Manning Agent and the Crew Manager were instructed to conduct additional D&A tests and psychometric assessments for the Company to all Senior shipboard personnel joining the Company for the first time (At this point, it should be highlighted that the Master sailed for the first time with the Company and he was hired because of his previous services with the subject vessel).
12. The Company has decided to conduct ongoing assessment for job competence and training for Masters and Navigating Officers. Amongst others, psychological assessment should be used to confirm job competence and adherence even to routine tasks. Furthermore, it was decided that the SMS should enhance the periodic assessments of the shipboard personnel’s qualifications and abilities to meet specified job requirements, identify any development requirements, including additional training needs and comments on the appraisee’s awareness and performance.
13. The Company has decided to conduct a full review of the SMS as well as an associated Work Risk Assessment related to Navigational procedures during approaching and transiting narrow Channels with Master having the con. A Risk Assessment with hypothetical scenarios related to approaching and transiting Channels or any other hypothetical scenario arising from this incident should also be conducted. Results should be followed and monitored by Shore Management.

14. Additional periodic 3rd party training should be organized in BTM / BRM and Ship Handling for Company's Navigating Officers. Also, periodic refresher training should be provided wherever needs are identified, and at the established three (3) years intervals in order to meet job requirements and to ensure understanding of the proper protective measures to mitigate potential hazards.
15. The Company has established a documented process for conducting on-board real time navigational audits by independent and qualified shore staff. The performance and effectiveness of Bridge management teams is continuously monitored and every effort is made in order for similar situations to be detected as soon as they appear. The frequency of these audits is specified and their effectiveness and results are closely monitored. Action points from these audits are assigned and verified as completed.
16. Internal and external audit reports from the fleet have been analysed to identify weak areas in Navigational procedures and appropriate actions have been taken to improve procedures and resolve problems. The Company has identified and documented trends from navigational audits, set improvement targets and tracked these to completion.
17. Even though the Management had instructed the Masters of all managed vessels to freely engage Sea Pilots, whenever they wished so, it has been decided from now on, that they will compulsorily engage Sea Pilots when transiting Belts / Sound.

5.15 Communicating the investigation results

Communicating the results of the investigation is an important aspect of the investigation process, the outcome of this incident investigation, the root cause analysis and the recommendations, in the concept of lesson learnt, should be communicated to all Company's vessels, all those who are affected by the corrective/preventive actions, and all other interested parties. It is also important that those personnel who assisted the Investigation Team be made personally aware of the investigation results, they invested time in helping the Investigation Team, so they want to see that something useful was done with the information they provided or helped to acquire. The following provides some ideas about the possibilities for report distribution:

- **Relevant Personnel with Policy and Procedure Responsibility.** Those personnel responsible for managing the upkeep and update of policies and procedures should be provided with the report to determine if changes to the SMS are necessary as a part of the formal corrective/preventative action system.

- **Affected Employees.** They will want to know what to do differently and what the Company is doing to make sure this type of incident does not happen in the future.
- **All Employees.** Is there a lesson to be learnt by everyone? Keep this type of communication short and to the point. Tell them what they need to know and why; nothing more or the primary message will get lost in all the extra information.
- **Other Company's Vessels.** Other Company vessels can learn from this incident. The communication should provide sufficient information without unnecessary detail.

5.16 Importance of Vetting

Through the analysis of the above-mentioned incident of grounding it is pursued to stress out the side effects caused not only to the directly associated vessel but also to the whole fleet managed by the Shipping Management Company.

Particularly, right after the above mentioned incident the company was called, at first place, to handle the media and all the regulatory bodies involved. It is a matter of utmost importance, especially in the tanker market sector given that it is commonly known that oil majors do whatever it takes in order to avoid any potential liability with an incident especially one with an environmental impact, in order not be correlated with any possible environmental hazard. Society's tolerance of industrial accidents has dropped dramatically during the last decades. As incidents increasingly come under public scrutiny, even small-scale issues have the potential to diminish a company's brand value. On point, the 'Y' company's first immediate actions taken was to prepare a crisis communication plan which included a section regarding the way that would handle hostile and persistent media inquiries following the incident. The majority of oil majors demand this basic tool and vetting agencies in the oil industry now and most tanker operators are aware of this requirement. Furthermore, a designated company's spokesman was appointed to handle broadcast media interviews. Crises in the shipping industry can strike at any moment therefore another key aspect of tackling the media issue is taking time out to prepare as much basic information as possible in advance. Since Exxon Valdez in 1989, the industry has been trying to improve its image and many responsible owners today realize the media can be used in a positive way to protect a company's corporate reputation during a shipping crisis. Once under the media spotlight, journalists try to know everything about the directly connected company and not just about the accident itself. Thus, factsheets, biographical profiles of masters and key company executives, were prepared. Statements were also prepared with clearly defined corporate messages expressing regret and shared concern with the community.

Additionally, another consequence of the aforementioned incident was the loss of all valid approvals by the oil majors that the company had gained until then. Consequently, that meant they should start all over again in order to reach the same position possessed in the tanker market before the incident. Oil major approval of tanker vessels, or the process by which an oil major determines whether a vessel is suitable to be chartered based on the information available to the company, is both a common and wide spread practice in the tanker industry. Some oil majors may have additional and more cases specific requirements. Tanker owners often seek to maintain as many written approvals of their vessels from oil majors as possible as a mean of demonstrating not only the quality of their vessels, but also acceptability to potential charterers and it is something which they frequently demand.

After the incident a report was drafted on the immediate actions that should be taken. Such as the immediate replacement of the Master of the vessel. Another immediate action taken by the Management was that a Superintendent Engineer was dispatched onboard accompanied by an independent 3rd party investigator in order to assess the situation on the spot and carry out an initial investigation. Furthermore, an additional unannounced D&A test was carried out on all company's vessels. A second incident investigation report on the vessel's grounding was drafted and issued by Third Party Auditors/Inspectors. The purpose of this incident investigation was not to apportion liability but determine its' circumstances and the contributory causes, to attempt the identification and analysis of relevant safety issues. Additionally, recommendations for preventing similar incidents were proposed so possible re-occurrences can be avoided in the future. The report constituted a compendium of the investigation, analysis, conclusions and recommendations. It had been compiled with following statements from: the Master, Officers and crewmembers of M/T 'Y', key shore personnel, examinations of log books, checklists, forms, print outs, photos, charts, procedures, AIS VIDEO extract from vessels transiting the area of the incident, information exchange, voyage correspondence and numerous other submissions and documents. On the whole this investigation report contained the root causes of the incident, the contributory factors, the immediate and long-term preventive actions.

Just a day before the incident the Shipping Company had gone through TMSA Audit by an Oil Major for a potential time charter business for another managed vessel by the shipping company which had a positive outcome. Unfortunately, when the oil major was notified for the event of the incident and cancelled the potential business. The management company in

order to proceed on the aforementioned fixture handed over the management of subject vessel to a Third Party Management company so as to take maintain the fixture. It is obvious, that each and every event that occurs has great impact to the entire fleet of a shipping company. The managed fleet is inseparably connected because all are under the same management and its procedures. After the incident it was extremely difficult for the shipping company to arrange a vetting inspection to the specific vessel due to the fact that the oil majors had the vessel on “Technical Hold” for one year. It is noted that three years post incident there were clear signs of improvement of the vetting results and positive observations.

It is obvious that after the aforementioned incident of the grounding there were not only commercial side effects, regarding to the difficulty of possible fixtures but there were also and economic consequences. Particularly, it goes without saying that by giving a tanker of company’s fleet to a third party management diminishes at a great extent company’s profits. Furthermore, the fact that the M/T “Y” faced the difficulty to be fixed for more than one year, as we can understand the management company was the one that should cover the operating expenses of the above mentioned vessel, a fact that long-term leads to major economical loses.

Chapter 6: Conclusions

This thesis presents the underlying principles, which led to a quality and environmentally friendly industry. It also depicts that the maritime industry have undergone a major change in attitude over the last decades. A focus on quality, safety and ultimately the environment was developed in this industry driven by serious incidents, both involving humans and environment. The development of tanker vetting schemes, the increasing employment of quality management systems, establishment of an international mandatory quality standard for the shipping industry and the International Safety Management Code, all reflect this change in attitude. These developments have stretched out for more than two decades forming the vetting procedure. As the underlying reason for vetting is driven by the growing awareness of the potential damage caused by large scale pollution. Especially when it comes to shipping companies that are occupied in such a volatile environment where everything is literally liquid the importance of being in line with “markets requirements” plays a vital role.

Charterers, i.e. the oil majors, became aware that there was an insufficient supply of well and safely managed vessels. Oldham further states that this was not due to a lack of regulations rather than the lack of enforcement. He had already stressed this lack of enforcement and required to “make life difficult for the offenders”. At first, the main focus was the safe operation of vessels, but within the recent years, it has shifted to contributing to the sustainable use of the world’s resources and, therefore, to environmental management systems. Furthermore, the TSMA also has to be seen, in many respects, as a performance measurement system, especially due to its background as an assessment of a tanker operator’s compliance to the ISM Code and its performance under the ISM Code.

Taking into consideration that the vetting process consists of much more than the actual vetting inspection, the TMSA is a valuable initiative for the tanker owners to know how to best prepare themselves for the vetting procedure. It provides a strong indicator of what oil and chemical companies will expect from a good management system. This is also an important tool when considering using vessels with companies not previously in cooperation with the oil major. These reviews serve to evaluate not only the vessel itself but the company owning or operating the vessel in order to assess risk.

Taking all the above into consideration Vetting and TMSA can be defined as intangible assets, perhaps the most important ones, for the continual improvement and sustainability of a shipping company.

Concluding, through the presentation of the above case of incident it was made clear that regardless of the subject vessel that was directly related to the incident, this event affected other vessels that were under company's management. Through the analysis and the study of a real case of grounding one can easily acknowledge the economic risk that is involved for a shipping company in the event of such incident. So, it is obvious that the operators should be extremely cautious with each and every aspect that may affect their company status and the quality of their transportation services. On the whole this incident has highlighted the elevated difficulties that the operators met in their effort to gain back their previous status.

Bibliography

- Biebig, P., Althof, W. & Wagener, N. (2008). *Seeverkehrswirtschaft*, 4th Ed. Munich: Oldenbourg.
 - Haralambides, H.E. (Ed.). (1998). *Quality shipping - market mechanisms for safer shipping and cleaner oceans*. Rotterdam: Erasmus Publishing.
 - International Oil Pollution Compensation Fund 1992, (2004). *The Role Of Sire In The Vetting Of Tankers*, Third Intersessional Working Group Agenda item 2.
 - INTERTANKO (2008). *Tanker Management and Self Assessment 2*, 2nd Edition.
 - INTERTANKO, (2015). *Guide to the Vetting Process*, 11th ed.
 - INTERTANKO, (2017), *Tanker Management Self Assessment 3*, 3rd Edition.
 - Kaps, H. (1999), *Tanker Operations. Lecturing notes on tanker operations including the terms of STCW Code A-V/1 (Tanker Familiarization)*, Version 1.0, University of Applied Sciences Bremen.
 - Knowles, T. (2010), *Tanker Vetting - Understanding the Issues Involved*, Witherbys Publishing & Seamanship International.
 - OCIMF, (2014), *Ship Inspection Report (SIRE) program*. Available at: <https://www.ocimf.org/media/53578/SIRE.pdf>.
 - OCIMF, *Tanker Management and Self Assessment (TMSA)*. Available at: <https://www.ocimf.org/media/8874/TMSA.pdf>.
 - OCIMF, (2014), *VIQ 6*, ed. 1.2., Available at: <https://www.ocimf.org/media/58881/VIQ-2014-Rev-12-Final.pdf>.
 - Standard Club (2011), *Standard Bulletin: Oil Major Vetting And 'Approvals'*, HelenMcCormick Available at: <http://www.standard-club.com/media/1557969/oil-major-vetting-and-approvals.pdf>.
 - Paris MoU PSC Familiarisation Course Part 2. (2011), *Inspection Vetting & Screening*, Capt. Howard N. Snaith FNI.
 - TMSA3 FAQs. Available at: <https://www.ocimf.org/media/61518/TMSA3-FAQs.pdf>
 - TMSA3 Fast Facts. Available at: <https://www.ocimf.org/media/61527/TMSA3-Fast-Facts.pdf>.
- Journal**
- Turker, F. & Er, D. (2008), 'Enhancing quality and safety management in shipping: Tanker management and self assessment', *Lex et Scientia* (15), p. 128-134.