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***How will the new regulations affect Port
State Control***

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Contents

CHAPTER 1: INTRODUCTION	7
1.1. The importance of shipping in the economy	7
1.2. Purpose of Work	10
1.3. Presentation of Working Methodology	10
1.4. Work Structure	10
CHAPTER 2. LITERATURE REVIEW	12
2.1. Shipping Today	12
2.1.1. World Trade & Shipping	12
2.1.2 Marine Casualty & Airworthiness	13
2.1.3. The International Maritime Organisation (IMO)	15
2.1.4. The Effectiveness of the Regulatory Framework in Shipping	16
2.1.5. Review of Articles	17
2.2. INSTITUTIONAL FRAMEWORK	19
2.2.1 Historical development	19
2.2.2 Current institutional framework	20
2.3. PORT STATE CONTROL	22
2.3.1 Introduction	22
2.3.2 General	23
2.3.2.1 International conventions	23
2.3.2.2 National legislation	24
2.3.2.3. Safety Regulation	25
2.4. Port State Control (PSC)	25
2.4.1 Historical context	25
2.4.2 The international context	26
2.4.3 Rights of port authorities	27
2.4.4 Selection of vessels of inspection	28
2.4.5 Databases	29
2.4.6 Reception facilities and port vessels	29
2.5. Memoranda of Understanding & Regional Port State Control Agreements	31
2.5.1. Paris MoU	31
2.5.2. Tokyo MoU	31
2.5.3. Acuerdo Vina Del Mar MoU	33
2.5.4. Indian Ocean MoU	36

2.5.5. Caribbean MoU	37
2.5.6. Black Sea MoU.....	40
2.5.7. Riyadh MoU	42
2.5.8. Abuja MoU	43
2.5.9. Mediterranean MoU	44
2.6. Current factors influencing port state control (psc) implementation	47
CHAPTER 3. RESEARCH METHODOLOGY	48
CHAPTER 4. ANALYSIS.....	49
4.1. Comparative approaches	49
4.2. Review of the latest studies on security controls	53
CHAPTER 5. CONCLUSIONS	58
5.1. Conclusions.....	58
5.2. Limitations and Future Research	59
BIBLIOGRAPHY.....	60

Abstract

In 2011, NIR was developed in the framework of the Paris MoU as a New Inspection Regime, an initiation that drew the attention of many stakeholders and is widely considered an innovation. This New Inspection Regime has the potential to be of considerable influence on enhancing the global PSC inspection system. An assertion can be made with all confidence that proper implementation of the NIR is a sure way to bring about modernization of PSC inspections worldwide. This paper deals with a comparative analysis of periods under the ‘pre-NIR’ (before implementation of the NIR) and ‘post-NIR’ (after the NIR was implemented) using inspection data and information from the online database of Paris MoU. The method used for comparison will present overall changes in inspection results and quality of vessels inspected.

Key words: Port State Control, New Inspection Regime, Port State Control Regulations

CHAPTER 1: INTRODUCTION

1.1. The importance of shipping in the economy

Global trade and the world economy rely heavily on maritime transport, which serves as a foundation. The importance of shipping is often underestimated, despite the fact that it benefits everyone in our world. Ships are responsible for transporting a wide range of goods, including raw materials, food, technology, medicines, vehicles, and even living organisms such as plants and animals. As the population continues to grow, particularly in developing countries, the importance of cost-effective and efficient maritime transport becomes even more critical for sustainable development. By facilitating trade, shipping ensures that the benefits of trade are distributed fairly. No country can thrive in isolation, and every nation depends on maritime trade both to export its goods and to import what it needs (Maritime Transport is "Backbone of Global Trade and the Global Economy", 2021).

The transport of goods by sea, whether it is raw materials, components or finished products, is an integral part of our daily lives. The livelihoods of billions of people in developing countries, as well as the quality of life for those in industrialized and developed countries, depend heavily on ships and the shipping industry. It is worth noting that the shipping industry has played an important role in enhancing global living standards (Maritime Transport is "Backbone of Global Trade and the Global Economy", 2021).

The smooth operation of maritime transport relies heavily on controls and inspections. These critical activities offer valuable services to the company's executives by identifying and preventing any deficiencies that could lead to incidents or accidents. They also include internal audits and monitoring adherence to safety protocols and guidelines. As stated in the Marine Transport report is the "backbone of global trade and the global economy" of 2021, these measures are essential to ensure the efficiency and reliability of global trade (Maritime Transport is "Backbone of Global Trade and the Global Economy", 2021).

When we mention the "maritime industry" or "shipping" as a whole, we include all activities that revolve around and support the transportation of not only physical goods, but also people on the seas. This industry plays a vital role in facilitating international trade for humanity. A nation's merchant navy consists of all merchant ships flying its flag. In addition, the term "shipping" is used to describe the operation of the ship itself, which includes skillful navigation (controlled by the bridge) and propulsion (engine) as well as safe loading of cargo to ensure a

successful voyage from a destination. to another (Maritime Transport is "Backbone of Global Trade and the Global Economy", 2021).

Shipment is also termed as a country's maritime shipping industry which embodies all activities related to sea transport. The term "world maritime industry" is applied to the industries of the different countries which are carried out in accordance with the regulations of the International Maritime Organization (IMO), a London-based United Nations specialized agency, embracing the international conventions, codes and measures of its Member States covering three major areas: the maritime safety, efficiency of navigation and prevention of pollution from ships. "

- Education and Credentialing of Maritime Personnel
- Coverage for human life and assets at sea. Including passengers, vessels, and cargo
- Safeguarding the Marine Ecosystem from pollution. Caused by commercial vessels (Warships are exempt from maritime laws for specific reasons)

The shipping industry, as a whole, is highly complex and strikingly challenging. It encompasses several markets, each with its unique context, supply and demand dynamics, and a shared commitment to professionalism. This industry boasts significant profit potential, but it also carries the risk of harmful mismanagement if it is not addressed. Shipping is of huge importance to the global economy and its fortunes are inextricably linked to global economic conditions. The shipping market is shaped by the interaction between financial aspects and the influence of political transformations, driving its evolution.

The economic importance of shipping, both in the context of a national economy and in the context of the global economy, is essential. The expansion and consolidation of 11 markets globally and the large increase in the volume of world trade was largely the result of the possibility of mass regularity and, at the same time, the transportation of large quantities of raw materials, semi-finished and finished products as well as passengers over long distances. The demand for maritime transport services is created by the demand for goods. From this point of view, it could be argued that shipping has developed because of the development of maritime trade (Papagiannopoulos, 2017).

But the most correct thing is to accept that this is a relationship of interdependence. Without the development of shipping at an initial level it would not have been possible to transport products and direct markets (and economies in general), but also without the increase in production resulting from demand, it would not have been possible to further develop shipping. Without the development of shipping, which results in cheap, reliable and properly supplied

maritime transport, the exchange of goods and services would be far smaller in volume with serious implications for living standards worldwide (Papagiannopoulos, 2017).

The importance of shipping cannot be overstated, as it serves as a vital asset that greatly affects not only the global economy, but also the political and strategic position of nations on the international stage. Europe, in particular, plays a central role as the largest trading partner in global trade, accounting for around 20% of total trade worldwide. The remarkable growth of free trade, both within Europe and throughout the world, is largely due to the indispensable contribution of shipping. With an astonishing 90% of goods transported by sea, it becomes apparent that shipping is the cornerstone and driving force behind international trade (Papagiannopoulos, 2017).

The European Union (EU) relies heavily on maritime transport for both its external and internal trade, with around 90% of external and 37% of internal trade conducted by sea. A recent study conducted by Oxford Economics examined the economic importance of European shipping, revealing that it adds a significant €147 billion to EU GDP on an annual basis (based on 2013 data). In addition, this sector directly and indirectly supports 2.2 million jobs. It is generally accepted that for every 1 million people in the European Union, € contributed by the shipping industry to the EU's GDP, an additional €1.6 million is generated. through economic "multipliers" (Papagiannopoulos, 2017).

Over the last ten years, the Community fleet has experienced significant growth of 75%. Currently, it accounts for about 40% of global tonnage, with Greek-owned ships contributing 50% of this total. Apart from the obvious economic and commercial advantages, a strong Community fleet plays a crucial role in ensuring the European Union's energy independence. This becomes especially important in times of geopolitical crises and uncertainties. Greek shipping is the backbone of European shipping businesses, as evidenced by its remarkable presence in the European fleet. Specifically, 97.5% of its transport activities are conducted between third countries, a practice commonly referred to as "cross-trading". However, Greek shipping continues to hold a prominent position worldwide, boasting a fleet of approximately 5,000 vessels (over 1,000 gt), representing approximately 20% of the total tonnage worldwide. The numerical advantage of Greek shipowners, combined with extensive know-how, experience and high-quality services, contribute to the highly competitive transport services offered by Greek and European shipping. As such, the shipping industry remains an essential

aspect of the identity of both Greece and Europe and plays a key role in their prosperity. (Papagiannopoulos, 2017).

1.2. Purpose of Work

The purpose of this paper is to highlight the importance of inspections on ships. In order to do this, we must first understand certain concepts, but also the way and regulations on which global shipping is based. For this reason, global shipping today, international organizations, State Port Control and various Memoranda of Understanding between states worldwide are presented and analyzed. While the main research question that arises and forms the basis of the existing one is: *How will the new regulations affect Port State Control?*

1.3. Presentation of Working Methodology

In order to fulfill the purpose and objectives of the work it was necessary to use a series of tools, through which important conclusions could be drawn. For the writing of the thesis, secondary research was followed and specifically the search and collection of scientific articles on the internet.

1.4. Work Structure

This paper includes four chapters, the content of which is analyzed below:

Chapter 1: The first chapter of the thesis is the introductory chapter, in which an introduction to the topic of the thesis is made and the purpose of the paper and the methodology used for its writing are presented.

Chapter 2: The second chapter presents shipping today. More specifically, global trade and shipping are presented, the concept and significance of marine casualties and seaworthiness are analyzed, the International Maritime Organization (IMO) is presented and the effectiveness of the regulatory framework in shipping is commented. Next, Port State Control (PSC) is presented. Initially, a conceptual approach and a historical review are carried out and then, the role of Port State Control Inspectors (PSCO), the inspection procedures on board ships, the reasons for more detailed inspection and finally, the shortcomings, reservations, corrections and action codes are presented. Finally, the regional development of Port State Control (PSC) is briefly presented. Presents the Memoranda of Understanding and the regional agreements of Port State Control. More specifically, the following are presented: Paris MoU, Tokyo MoU, Acuerdo Vina Del Mar MoU, Indian Ocean MoU, Caribbean MoU, Black Sea MoU, Riyadh MoU, Abuja MoU, Mediterranean MoU and the case of the USA.

Chapter 3: The third chapter presents the methodological approach used in this thesis.

Chapter 4: This chapter analyzes the results of the bibliographic approach, while illustrating differences in the regulations and procedures for implementing port control over the years.

Chapter 5: Finally, the fifth chapter analyzes with a summary approach the conclusions that emerge from the analysis of the previous chapters, while limitations and suggestions for future research on the issue are depicted.

CHAPTER 2. LITERATURE REVIEW

2.1. Shipping Today

2.1.1. World Trade & Shipping

The importance of maritime transport is evident when we consider the distribution of land and water on our planet. The vast majority, 70% of the Earth's surface is made up of water, while about 80% of the world's population lives in close proximity to coasts or areas with significant water features, such as lakes and rivers. These statistics highlight the critical role that shipping plays in advancing the global economy. Even today, ships remain the primary mode of transportation of goods and goods around the world (UNCTAD, 2015).

Even today, maritime transport remains the bedrock of world trade and the global economy. To put it in perspective, 80% of all goods traded worldwide and 70% of their total value are transported by sea. In 2015, the global merchant fleet consisted of a staggering 89,464 vessels, with a combined tonnage of 1.75 billion tons (dwt), spread across more than 150 countries. This huge industry employs about a million people, who serve as crew members or work in shipping companies. It is worth noting that Greece maintains its position as a leading country in terms of merchant ships, followed by Japan, China, Germany and Singapore. (UNCTAD, 2015).

The next two figures illustrate the importance of shipping to global economic growth, showing the ratio of seaborne trade to world trade and global GDP (Gross Domestic Product), as well as the continued growth in the volume of goods transported by sea, which leads to the need for more merchant ships. Moreover, due to the continuously increasing efficiency of shipping as a means of transport, the prospects for further development of the industry will continue to be very strong (UNCTAD, 2016).

Today, economic activity depends on the mechanisms and rules of the world market, which attaches great importance to the concept of quality of goods and services as a means of dominating enterprises and industries in international increasing trade competition. Maritime transport, as an economic product of shipping, which, as mentioned, is an important factor in the global economy, it is important to constantly upgrade qualitatively, offering as much safety as possible for the goods and people they carry, as well as for the protection of the marine environment in which they operate. Next, the main problem for shipping, the marine casualty (UNCTAD, 2016), is analyzed.

2.1.2 Marine Casualty & Airworthiness

Considering the hazardous and ever-changing nature of the marine environment, which includes factors such as adverse weather conditions, tides, currents and piracy, it is imperative that the shipping industry adheres to strict standards of quality, safety and reliability. Merchant ships, operating in this challenging environment, face not only physical hazards but also potential risks related to human error, technical malfunctions and breakdowns.

Loss of life, economic disaster and widespread marine and coastal pollution are the possible outcomes of major maritime accidents caused by any or a combination of these factors. To ensure the reliability of shipping companies and the provision of top-notch services by them, it is vital to prioritise the management and prevention of maritime accidents, with a particular focus on maritime safety and environmental conservation.

The implementation has been good but actions must go further since the shipping function is so critical in the considered impending world and its needs are also ever-increasing. A marine casualty involves a variety of incidents on board a ship that may lead to actual or constructive total loss of the ship, loss of the cargo, and /or serious injuries to crew members or passengers or environmental damage due to the release of petroleum derivatives into the sea. The causes leading to a maritime accident are several and complicated. It must be emphasized here that the very decision to increase the dimensions of vessels so as to lower costs for carriage and to serve the economies of scale turns back to have a reverberating negative effect in the case of an accident. (Akten, 2006).

The main factors contributing to maritime accidents are, according to Akten (2006): Environmental factors such as strong winds, storms, limited visibility due to fog or rain, tidal waves, and currents among others. Technical malfunctions due to inadequate maintenance, damage to the engine or steering, and corrosion in the hull of the vessel among other factors.

The risks in marine environments are many, such being an increase in vessel traffic especially in sea straits, the presence of incompletely mapped areas, reefs and wrecks due to unreliable charts and inadequate maintenance of the reef network and signage system by coastal states.

The primary factor leading to accidents is human error, which stems from inadequate crew training and experience, as well as lack of knowledge or disregard of safety protocols and regulations. In addition, the way cargo is stored, either below deck or above, can also contribute to instability and potential accidents. It is important to note that accidents can result from a combination of these factors. For a ship to be considered of high quality, it is imperative that it

meets a fundamental requirement: maritime capability. A ship meeting the airworthiness criteria must possess the following characteristics, as described by Akten (2006):

1. Equipped with state-of-the-art technology, including radars, navigation systems, fire safety systems and other essential devices and machinery, to support its mission.
2. Adherence to all mandatory international safety regulations, such as the ISM Code and SOLAS.

It is important for ships to undergo proper maintenance and have access to a specialized workshop, which should be supported by their employer-owner. However, quality should not be limited only to the ship itself, but extended to the company as well. Even a state-of-the-art and well-equipped ship can pose significant risks if its airworthiness and overall quality are not effectively controlled and maintained by the shore management company through a robust safety management system. The consequences of operating an unseaworthy ship go beyond the possibility of accidents. They can also lead to a loss of credibility for both the ship owner and the management company, damaging their reputation. In addition, significant financial compensation can be claimed from insurance and ship-owning companies to cover costs related to environmental damage, injuries or deaths, destruction of goods and necessary repairs. (Akten, 2006).

Maritime accidents involve a wide range of incidents, varying in severity from minor damage and damage to the complete destruction of a ship and the lives of those on board. The following are the most significant maritime accidents, as identified by Akten (2006): The ships collided.

- A possible cause of stranding on the seabed is attributed to navigation errors.
- The explosion
- The fire was lit with intensity.
- Oil spills are a major concern when it comes to environmental disasters.
- The act of complete immersion
- There is a possibility of injury or death from the aforementioned accidents, as well as from negligence of the crew or inadequate training in the performance of their duties.

The U.S. Department of Commerce (1997) describes four main outcomes resulting from a marine casualty. The initial category includes pollution caused by oil spills, whether transported as a commodity or fuel. Regardless of the size of the spill, it not only has ecological impacts, but also significant economic impacts. These include costs related to cleaning and

restoring the marine environment, compensation of affected coastal areas, legal fees, penalties and fines, as well as damage to the reputation and credibility of the company. Loss of property belongs to the second category. Property and equipment may be destroyed or lost as a result of marine accidents.

2.1.3. The International Maritime Organisation (IMO)

Since shipping operates on a global scale, these regulations should have an international scope, encompassing all shipping companies and their ships, regardless of national affiliation. The International Maritime Organization (IMO) is the supreme authority, exerting significant influence over the entire maritime community, including states, shipowners, charterers, classification societies, insurance companies and others, through its policies, actions, rules and others. Regulations (IMO Facts and Figures, 2012).

Through the examination of literary sources, it becomes apparent that in the middle of the 19th century a series of world agreements concerning maritime matters were concluded. A notable example is the agreement signed in 1963 by 30 nations, which established uniform regulations for ships that meet each other at sea in order to avoid conflicts. However, the need for international standards governing maritime safety arose immediately after the tragic incident with the sinking of the Titanic in 1912. This led to the creation of the original international treaty on safety, known as the 'Treaty for the Safety of Life at Sea (SOLAS)', which has since been amended and renewed by the International Maritime Organization (IMO) and remains in force to this day (IMO Facts and Figures, 2012).

The International Maritime Organization (IMO), which was created by the United Nations in Geneva on 17 March 1948, and convened its inaugural session in 1959, is responsible for overseeing the SOLAS Treaty. Initially, the ISM Code was included in this treaty, which addresses critical issues such as the design, construction, equipment, stability, fire protection and loading of the ship, among other important safety-related aspects (IMO Facts and Figures, 2012).

As a specialized agency of the United Nations, IMO acts as a global authority for setting standards in order to ensure the safety and environmental sustainability of international shipping. Its primary objective is to develop a comprehensive regulatory framework that is globally recognized, fair and enforceable (IMO Facts and Figures, 2012). The IMO offices, currently located in London, consist of 171 Member States.

2.1.4. The Effectiveness of the Regulatory Framework in Shipping

More recently, in 2015, there was a significant decrease in ship losses, which amounted to a 45% decrease compared to the previous decade. This reduction offers hope for further reductions in the future. The graph below illustrates ship losses from 1985 to 2015, while also highlighting the role of the ISM code and ISO 9001 standard in contributing to the reduction of ship losses (Allianz, 2016).

It is important to highlight the significant reduction in oil spills at sea caused by accidents, human error or mechanical damage based on ship loss data. Over the past 45 years, there has been a drastic reduction in the amount of oil released into the sea. In the last 5 years alone, the average decrease was 92%, with the quantities of oil escaping falling from 24.5 thousand tons to 1.8 thousand tons (Allianz, 2016).

The shipping industry, with its inherent risks and risks, remains a key sector for global trade and the economy. The efficient and safe transport of goods and raw materials in large quantities is vital to meet the demands of the international market. Thus, the modern shipping industry prioritizes safety, efficiency and quality as its fundamental principles. Accidents not only lead to unintended consequences, but also disrupt international trade, negatively affecting the global economy. To ensure the highest standards, the 21st century maritime industry is subject to extensive regulation and oversight (Allianz, 2016).

Organizations such as ICS, INTERTANKO, INTERCARGO, BIMCO, OCIMF, SIGTTO, ITOPF, along with IMO and countries with merchant fleets, work together to enforce these regulations. In addition, classifiers (IACS), insurers (Lloyds, International Underwriting Association of London, IUMI, P&I Clubs) and international maritime non-governmental organizations (ICS, INTERTANKO, INTERCARGO, BIMCO, OCIMF, SIGTTO, ITOPF) play an important role in maintaining control, safety and environmental sustainability in the industry (Allianz, 2016).

As a result, the shipping industry is one of the most regulated, safe and environmentally friendly sectors worldwide. In order to comply with international regulations, there are currently 130 distinct certificates and records that must be maintained, which vary depending on the size and type of vessel. Among them, the most critical include: (Det Norske Veritas & Germanischer Lloyd, 2015):

- Required certificates related to the SOLAS Convention:
 - Passenger Ship Safety Certificate

- Cargo Ship Safety Certificate
- Cargo Ship Safety Construction Certificate
- Cargo Ship Safety Equipment Certificate
- Cargo Ship Safety Radio Certificate
- Cargo Ship Safety Radiotelegraphy Certificate
- Cargo Ship Safety Radiotelephony Certificate
- Minimum Safe manning document
- ISM document of compliance
- Safety management certificate (ISM code)
- Required certificates related to the MARPOL Treaty:
 - International Certificate of fitness for the carriage of dangerous chemicals in bulk
 - International Certificate of fitness for the carriage of liquefied gases in bulk
 - International oil pollution prevention certificate
 - International pollution prevention certificate for the carriage of noxious liquid substances in bulk (NLS certificate)
 - Dangerous good stowage plan
 - International Energy Efficiency Certificate
- Required certificates relating to other IMO conditions:
 - International tonnage certificate
 - Class certificate
 - International Load Line Certificate
 - Certificate of insurance and other financial security in respect of civil liability for oil pollution damage
 - Anti-Fouling Systems

In conclusion, with the treaties established by the International Maritime Organization (IMO), it has contributed to the effectiveness of quality in shipping both by reducing accidents and by limiting ecological disasters (Allianz, 2016).

2.1.5. Review of Articles

In this section there will be a presentation of scientific articles on ship inspections and the actions required by those directly involved in order to have a balance between maritime security and economic - operational interests. The methodology followed is based on the Literature Review. In order to obtain useful information for the elaboration of the thesis,

archives and studies of Greek and foreign bibliography, as well as official websites found on the internet were used. Safety Management and Control in Shipping. In the maritime sector, this chapter focuses on the techniques and strategies used for management and control. In recent decades, there have been notable transformations in regulations, influenced mainly by the emergence of the "new public management" paradigm (Power 2000). This change has deviated from the strict and exhaustive legislation that dictates the specific technical requirements that industries must meet.

In 2002, the shipping industry underwent a major transformation with the implementation of the International Safety Code (ISM Code). This change changed the approach from mere compliance to a system of self-regulation. As part of self-regulation, regulators, such as flag states, now require ship owners and companies to establish and maintain management systems that effectively adhere to public laws and regulations (Baldwin et al. 2010).

Inspections of ships should be carried out at least once every 12 months. To evaluate the vessel, an inspector will examine the vessel's documents, which may vary depending on the type of vessel. The surveyor will then carry out an inspection using the Offshore Vessel Inspection Questionnaire (OVIQ), which focuses on both the management system and the operational aspects of vessels (OCIMF 2010). OVIQ consists of fifteen modules (OCIMF 2011) that provide specific instructions to inspectors on what to check. Inspectors must answer all questions about OVIQ using one of four options: "Yes," "No," "Not Shown," or "Not Applicable." In addition, if further information is required, inspectors may provide handwritten text. Most questions about OVIQ are about regulatory requirements, but there are also inspection requirements of a more qualitative nature (Baldwin et al. 2010).

As part of the evaluation of the SMS, the inspector has the task of assessing both the applicability of the procedures and the user-friendliness of the procedure manuals. However, there is a lack of specific guidance on how to assess these factors. In addition, regarding charter verifications, most charterers require certification from "Achilles" in order for a company to be considered as a supplier. Achilles, an organization that verifies, certifies and monitors suppliers, includes various aspects of companies, such as corporate social responsibility, quality and health-safety (HSE) environment. In addition, charterers usually conduct their own assessment of their company to measure the effectiveness of quality and safety management systems. To achieve this, they use various standards and guidelines. One such standard is "NORSOK S-006", which is aligned with the International Maritime Organization (IMO) criteria for

evaluating HSE management systems (NORSOK 2003). Alternatively, some charterers use the "ISO 19011" guidelines, specially designed for control systems. Representing businesses in the field of offshore, marine and subsea engineering, the International Association of Maritime Contractors (IMCA) plays a vital role (IMCA 2013).

In addition, OVID strives to reduce the number of inspections by 17%, providing ship owners with the opportunity to demonstrate the excellence of their operations (OCIMF 2010). The primary objective of OVID is to enhance maritime safety and continuously improve it, with the ultimate goal of establishing OVID as the globally recognized ship safety assessment tool (OCIMF 2010). Typically, an OVID inspection is initiated by an OCIMF member to ensure the safety of an offshore service vessel (OSV).

2.2. INSTITUTIONAL FRAMEWORK

2.2.1 Historical development

Since the establishment of the new Greek state, in the 19th century, the interconnection of modern Greeks with the sea and ports has been evident. The need to regulate the legislative framework under which the country's ports operate arose very early. Already legislative acts related to the port system began to appear in 1865. In 1923, with the Legislative Decree on Ports and Port Works (Government Gazette A/181/4/7/1923), the foundations were laid for the institutional framework governing the operation of port management bodies, namely the Port Funds and the construction of port projects, the way of their financing and other regulations, abolishing any previous legislative regulations that existed.

The country already has 83 Port Funds. In 1939, a Royal Decree codified the provisions concerning the Port Funds, which are in force until today. In 1949, the first attempt was made to merge the Port Funds at Prefectural level, while in 1989 reforms began in the Port System in order to make their administration and management more effective. For the first time, the Municipal Port Fund is established with the transfer of port responsibilities to local government bodies.

In 1993, by Presidential Decree (P.D.390 - Government Gazette 165/A/27/9/1993) the second merger of Port Funds at Prefecture level after 1949 was decided. This decision creates 17 Port Funds at Prefecture level. In 1995, the Port Fund of the Prefecture of Ilia was split into the Port Fund of Katakolo and Kyllini with the Presidential Decree 135 (Government Gazette 81/A/5/5/1995) and the Port Fund of the Prefecture of Lesvos, into Lesvos and Limnos with the Presidential Decree 258 (Government Gazette 142/A/7/7/1995).

In 1999, with Law 2688 (Government Gazette 40A), the Piraeus Port Authority and the Thessaloniki Port Authority were converted into sociétés anonymes. Piraeus Port Authority was a Legal Entity of Public Law and was founded in 1930 by Law 4748 (Government Gazette 166A). Similarly, the Thessaloniki Port Authority was founded in 1953 by Legislative Decree 2551 (Government Gazette 229A). In 2001, with Law 2932 (Government Gazette 145A) for the conversion of Port Funds into Sociétés Anonymes, three Port Funds were split, the Prefecture of Magnesia, the Prefecture of Evros and the Prefecture of Kavala that had emerged respectively from the merger of the Port Funds of Volos-Skopelos, Alexandroupolis-Samothrace and Kavala-Thassos. By the same law (Law 2932/2001), the Legal Entities under Public Law under the name Port Fund of Alexandroupolis, Port Fund of Volos, Port Fund of Elefsina, Port Fund of Heraklion, Port Fund of Igoumenitsa, Port Fund of Kavala, Port Fund of Corfu Prefecture, Port Fund of Lavrion, Port Fund of Patras, Port Fund of Rafina were converted into sociétés anonymes under the names respectively "Port Authority of Alexandroupolis Société Anonyme", "Volos Port Authority Societe Anonyme", "Elefsina Port Authority Societe Anonyme", "Igoumenitsa Port Authority Societe Anonyme", "Heraklion Port Authority Societe Anonyme", "Kavala Port Authority, Société Anonyme", "Corfu Port Authority Societe Anonyme", "Lavrion Port Authority Societe Anonyme", "Patras Port Authority Societe Anonyme", "Rafina Port Authority Societe Anonyme". In 2006, with Law 3450 (Government Gazette 64A) the Port Fund of Samothrace merges with the Port Authority of Alexandroupolis S.A. (Pallis A., et al 2016).

2.2.2 Current institutional framework

According to the current institutional framework in Greece, 13 Port Authorities have been established and operate under various Laws and Presidential Decrees, 12 State Port Funds, 70 Municipal Port Funds and 2 Port Offices. Presidential Decrees define the responsibilities of these bodies (Pallis A., et al 2016).

There are also conflicting laws such as Law No. 3852 Government Gazette 87/A/7.6.2010 "New Architecture of Local Government and Decentralized Administration – Kallikratis Programme", according to which "Each municipality may establish or have: A legal entity governed by public law for the administration and management of a port area, in accordance with the applicable legislation..." i.e. it can establish a Municipal Port Fund, while Law No. 4150 Government Gazette 102/A/29.4.2013 "Reconstruction of the Ministry of Shipping and the Aegean and other provisions" in the context of the development of the National Port System article 38, institutionalizes the creation of Central Port Networks (article 39) and through

Article 42 "Port system development process 1. The Ministry of Shipping and the Aegean, following a reasoned proposal by RAL, invites the Municipal or Intermunicipal Port Funds to submit proposals in the framework of the formulation of the National Port Policy, in order either to merge with each other for the purpose of creating a Societe Anonyme – Regional Port Network or to join one of the Central Port Networks referred to in paragraph 3a of article 38 hereof". Simultaneously with article 51 of the same law, the Port Funds of the Prefecture of Evia were merged from a legal entity to a Port Authority S.A. (Pallis A., et al 2016)

However, in 2015 5 Municipal Port Funds were established and in 2016 the State Port Fund of Lesvos was transformed into a Municipal Fund. The above-mentioned Law (No. 3852 Government Gazette 87/A/7.6.2010) established the Port Regulatory Authority (RAL) as a regulatory body. The responsibilities of RAL are described in detail in Law No. 4389 Government Gazette / 94 / A / 27/5/2016, which established it as an Independent Authority, while the supervision of the Port System has the General Secretariat for Ports, Port Policy and Maritime Investments of the Ministry of Shipping and Island Policy (Pallis A., et al 2016)

Regarding Tourist Ports, in 1993 Law 2160/1993 (Government Gazette 118/A/19.7.1993) "Regulations for Tourism and other provisions", Chapter C "Creation and operation of tourist ports", articles 29 to 37, was issued, according to which the procedure for the siting, construction and operation of Tourist Ports is legislated. Law 2160/1993 was amended by the following laws: Law 2636/1998 (Government Gazette 198/A/27.8.1998), Law 4002/2011 (Government Gazette 180/A/22.8.2011), Law 4070/2012 (Government Gazette 82/A/10.4.2012), Law 4179/2013 (Government Gazette 175/A/8.8.2013), Law 4254/2014 (Government Gazette 85/A/7.4.2014), Law 4276/2014 (Government Gazette 155/A/30.7.2014), Law 4280/2014 (Government Gazette 159/A/ 8.8.2014). The main amendments of Law 2160/1993 can be found in Law 4070/2012 and Law 4179/2013. (Yantsi & Pardali, 2015).

Finally, as far as fishing ports are concerned, the only statutory body for the management of port facilities is OKAA SA (Central Market and Fisheries Organization) which manages the 11 auction halls belonging to the Ministry of Rural Development. For the proper implementation of the Common Fisheries Policy, there are circulars concerning fishing vessels which predetermine certain ports as to their use. In general, there is a lack of governance in the sector of the Ministry of Rural Development regarding Fishing Ports.

2.3. PORT STATE CONTROL

2.3.1 Introduction

Shipping is maybe the widest and internationalized industry, as its nature allows or requires the involvement and participation of the widest range of mentality, culture and practices. Its great advantage compared to the rest of the transport industry is, undoubtedly, the high transport capacity per route and therefore the low relative cost it offers to the charterer. Of key importance for the European Union is maritime transport, given its geography. More than 90% of EU external trade and 43% of interior are transported by sea: EU Member States are surrounded by water and have a long tradition of shipping. No other transportation sector moves goods between continents, which makes this the most international mode of transport.

Its more than one billion tonnes of cargo annually are loaded or unloaded in EU ports. One third of the world's maritime operations are directed by European Union nationals, and around 40% of EU trade goes to vessels controlled by EU interests. It comes as no surprise, therefore, that international fleet has been on continuous rise (with rare periods of downturn) since the end of World War II. The maritime transport sector — including shipbuilding, ports, fisheries and related industries and services — provides jobs for about 2.5 million people in European Union (Yantsi & Pardali, 2015).

No one can deny that European shipping plays a major role in the economic development process of all its members through increasing national production and enhancing the strategic position of the European Union and International Organizations in negotiations through added value. Each ship will be under one national system. The ship is said to be of that nationality, or fly that flag. The ship is registered at a port in the State whose flag the ship flies; this port is referred to as the registering port. According to general principles of international law, any State in which there is a system of ship registration is entitled to exercise technical and operational control over vessels flying its flag. The flag State shall have the right to take measures in respect of ships flying its flag for safety at sea with regard to the ship's construction and equipment, airworthiness, manning standards and working and living conditions on board, occupational safety and accident prevention measures and more. Ships flying its flag shall obey all international rules and laws and be fit to sail on the high seas and in all ports. This is done by the flag State through regular inspections conducted by inspectors empowered for that purpose on all ships. These inspections are known as “Flag Inspections” (Falk, 2016).

The International Maritime Organization member states agree most Flag States do not act in the manner of the international regulations because not all ships of it are being inspected or incomplete controls. This has pushed many countries to apply additional inspections to ships entering its ports before they set sail. It is known as Port State Control Inspections, and the number of States applying them is growing. Geographically-based countries created Regional Agreements, such as the Paris MOU, Tokyo MOU, Black Sea MOU etc., which specify the controls to be conducted and provide the appropriate instructions of its inspectors based on the aforementioned.

They have listings of every possible deficiency Inspectors might find on the ship and what they need to do. They make the results of inspections public so all ports and ship owners have the history of each ship. Only if it is truly necessary, in other words when a ship is not following the international rules, will they detain the ships but most of the time they go even further by prohibiting those ships that were detained more than once from all the ports of the Local Agreement.

2.3.2 General

2.3.2.1 International conventions

They are ideas, exchange of views and compromises. A convention normally comes out of an identified need. Often, it is something that comes as a follow-up to a proposed idea, and then subsequently recommended to a Commission or subcommittee of the IMO. As a result of the recommendations, the draft regulations are being prepared and a diplomatic conference initiated to revise, discuss, amend and finally adopt the resulting convention (IMO, 2020a).

The diplomatic conference bodies are normally conceived fairly sweeping in their potential application. These may in fact have an indirect applicability to non-contracting parties. Thus, all UN members, besides IMO members, are eligible to participate in these conferences. Involved non-governmental organisations attend. Attendance of the mentioned organisation is on a consultative basis because of its technical contribution. A conference will normally adopt a treaty, convention, protocol, or other type of agreement. All signatories to the document are bound by it.

Such authorization will be deemed to have been specifically agreed at the meeting. With a counterpart delegate indicating assent to the general principles within the draft treaty, a signatory can sign the document for his state— usually ‘subject to ratification, acceptance or approval’. After this confirmation is done by the national proper authority of the treaty, then

the act of signing by the representative becomes ratified (state will manifest their consent to be bound by the treaty) (IMO, 2020a).

A treaty or agreement is usually open for signature for some period. In many cases, 21,120 months. States not present at the diplomatic conference may become party to the treaty. Accession to an IMO Convention may be made by Any State even if it is not a member State party to the IMO Convention. Any State could make national laws giving effect to the provisions of an international maritime convention even though that State itself was not a party to the treaty. There has to be a set of conditions in each agreement stating how and when it will become effective. Those conditions are many and varied but normally the most important, most complex, and most stringent are the conditions of its entry into force. For example, SOLAS'74 stipulated that for entry into force, adoption by 25 States whose merchant fleets account for not less than 50% of the gross tonnage of the world. For the 1969 Tonnage Measurement Convention the requirement was adoption by 25 countries whose combined merchant fleets constitute not less than 65% of the world tonnage (IMO, 2020a).

2.3.2.2 National legislation

For Commonwealth countries to give effect to international conventions they have ratified, the provisions of the conventions must be incorporated into national law because international conventions are not self-executing. The methodology by which this is achieved depends upon the constitution of the particular state. Where this happens, a treaty becomes part of the national law automatically through ratification or adhesion. This law mostly expresses that treaties and conventions must be ratified by an official designated by the head of State for them to be ratified will automatically become part of the national law. In most cases, a state constitution will say that treaties and conventions that the head of the state wishes or wants the country to be a party to must be ratified by the legislature. This is pursued in situations where the obligations under the treaty will put in place sanctions or controls over the general population. (Lindroos, 2019)

The language used in the treaties is termed "treaty language," it lays down the obligations between States, but does not describe which individuals within those States are to be considered responsible for the obligations of the State. Implementation of State Parties' international obligations and active steps towards realization of human rights on the national level is ensured by the State. It has to ensure that its national law conforms to the Convention's provisions—the principle of "legal or legislative harmonization" (Lindroos, 2019).

2.3.2.3. Safety Regulation

Chapter I Regulation 19 of SOLAS 1974 states: "All foreign ships within the port of the other Contracting State shall be subject to control by authorized officials as long as such control is aimed at verifying the validity of the certificates issued under regulation 12 or 13. It states that these certificates shall be considered valid" unless there is evident cause to believe that the state of the ship or its equipment does not materially meet what is detailed in any of the certificates (Bastoulis, 2019).

For that purpose, "the officer carrying out the inspection shall take such measures as to ensure that the vessel does not sail until it can proceed to sea without danger to passengers or crew." Grounds for detaining the vessel may include evidence that the condition of the vessel and its equipment is not substantially as described in that certificate. But if such measures are taken the flag State (and IMO) has to be informed. Whether or not, efforts should be made by port authorities who must make every effort to avoid undue delay of the vessel (Bastoulis, 2019).

2.4. Port State Control (PSC)

2.4.1 Historical context

The start of international safety regulations for maritime operations was set in motion after the Titanic Conference on November 12, 1914. Various governments, whose nations prided themselves on thriving shipping industries, expressed the need for standardized guidelines on ship building. The creation of a common framework for certificates and regulations on maritime security and ship inspections were among the key outcomes of this conference. Unfortunately, due to the outbreak of war, the implementation of these agreements had to be delayed. However, the approval of SOLAS '29 (Safety of Life at Sea, 1929) paved the way for inspections of foreign ships in ports. Subsequently, these ship inspection regulations were amended and repeated at subsequent international conferences.

The provisions for legal control of port State as covered in SOLAS 74/78 Chapter I, "General Provisions," are found in IMO Resolution A.787(19). This shall be the first agreement by which the work of the Port State Control Officers (PSCO's) is based. In response to the ecological devastation caused by the Amoco Cadiz disaster, just off the British coast in March of 1978, a "Memorandum of Understanding" was signed in the Hague for the first time between the maritime European countries. This event propagated the needs of maritime safety to be reinforced. Initiated by these, further intensified the introduction of new and more stringent policies. The governments of Europe thus signed the "Paris Memorandum of Understanding

on Port State Control" to affirm an initiated control of various aspects within the maritime industry:

- Standards of safety of life at sea,
- standards of environmental pollution due to prevention and s
- tandards of living conditions to which they are all referred are.

The Port State Control (PSC) process involves the thorough examination of foreign ships in national ports to verify their compliance with international maritime conventions. This includes assessing the safety, construction, management and equipment of the vessel, as well as ensuring that it operates in accordance with applicable national legislation. PSC comes into play when ship owners, registrants and flag State administrations fail to meet the requirements set out in these conventions. While ultimate responsibility lies with flag states, port authorities have the authority to inspect foreign ships in their ports to address any deficiencies before granting permission to sail. Port State control shall operate in conjunction with flag State control to ensure maritime security. Recently, the importance of the PSC has gained widespread recognition, leading to collective efforts in various regions to establish a unified approach to its effective implementation.

2.4.2 The international context

The general rights and responsibilities of the flag State are defined by the United Nations Convention on the Law of the Sea, 1982 (UNCLOS). Two specialised agencies at the United Nations, namely the International Maritime Organization (IMO) and the International Labour Organization (ILO), are tasked with developing and revising conventions and directives governing ship compliance. The IMO focuses mainly on issues related to maritime safety, pollution prevention and training of seafarers, while the ILO addresses issues related to living and working conditions on board. While the IMO and the ILO establish the global regulatory framework for ships, it is the responsibility of each Member State to enforce the international conventions it has ratified for ships flying its flag.

The primary foundation for safety, pollution prevention and training regulations are the international conventions established by the IMO. In addition to these conventions, there are other important regulations such as the SOLAS, MARPOL, STCW, Load Lines and Cargo Capacity Conventions. Complementing these regulations are the guidelines provided by the Connoisseurs, which mainly focus on the structure of the vessel, which includes the

construction materials, chassis dimensions and critical mechanical systems of the main engine. The mandates described by the Experts and international conventions can be harmonized.

2.4.3 Rights of port authorities

State jurisdictions apply in a manner that brings out such distinct and special rights enjoyed by Coastal States against every other foreign vessel stepping into their exclusive economic zone, extending above 200 miles. Such privileges are mostly connected with fishing activities and measures taken to prevent marine pollution. For this part of the High Seas, the coastal State has specified rights to explore, exploit, conserve, and manage living and non-living resources found on the surface and beneath the seabed. In cases where it is a vessel under the guidance of another State, jurisdiction concerning the flag State has to correspond with that provided by Coastal or Port State authorities. By general rules constituting internationally accepted laws governing vessel operations on the world's oceans and seas (also known as customary international maritime law), a State has some form of jurisdiction to exercise control over foreign-flagged vessels within its territories.

In the case that it is a threat to the marine environment and its protection, a Coastal State is entitled to act against a vessel's activities according to UNCLOS. Such intervention, however, should be in respect of the rights and obligations of other states. In addition to territorial jurisdiction, states are enabled by conventions set forth by the IMO and ILO to carry out PSC inspections on foreign ships in their ports. Primary responsibility for a vessel's maintenance of law and order, discipline on board, proper navigation, safety of the vessel and persons and avoidance of pollution rests with the flag State. The flag State shall ensure that a vessel is provided, equipped, operated and maintained in conformity with the laws and regulations of the State whose flag it flies.

Port State (PSC) control of foreign merchant ships within internal waters is a generally recognized principle. Two arguments by states justified putting forth PSC measures. 1) It ensured safety for its citizens and environment by allowing self-defense from submarine vessels. 2) It complied with international agreements of maritime safety by not allowing unseaworthy ships to begin their voyages.

While UNCLOS has provided a rationale for PSC's actions, it has sought to confine the powers of PSC with foreign ships and has put in place specific protocols. Jurisdiction granted under UNCLOS to port states is limited, concerning only the conservation of the marine

environment and enforcement of specified safety regulations as spelt out in various conventions by IMO and ILO.

At the beginning, PSC had confined itself to checking only the technical aspects under IMO conventions. But revisions incorporated into SOLAS '74 empower PSC officers to check operational requirements "when there are clear reasons to believe that the captain or crew is not familiar with essential deck procedures regarding the safety of the vessel." Similar Amendments Incorporating In MARPOL 73/78 and STCW 1978, Amended In 1995.

The primary objective of PSC inspections is to guarantee that foreign ships are free from potential pollution hazards while ensuring a safe and healthy working environment and compliance with applicable international treaties. It is important to note that, in most cases, inspections should not unduly impede the vessel's progress. Furthermore, it is imperative that the selection of vessels for inspection be carried out without any form of discrimination and instead follow a consistent and uniform approach. This applies not only to ships registered under the flag of their own country, but also to ships flying the flag of states that have not ratified the convention. Consequently, there will be no preferential treatment. In addition, a State has the power to enact domestic legislation and impose additional regulations on foreign vessels entering its waters. For example, the United States has implemented the Oil Pollution Act of 1990 (OPA 90).

2.4.4 Selection of vessels of inspection

Local port authorities understand that carrying out inspections on every foreign vessel entering their ports would not be cost-effective or necessary, since not all ships are in below average condition. To optimise efficiency, port authorities use a system of general inspection rates, ensuring that a minimum number of vessels are inspected. In addition, an assessment system is used to identify and inspect vessels that are more likely to be inferior.

Each Memorandum of Understanding (MOU) independently selects ships for inspection using a scoring system, ensuring that any vessels that may not meet the standards are identified in advance. In addition, specific vessels of a certain age and type are selected for thorough inspections and targeted inspection campaigns are carried out to address specific issues and areas of concern for vessels.

According to the statutes, it is mandatory for each vessel to undergo an inspection every six months. Inspection rates differ for local agreements, with the aim of ensuring a sufficient number of inspections for several foreign ships per year. Due to variations in the number of

inspectors in different ports or states, the inspection rate may vary within the same MoU. However, an overall annual inspection rate is set for the entire area. For example, the Protocol to the Paris Convention sets an annual foreign flag inspection rate of 25%.

2.4.5 Databases

In order to facilitate the identification of suitable vessels for inspection, the Paris and Tokyo MoU oversee the cooperation between SIRENAC and APCIS, using databases to collect the necessary information. These databases offer access to port arrival lists, shipping schedules, vessel position reports, and previous reports from inspectors. In addition, there are global databases that provide comprehensive inspection data from various regions. In 2000, the European Commission and maritime services from France, Japan, Singapore, Spain, England and the USA established EQUASIS.

The mere consideration of figures when selecting vessels to be inspected inevitably fails to distinguish between those in good condition and those in need of inspection. Port authorities are now actively considering implementing an assessment system that takes into account a vessel's inspection history. Therefore, vessels with higher ratings will have priority for inspection over those with lower performance. This approach will facilitate the achievement of predetermined inspection rates for each site and enhance the overall effectiveness of inspections.

2.4.6 Reception facilities and port vessels

It is imperative for coastal states to establish the appropriate infrastructure in their ports to accommodate the disposal of various types of garbage from ships, including oil waste, chemical residues, sewage and garbage. As part of the MARPOL agreement, all parties involved must take responsibility for ensuring that proper facilities are in place to receive oil residues and mixtures at locations such as oil loading terminals and repair ports.

In a paradoxical reversal, it is the very countries that have expressed concerns about marine pollution in their waters that have neglected to set up adequate reception facilities in their ports, particularly in developing countries where financial resources are limited. The MARPOL Directives do not impose any obligation on these governments to provide such facilities, nor do they stipulate that they should be offered at no cost if available. This situation is further aggravated by the fact that numerous oil loading stations are located in these developing countries, exacerbating the problem.

The International Maritime Organization (IMO) has issued comprehensive guidelines outlining the necessary measures to ensure the availability of adequate port reception facilities. These guidelines offer practical solutions to deal with different types of waste substances without burdening vessel operators with excessive costs. Neglecting the provision of these basic facilities forces ships to either store their waste on board indefinitely, divert them to ports with reception capacity (incurring additional costs) or engage in illegal disposal practices at sea, thus exposing themselves to potentially significant penalties.

Port Authority ships, including tugboats, experimental vessels, warehouse barges and hydrographic vessels, are obliged to comply with both national laws and international conventions, in particular regulations to avoid collisions at sea, while operating within port. It is important that instructions given by vessel traffic services, port authorities or pilots are provided in a clear, concise and precise manner, ensuring that the receiving vessel fully understands and follows the orders given.

According to international legal principles, each nation has the authority to regulate foreign ships in its ports. However, this right is not unlimited and is subject to the concurrent jurisdiction of the flag State. Each country has separate rights, obligations and responsibilities in this regard. The flag State, in particular, has full and exclusive jurisdiction over ships operating in international waters and is obliged to exercise diligently control and authority over administrative, technical and social aspects relating to ships flying its flag.

In order to comply with the regulations, flag states are required to create a comprehensive list that includes the names and specific information of all vessels under their jurisdiction. It is the responsibility of flag States to implement appropriate actions to ensure compliance with this requirement.

- (a) The construction, equipment and ability of ships to sail the seas.
- (b) The staffing of vessels, the conditions under which crews work and the training they receive.
- (c) The effective use of signals, the continuous maintenance of communication systems and the preventive avoidance of conflicts.

2.5. Memoranda of Understanding & Regional Port State Control Agreements

2.5.1. Paris MoU

The Hague Memorandum was developed in 1978 and involved several Maritime Authorities from Western Europe. Its primary focus was to ensure the implementation of appropriate living and working conditions on board ships, harmonized with the standards outlined in the International Labour Organization Convention (ILO Convention) (Paris Memorandum, 2018).

The incident with the ship Amoco Cadiz caused a significant outcry from both the public and politicians in Europe, leading to a demand for stricter regulations on maritime safety. In response to this pressure, a comprehensive memorandum, known as the Paris Memorandum in 2018, was developed that aimed to address these concerns.

The three main areas of focus in the maritime industry are ensuring the safety of life at sea, preventing pollution from ships and improving living and working conditions on board. In January 1982, a ministerial conference was held in Paris, France, where fourteen European countries signed a new Memorandum of Understanding (Paris Memorandum) on Port State Control (PSC). This agreement was formally approved on July 1, 1982 (Paris MoU, 2018).

Since its inception, the Paris MoU has undergone multiple amendments to incorporate the evolving safety and environmental protection requirements set by the International Maritime Organization (IMO) and the relevant regulations regarding the welfare of seafarers in their working and living conditions (Paris MoU, 2018).

2.5.2. Tokyo MoU

In December 1993, the Memorandum of Understanding on Port State Control (PSC) in the Asia-Pacific region, better known as the Tokyo Memorandum, was finalised in Tokyo. This agreement includes 20 maritime authorities from the Asia-Pacific region (Tokyo MoU, 2018). The Tokyo Memorandum entered into force in 2004, with the aim of creating a standardized system for inspecting ships and ensuring that foreign-flagged vessels operating in the Asia-Pacific region adhere to the same standards as merchant ships. Every year, Tokyo ports carry out over 20,000 inspections on foreign ships, guarantee compliance with international safety and environmental regulations, as well as provide satisfactory living and working conditions for crew members (Tokyo MoU, 2018).

When ship owners, recognised organisations and flag state administrations fail to comply with the regulations set out in the International Maritime Conventions, port state

control (PSC) comes into play. Although the primary responsibility for enforcing these Conventions lies with flag States, port States have the authority to carry out inspections on foreign ships entering their ports. The purpose of these inspections is to verify that any identified deficiencies have been resolved before the ship's departure. Port State control is seen as a complementary mechanism for flag State control, as stated in the 2018 Tokyo Memorandum of Understanding.

The primary objective of the Tokyo Memorandum is to promote a robust port state control system in the Asia-Pacific region by encouraging member cooperation and coordinating efforts to eliminate rudimentary shipping. This initiative aims to enhance maritime safety, protect the marine environment and ensure the well-being of seafarers in their working and living conditions (Tokyo MoU, 2018).

The organizational structure of the Tokyo MoU consists of the following principles (Tokyo MoU, 2018):

- Members: Australia, Chile, China, Fiji, Hong Kong (China), Indonesia, Japan, Republic of Korea, Malaysia, Marshall Islands, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Thailand, Vanuatu, Vietnam.
- Associate members: Panama
- Responsible observers: Republic of Korea, Macao (China), Solomon Islands, Kingdom of Tonga and United States Coast Guard.
- Observer organisations: International Maritime Organisation (IMO), International Labour Organisation (ILO), Paris MoU, Acuerdo Vina del Mar MoU, Indian Ocean MoU, Black Sea MoU and Riyadh MoU.
- Tokyo MoU on Port State Control.

In order to facilitate the objectives outlined in the Memorandum, a Port State Control Committee shall be established, composed of representatives from all Member States. The Commission welcomes the participation of representatives from cooperating authorities, who are invited to contribute to its activities without voting rights. This arrangement is in line with the Commission's guidelines (Tokyo MoU, 2018).

The tasks assigned in the memorandum are performed by the entity, diligently promoting the harmonisation of inspection, correction and detention procedures and practices through various methods such as training and seminars. In addition, the entity is responsible for

developing and updating the inspection guidelines in accordance with the provisions of the Memorandum.

The establishment of the Tokyo Memorandum Secretariat in Tokyo, Japan, on March 15, 1994, is in line with the provisions outlined in the MoU. The Secretariat is responsible for developing and evaluating protocols for information exchange, as well as addressing various operational and efficiency issues related to the MoU (Tokyo MoU, 2018).

The main responsibilities of the Port State Control Committee include serving at various meetings, organising training courses and seminars for Inspectors, conducting audit data research and analysis, collecting and exchanging information on inspectors with participating authorities, and providing technical assistance. The Tokyo Memorandum Code of Good Practice serves as a guideline for maintaining integrity, professionalism, and transparency within the organization. This document describes the expected actions and behavior of inspectors during inspections and stresses the importance of using professional judgment when performing their duties. (Tokyo MoU, 2018).

2.5.3. Acuerdo Vina Del Mar MoU

Despite technological advances, maritime accidents still occur and produce significant loss of property, life and damage to the marine environment, for reasons such as (Acuerdo Vina Del Mar MoU, 2018):

- Improper maintenance of material and equipment
- Growing shortage of experienced crew
- Non-compliance with international safety standards
- The current situation forces some vessels to operate under inadequate conditions.

Due to their failure to meet the necessary standards set by international conventions, these ships pose a significant threat to both maritime safety and the marine environment. To address the issue of ships without electricity, port states have taken the initiative to strengthen their surveillance and regional agreements. To pursue this goal, the Maritime Authorities of the region gave their approval to the Latin American Agreement (Acuerdo Vina Del Mar MoU, 2018).

At the 6th Meeting of the Regional Cooperation Operational Network between Maritime Authorities from South America, Cuba, Mexico and Panama (ROCRAM) on 5

November 1992, the Latin American Agreement (Vina del Mar MoU) on Port State Control (PSC) was adopted. The agreement was originally signed by Argentina, Brazil, Colombia, Chile, Ecuador, Mexico, Panama, Peru, Uruguay and Venezuela (Acuerdo Vina Del Mar MoU, 2018). Currently, the Latin American Agreement (Vina del Mar MoU) consists of the following members (Acuerdo Vina Del Mar MoU, 2018):

- Argentina
- Brazil
- Chile
- Colombia
- Cuba
- Ecuador
- Guatemala
- Honduras
- Mexico
- Panama
- Peru
- Dominican Republic
- Uruguay
- Venezuela

The global recognition of the Vina del Mar Memorandum of Understanding, also known as the Vina del Mar Memorandum of Understanding, is of significant importance as it serves as the foundation for enhanced cooperation between maritime authorities. This cooperation aims at the effective coordination of surveillance measures for foreign ships calling at ports in the region, aligning with the requirements outlined in the international treaties on maritime safety, training and certification of crew members, and prevention of pollution from ships (Acuerdo Vina Del Mar MoU, 2018). The fundamental essence and objective of the Vina del Mar Memorandum of Understanding revolves around the commitment of maritime authorities in the region to establish and maintain a robust control system. This system ensures that all foreign ships visiting their ports comply with the regulations established by international conventions. The structure of the Memorandum of Understanding of Vina del Mar mainly revolves around two main entities (Acuerdo Vina Del Mar MoU, 2018).

The main objectives of the Vina del Mar Memorandum of Understanding include the Agreement Committee and the Agreement Secretariat, which includes the Information Centre (CIALA).

Every year, the Maritime Authorities carry out inspections on at least 20% of the ships that sail to the ports of the region. Unless there are shortages or the ship is carrying dangerous cargo, the inspection of the ship (excluding passenger and cargo ships in bulk) is not required within the same six-month period.

To ensure fairness and accuracy, uniform instructions are provided to all participants, without any differentiation based on the flags displayed on their vessels. The inspection process is carried out by authorized personnel deemed qualified by the Shipping Authority. The visit begins with a thorough examination of the following documents (Acuerdo Vina Del Mar MoU, 2018):

- Ship security certificates and documentation
- Calendars
- Minimum security document for compensation
- Certificates of crew competency
- A general inspection is carried out to determine the condition of the vessel
- If the vessel does not carry the certificates or if there is clear evidence, a more detailed inspection shall be carried out.

Should the ship's deficiencies endanger safety or the marine ecosystem, the ship will be detained and the captain will have to address these deficiencies before being granted permission to sail. In addition, the flag state of the ship will provide information on the actions taken (Acuerdo Vina Del Mar MoU, 2018).

The primary objective of this Agreement is to support PSCOs in conducting their audits with the utmost professionalism. Inspectors play a critical role in port state oversight and are essential to achieve the objectives set by the Vina del Mar Memorandum of Understanding. Acting as the main point of contact between the Vina del Mar MoU and the shipping and port industry, the Inspector maintains regular communication (Acuerdo Vina Del Mar MoU, 2018).

The actions of Auditors are evaluated and evaluated against three fundamental principles outlined in the Code of Practice: integrity, professionalism and transparency. These principles, as defined in Acuerdo Vina Del Mar MoU (2018), are as follows:

Integrity includes moral wholeness and stability, along with the absence of harmful motives or influences. Meanwhile, professionalism implies the effective implementation of globally recognized codes of conduct and expertise in a particular field. In the case of the Inspectors, their conduct is regulated by the competent maritime authority, which is widely accepted and accepted by other maritime authorities that are party to the Agreement.

The Vina del Mar Memorandum of Understanding does not grant the Inspector any exemption from compliance with the regulations described in international conventions and relevant national legislation. Transparency, which includes honesty and accountability for one's actions, is a fundamental principle. (Acuerdo Vina Del Mar MoU, 2018).

Each year, an annual report is published presenting statistics derived from inspections carried out throughout the year. These statistics include various aspects such as bookings, shortages, ship types, age, flag, and more (Acuerdo Vina Del Mar MoU, 2018).

2.5.4. Indian Ocean MoU

During a comprehensive assessment of the adequacy of regional maritime safety infrastructure and compliance with International Maritime Organization (IMO) regulations between August and September 1997, the concept of the Indian Ocean MoU was introduced. This initiative was established to promote regional cooperation among Indian Ocean countries with the aim of regulating ship operations within the region (Indian Ocean Memorandum, 2018).

In October 1997, the initial preparatory gathering took place in Mumbai, India, on the orders of the IMO Secretary General, following the kind invitation extended by the Government of India to host the meeting (Indian Ocean MoU, 2018). The second preparatory and signature meeting was then held in Pretoria, South Africa, from 1 to 5 June 1998, under the auspices of the South African government. At this meeting, the Memorandum was formulated and finally finalized.

Representatives from several countries, including Djibouti, Eritrea, Ethiopia, India, Iran, Kenya, Maldives, Mauritius, Mozambique, Seychelles, South Africa, Sri Lanka, Sudan, Tanzania and Yemen signed the Memorandum of Understanding on Port State Control for the Indian Ocean (Indian Ocean Memorandum, 2018). The signing took place at the Secretariat's headquarters in Goa, India, from 5 June 1998 to 22 January 1999. Australia, Sudan, Tanzania, India, Eritrea and South Africa signed the MoU, followed by Mauritius, Sri Lanka, Iran, Kenya, Maldives, Oman, Yemen, Bangladesh, Comoros and Mozambique. By September 2013, the

number of member countries had reached 17. The MoU entered into force on 1 April 1999 (Indian Ocean Memorandum, 2018).

At the inaugural meeting of the Indian Ocean Memorandum, the Commission reached a consensus on the inaugural year's work programme, which includes the preparation of a handbook for Port State Control Inspectors, the dissemination of comprehensive information on training courses for port State inspectors, the adoption of the Tokyo MOU approach to information system assistance, the regular publication of inspection statistics on a monthly basis, the publication of a quarterly newsletter to inform members of the latest developments and the issuance of an annual report after the second meeting of the Committee.

The headquarters of the Indian Ocean Memorandum of Cooperation (Indian Ocean Memorandum of Understanding) is located in India. The Secretariat, managed by the Indian Ocean MOU State Committee, oversees the monitoring process. It actively participates in the meetings of the Commission and provides support to its various efforts (Indian Ocean Memorandum, 2018). In an effort to enhance transparency regarding the operations of the Indian Ocean Memorandum of Understanding, the Port State Control Commission has taken the decision to publish public control data on its official website (Indian Ocean MoU, 2018).

2.5.5. Caribbean MoU

The Memorandum of Understanding on the Status of Port State Control in the Caribbean Region (Caribbean MoU) was signed at the Church of Christ, Barbados on 9 February 1996 by nine states (Caribbean MoU, 2018):

- Antigua
- Barbados
- Santo Domingo
- Grenada
- Guyana
- Jamaica
- French Guiana Netherlands Antilles
- Suriname
- Trinidad
- Tobago

This was in fact the culmination of years of discussion, research and assistance by the International Maritime Organisation (IMO). The membership has since grown to seventeen Member States, which are as follows (Caribbean MoU, 2018):

- Antigua
- Aruba
- Bahamas
- Barbados
- Belize
- Cayman Islands
- Cuba
- Curaçao
- Grenada
- Guyana
- Jamaica
- Netherlands Antilles
- Saint Kitts
- Nevis
- Suriname
- Trinidad
- Tobago

Participation in the Caribbean Memorandum was extended in 2015 as France and Saint Vincent joined as full member states. There have been ongoing discussions with Sint Maarten, Saint Lucia and the British Virgin Islands about their possible participation. As part of their commitment, Member States agree to inspect 15% of international ships entering their ports. Due to the unique features of the area, there are many unconventional ferries. To address this, the Cargo Ship Safety (CCSS) and the Small Merchant Vessel Safety (SCV) Code (Caribbean MoU, 2018) were introduced.

The Memorandum on the Caribbean operates under the guidance of the Authorities mentioned in the MoU, with the primary objective of enforcing international conventions and standards for ships (Caribbean MoU, 2018):

- The safety of life at sea

- Security
- The prevention of marine pollution and
- Working and living conditions on board ships

The original formation of the Caribbean MoU consisted of:

- The Paris MoU outlining most guiding principles
- The United States Coast Guard who assisted the region in terms of training for Port State inspections and other training initiatives.
- Lloyd's Registry Fairplay which worked on the Carib Ship Data Base.

The creation of the Caribbean Memorandum has been widely recognized as a driving force behind the progress and development of maritime administrations in the Caribbean region. As a result, Member States are now required to have a stable framework for their maritime administrations when carrying out port State control. In addition, cooperation has been established with the IMO and the Port State Control Committee to ensure that Member States become parties to the International Maritime Conventions (Caribbean MoU, 2018).

The administrative and operational part of the Caribbean Memorandum is known as the Secretariat. Under the conditions outlined in the Memorandum of Understanding, the Secretariat operates independently even though it is located within the Member State. The host country is therefore responsible for concluding the Caribbean Memorandum. Since 2002, the Secretariat has been located in Kingston, Jamaica, having initially been based in Barbados (Caribbean Memorandum, 2018).

The primary objective of the Secretariat is to oversee the operational tasks of the Caribbean Memorandum of Cooperation on a day-to-day basis. It acts as a central communication hub and facilitates the exchange of information between parliamentarians, observers, the International Maritime Organisation (IMO), other port state regimes and associated organisations. The Secretariat is responsible for coordinating all meetings, workshops and seminars. Funding for the activities of the Secretariat comes exclusively from Member States' contributions (Caribbean MoU, 2018).

The participation of observer states in the network of Caribbean Memoranda of Cooperation is of great value, as they actively participate in meetings and provide valuable insights during discussions. Observer States associated with the Caribbean MOU include

Anguilla, Bermuda, the British Virgin Islands, Santo Domingo, France, Saint Lucia, and Saint Vincent and Caicos (Caribbean MoU, 2018).

The Caribbean MoU Observer Organizations are the following (Caribbean MoU, 2018):

- International Maritime Organization (IMO)
- International Labour Organization (ILC)
- Paris MoU
- United States Coast Guard (USCG)
- IHS Fairplay
- Lloyd's Register (North America)

In Paramaribo, Suriname, a computerized information system was implemented in 2005. Its purpose was to document and archive the results of port state inspections, as well as to facilitate the exchange of information within the region. This system plays a crucial role in reporting port State inspection findings and disseminating information to Member States and other cooperating organisations. With its range of features, this innovative system offers a wealth of practical tools that significantly assist Inspectors in the performance of their responsibilities (Caribbean MoU, 2018).

2.5.6. Black Sea MoU

The Black Sea MoU is a system of harmonised inspection procedures designed to target foreign ships that do not operate to standards. Black Sea MoU was founded on April 7, 2000, with the following members (Black Sea MoU, 2018):

- Bulgaria
- Georgia
- Romania
- Russia
- Turkey
- Ukraine

Responsibility for Port State Control (PSC) lies with the Maritime Authority and is carried out by competent Port State Inspectors (PSCOs). The Black Sea MoU focuses on ports located along the Black Sea coastline. The executive body of the Black Sea Memorandum is the Port State Control Commission, which handles policy, funding and administration issues.

The Permanent Secretariat located in Istanbul; Turkey (Black Sea Memorandum, 2018) assists in the day-to-day operations of the Black Sea MoU.

The first step in examining the vessel involves confirming the validity of certificates and documents. If deficiencies are found or if the ship does not comply with regulations, a more thorough inspection shall be carried out. Port State control strictly enforces internationally recognised conventions, referred to as 'relevant instruments'. It is important to note that flag States that are not parties to these Conventions do not receive preferential treatment. In cases where significant deficiencies are identified, the ship is detained and the captain is instructed to correct the issues before departure (Black Sea Memorandum, 2018).

In the context of the implementation of the Memorandum, checks are carried out by the Authorities. These inspections shall include a visit to the ship and verification of the certificates and documents referred to in the manual. In addition, they shall ensure that the crew and the overall condition of the ship, including equipment, engine rooms, accommodation and hygiene on board, comply with the provisions of the relevant Acts (Black Sea Memorandum, 2018). If valid certificates are not available or if there are clear indications that the crew or the condition of the ship or its equipment do not meet the requirements, or if the master or crew is not familiar with ship safety or pollution prevention, a more detailed inspection shall be carried out. Take place. Authorities ensure that the master of the ship receives an inspection report during the inspection, which provides the results of the inspection and describes the necessary measures to be taken (Black Sea Memorandum, 2018).

If there are deficiencies that pose a clear threat to safety, health or the environment, the Administration shall have the power to detain the ship or cease its activities. The detention or suspension order of the vessel will be lifted as soon as the risk has been eliminated. If the deficiencies leading to the departure cannot be rectified in the port of inspection, the Administration may authorise the ship to proceed to a designated port or accessible shipyard. Alternatively, if the issues concern defects as described in MLC 2006, the ship may be allowed to proceed to the port specified in the Corrected Correction Action Plan (Black Sea MoU, 2018).

Ships within the information system are categorized into three risk levels: high, basic or low. This classification is determined by the assessment of general and historical factors. High risk vessels (HRS) are those that meet the criteria and receive an overall score of 5. Low risk vessels (LRS) are ships that meet all LRS parameters and have undergone at least one

inspection in the last 36 months. Basic risk vessels (SRS) are neither LRS nor HRS ships, as defined by the Black Sea MOU in 2018. The Administration shall have discretion to determine whether additional inspection is required where certain unforeseen elements emerge that may pose a significant risk to the ship, crew or the environment. These factors include: (Black Sea MoU, 2018):

- Reports on ships not fulfilling requirements
- Ships reported with outstanding deficiencies
- Ferries booked more than 3 months in advance
- Ships which had been the subject of a report or complaint by the master, seafarer or any person or body acting on behalf of entities responsible for the safe operation of ships, and for decent living and working conditions on board of ships, provided that such a report or complaint is not, according to the judgement of the member State concerned, clearly unfounded.
- Ships operated in a manner that is non-compliant
- Ships reported with cargo problems (particularly harmful or noxious)
- Ships where, following advice from a primary information source, it has been found that the risk level is different from that recorded so increases
- Ships carrying certificates issued by a former MOU.

2.5.7. Riyadh MoU

In June 2004, the Riyadh MoU was signed by six countries (Riyadh MoU, 2018):

- Bahrain
- Kuwait
- Oman
- Qatar
- Saudi Arabia
- United Arab Emirates

The objective of the Riyadh Memorandum of Understanding (Riyadh Memorandum of Understanding) is to establish safe and efficient maritime transport in the Gulf region. As part of International Maritime Organization (IMO) initiatives, the Riyadh Memorandum is one of several agreements signed by maritime authorities to ensure port state control (PSC) in specific areas. The PSC includes the regulation of foreign ships in national ports, ensuring compliance

with international regulations, proper ship maintenance, and compliance with the standards outlined in the Memorandum (Riyadh Memorandum, 2018).

The maritime authorities of the six Gulf states (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates) have concluded an agreement known as the Riyadh Memorandum of Understanding (Riyadh Memorandum of Understanding). This agreement establishes a single system of port State control measures and strengthens cooperation and exchange of information on matters relating to port State control. Since its launch in 2004, Member States have actively supported the Riyadh Memorandum of Understanding and worked diligently to improve inspection standards. Port State control is of great importance to the competent authorities of the members of the Riyadh Memorandum, given the region's dependence on maritime trade and its sensitivity. As a result, the authorities of the Riyadh Memorandum allocate significant resources to create a robust port state control program (Riyadh MoU, 2018).

The Secretariats of the Riyadh MoU were established in Oman in June 2005 pursuant to the MoU's provisions. The Secretariat has the following major functions (Riyadh MoU, 2018):

- to prepare meetings when necessary
- organizes training courses and seminars by Inspectors
- assisting in providing technical assistance to the members of the Memorandum.

2.5.8. Abuja MoU

One of the nine regional Memoranda of Understanding (MoUs) is the Abuja MoU, which covers the West and Central Africa region. Created on November 22, 1999, the Abuja MoU is an intergovernmental organization that includes the maritime administrations of countries located along Africa's Atlantic coast. The Member States of the Abuja Memorandum of Understanding are: (Abuja MoU, 2018):

- Angola
- Benin
- Côte d'Ivoire
- Gabon
- Ghana
- Nigeria

- Congo
- Guinea
- São Tomé
- Príncipe
- Senegal
- Sierra Leone
- South Africa
- Gambia
- Togo

The Memorandum of Understanding, as outlined in the 2018 Abuja Memorandum, focuses on identifying vessels for inspection based on the following criteria: ships making their initial visit or returning to ports of a State whose Administration has signed the Memorandum after a pause of twelve months or longer; and ships authorised to leave the port of a State whose Administration is a party to the MoU; provided that any deficiencies identified are corrected within a defined timeframe.

- Ships that have been deemed inadequate by port authorities due to the potential risk they pose to safe navigation.
- Vessels that have not received the necessary legal certificates for their construction and equipment as defined by the applicable legislation.
- Ships carrying hazardous or environmentally harmful substances without proper documentation, as well as ships temporarily deprived of their safety certification.

2.5.9. Mediterranean MoU

In order to enhance maritime safety, preserve the marine ecosystem and improve quality of life and working conditions on board ships, the Maritime Authorities of Algeria, Cyprus, Egypt, Israel, Lebanon, Malta, Morocco, Tunisia, Turkey and Palestine recognised the need for collective action. Consequently, these countries united on 11 July 1997 to conclude the Mediterranean MoU. The current participants in this Memorandum of Understanding include the following nations: (Mediterranean MoU, 2018):

- Algeria
- Cyprus

- Egypt
- Israel
- Jordan
- Lebanon
- Malta
- Morocco
- Tunisia
- Bulgaria
- Turkey

Based on the principles of effective and coordinated port State control in the area, all Member States have made the following commitments. The commitments outlined by the 2018 Mediterranean Memorandum specifically state that State Control of the port must:

- It is imperative to implement all meaningful actions for the certification of instruments related to the objectives outlined in the MoU.
- A robust monitoring system must be maintained to guarantee that foreign merchant ships, regardless of their flag, comply with relevant regulations when visiting ports within the state.

Within three years of the implementation of the Memorandum, inspections are required on an annual basis for approximately 15% of the planned total of foreign merchant ships calling at the ports of the state. The procedures for these inspections reflect those outlined in the Paris MOU, with the exception of two specific instruments as noted in the 2018 Mediterranean Memorandum.

The International Convention on Load Lines, 1988 and the International Convention on Tonnage Measurement of Ships, 1969.

According to the 2018 Mediterranean Memorandum, the selection of ships gives priority to the following types:

- Ships making their initial visit to a port whose Administration has signed the Memorandum or returning after a twelve-month absence or more.
- Ships authorised to leave a port whose Administration has signed the Memorandum, provided that any deficiencies are corrected within a specified timeframe after the expiry of the deadline.

- Ships flagged by port authorities due to potential safety risks that could endanger their navigation.
- Ships that hold certificates relating to their construction and equipment, but do not meet the requirements described in the applicable legislation.
- Ships carrying hazardous or environmentally harmful substances, without full disclosure of relevant information.
- Ships which have been subject to safety-related suspensions by their classification societies within the last six months.

It is noted that the Mediterranean Memorandum does not address ships that have deficiencies that cannot be corrected while in port and whose flag state has not signed the Memorandum. The specific protocol on whether these ships are allowed to proceed to the next port remains unclear in the context of the Mediterranean Memorandum of Understanding (2018).

Section 6 of the MoU provides that authorities should make every effort to establish appropriate training programmes and seminars. It is strongly argued that port state inspectors prioritise training and seminars above all else. The majority of members in the various Memoranda do not have the necessary know-how. Before approving any Agreement or MoU, maritime authorities should guarantee that they have a sufficient number of qualified inspectors (Mediterranean MoU, 2018).

Uniformity of inspection standards in all Member States is ensured through this approach. Currently, states integrate and then define training requirements for their personnel (Mediterranean MoU, 2018). Under the Memorandum, each Authority conducts inspections and reports on its findings following the established procedures. The Authorities regularly provide the Secretariat of the MoU with the necessary information, which is then updated at intervals of at least three years (Mediterranean MoU, 2018).

Port State inspections shall operate with a limited number of inspectors working on their behalf. These checks shall be carried out on a part-time basis.

- The quantity of ships entering ports on an individual basis.
- Any possible charges related to inspections.

In addition, with the finalization of the MoU, the establishment of the Memorandum Committee takes place, which consists of one representative from each participating Authority.

The International Maritime Organization (IMO), the International Labour Organization (ILC) and the European Commission are invited to participate in the Commission's efforts as non-voting participants. In addition, the Committee reserves the right to invite representatives from Maritime Authorities of other Mediterranean coastal nations, as well as any other relevant Organization or Authority, to attend as non-voting observers (Mediterranean MoU, 2018).

2.6. Current factors influencing port state control (psc) implementation – inspections

Port authorities understand that it may not be cost-effective, and at times necessary, to inspect all foreign vessels entering their ports— the international ships. Port authorities carry out inspections on some foreign ships at set target rates. They do this so that they have to inspect a percentage of even the smallest number of ships calling at their ports. The use of databases for drawing up the list of ships to be inspected introduces a number of such databases. The one maintained by the Paris MoU is example of national database. International databases include EQUASIS. The criteria used by port authorities in their targeting system to identify ships that are below par and therefore require an inspection are known as "targeting factors".

the targeting factors are generic because these characteristics are by their nature precursors of deficiencies. Above all, these characteristics embody ship type which proves to be very essential since all ship categories have different requirements owing to the difference in cargo they carry. Statistical research has confirmed that bulk carriers and general cargo vessels receive a greater number of inspections and detentions. A vital characteristic is the ship's age. Many States tend to inspect older ships more frequently because an older vessel is considered to pose more environmental risk than a newer one. The most important are the flag of the ship and the classification society. In most cases, deficiencies and detentions come from the flag State and classification. Deficiencies and detentions have shown that flags of convenience have a large number.

Another special characteristic is with the previous history of the ship. If the vessel has had problems in the past or suffered another detention or deficiency it will be more likely to be inspected. The last one is with the shipowner's history. The history and performance of all ships in the company's fleet are important; all these criteria directly affect the ship's operation. For that reason, each MoU has developed a specific scoring system, it helps in the identifying of these targeting factors.

In addition to the aforementioned targeting factors, there is another group of factors that are equally important and referred to as "overriding factors." These are the factors that provide

the inspector with an excuse to go straight on to do a more detailed inspection or an extended inspection. The factors are for ships reported by another Member State and normally give immediate cause for concern, those responsible for an accident or grounding (or even a collision) at the approach channel to the port. Third are the ships which blamed for an alleged violation of the provisions—on discharge of harmful substances or effluents. An overruling factor is also the case where a ship has not complied with safe navigational practices and procedures. There are some others not in the database; all these influence the international standards of ship inspections.

CHAPTER 3. RESEARCH METHODOLOGY

Data in this study was collected from PSC inspections conducted by the recognized organizations at the MoU Tokyo which covers 21 maritime authorities. These inspections are applied to foreign ships visiting ports in Asia-Pacific to secure compliance with safety and pollution regulations E.g living & working conditions; pollution control; security of and safety on board. The data was collected from the APCIS system. The APCIS is designed to store information related to ship inspections.

In this context, the bibliographic approach method is specifically used. Literary research serves as a means to analyze a topic, with the aim of addressing questions without the need to collect empirical research data that would support the conclusions. Rather, it is based on information based on literature, including empirical and theoretical studies, as well as other written works. The methodology of writing the literature research consists of:

1. summary of the concepts of bibliographic data examined,
2. categorization of these data,
3. presentation of the data comparatively,
4. critical evaluation of the data and
5. their synthesis into a coherent new text.

Through literature research, we aim to address research that is not based on empirical research data, but through the critical examination of published papers related to our subject, including empirical studies, theoretical studies, or even additional literature research. This includes summarizing, organizing, comparing and synthesizing previously published material.

The benchmarking process includes three main steps, which are:

- 1) Data related to the Paris Memorandum of Understanding that needs to be collected.
- 2) Key performance indicators being identified for analysis in this study.
- 3) The deferent periods before and after NIR are analyzed. In particular, in the annual reports of facts and figures of overall inspection regimes under the Paris Memorandum of Understanding, which will be set out is the annual reports laying a sound ground of subsequent analysis.

CHAPTER 4. ANALYSIS

4.1. Comparative approaches

Port State Control (PSC) is an internationally established foreign ship inspection regime whereby, through the use of international conventions and agreements, substandard ships that visit foreign ports are identified. There are ten PSC-related MoUs at present, in 116 states/regions around the world, which address the identification of substandard vessels (Xiao et al., 2020). Yet different memoranda of understanding for the PSC have different selection and inspection systems.

First five of them are Abuja Memorandum of Understanding, Acuerdo de Vina del Mar (AVM) Memorandum of Understanding, Riyadh Memorandum of Understanding, Caribbean Memorandum of Understanding and Mediterranean Memorandum of Understanding. They implement systems with risk-based targeting, annual inspection rates. For example, the Caribbean MoU (2018) aims to attain an annual inspection rate per country of 15% within 3 years.

Secondly, the Paris MoU in 2011 developed NIR with an ad random rate of inspection, which was later followed by Tokyo MoU in 2014, the Black Sea MoU in 2016 and MoU IOR in 2018. Taking an example of Tokyo MoU, NIR prescribes scope, frequency and priority of inspections to be provided based on ship's risk profile which can be categorized as high-risk ship (HRS), standard risk ship (SRS) or Low-risk ship (LRS). According to Tokyo MoU (2018), the periodical interval between two successive inspections for LRS is longer compared to an SRS and HRS.

Third, USCG has its own system. Its inspection rate is 100% per vessel in terms of targeting matrix. (USCG, 2018).

Since 2012¹¹ more MoUs started using NIR as an inspection regime instead of implementing RBT systems with specific inspection rates. NIR has its own strict scoring system for confirming a ship's risk (0 or 1), and then decides whether or not to inspect the ship basing on i) inspection priority or ii) additional inspection requirements.

Hence NIR is likely to be more effective than IR other. Although the most recent literature has shown that previous works have mainly focused on NIR without comparing the same with other inspection regimes (Yang et al., 2018a, 2018b; Graziano et al., 2018; Wang et al., 2019b), this best inspection regime to carry out PSC is still not determined. Therefore, in this paper, compares the effectiveness of inspection of three different selection and inspection systems using a measure based on super-sbm and the Malmquist production index (MPI). The results of this comparison are a detailed information about current status of inspections, and which have important policy implications.

New requirements for bulk carriers 150 m and above concerning survivability and arrangement to avoid foundering when water enters the ship by any cause. The IMO has also adopted revised guidelines related to bulk carrier inspections and a Code of Practice for Safer Loading and Unloading concerning BLU Code. Its key points are:

1) The bulkhead between tanks 1 and 2 and the double bottom of tank 1 for existing ships shall be additionally reinforced to withstand flooding in tank 1 unless loading restrictions have been imposed.

2) Damage Caused by Conveyor Belts, Large Calipers, Bulldozers, and Hydraulic Hammers are Improving. Cargo handling practices conveyor belts frequently overload ships and large calipers, bulldozers and hydraulic hammers used in unloading can cause damage.

Cargo transport restrictions: Bulk carriers already in service which achieve the new requirements via restrictions on loading shall be marked with a solid equilateral triangle at midships below deck line on the hull. Loading instruments: There shall be fitted on the ship appropriate instruments for the control of stresses during loading and unloading (bending moments). Enhanced inspections: program of inspections to find any potential weaknesses in the structure of the ship or locations of corrosion.

The Commission presents what it proposes to change in the PSCD, including technical ones, to completely transpose the new international rules and enhance the key elements for

fostering digitalisation of the shipping industry. The modifications the proposal and its annexes would introduce are, in particular: all duly explained in the Impact Assessment report.

Coverage of developments under international conventions: The revision of the PSCD will do no more than incorporate two new international legal instruments into the EU rule and all that implies for the IMO Ballast Water Management Convention and the recently adopted Nairobi International Convention on the Removal of Wrecks. The revised PSCD would also be fully aligned with the Paris MoU currently for altering a single criterion of Annex 1, usually as simple as ‘shape of dairy products’ (example) a single sentence or even a word at the end of one, another complete set of legislation needs to be brought forward.

New Requirements for Inspections. The new requirements for inspections will inter alia mean that Member States must check foreign ships in EU ports. This would then allow a better possibility of making the inspections efficient. The revision of the PSCD shall modify Annex 6 (SWD(2023) 148) The Ship risk profile on which the current targeting of ship for inspections is based to give greater consideration to environmental factors. For cargo and passenger vessels over 5 000 gross tonnes, the risk profile as amended would include the IMO carbon intensity indicator for an individual ship. For all ships eligible for PSC, it adjusts the weighing factors so as to give more weight to previously identified environmental-related deficiencies and detentions stemming from ships during an inspection.

Proposed to extend the scope to fishing vessels. The proposal of the Commission is to extend the PSCD to fishing vessels over 24 meters in length where significant safety concerns persist. The Commission further proposes establishment of a voluntary PSC system for those vessels of this type calling at EU ports and wishing Member States to carry out these inspections as a second line of defense. These would consist of guidelines, training and database for the inspection aimed at the ship to report inspections. It is to be underlined, however that the safety of fishing vessels is mainly the responsibility of the flag State.

In 2010, the year before NIR started being applied, detentions drop to the second-lowest figure up to now, that is 3.28%. It was not into force at that time but remember the new regime was proposed in 2009 and adopted this year officially at the 43rd session of the PSC Committee in Dublin. In the words of the revolutionaries, some shipowners, “Ah, now that the NIR has been intimated for introduction in 2011, may have frontally moved their substandard ships to other trading areas.” So it’s no big surprise that many figures indicators this year dropped to a relatively low level (not only detentions) to other KPIs which are analyzed below.

After the implementation of the NIR, there was a first spike in detention rates, followed by a temporary reversal of this trend in 2014 and 2015. After two years of growth (2016 and 2017), the detention rate dropped significantly in 2018 to its lowest level in a decade. In general, the trend of detention rates can be divided into four phases: growth (2011-2013), decline (2014-2015), growth (2016-2017), and downturn (2018-present).

Growth phase 2011-2013: Initial phase after NIR implemented slight increase in detention rates This can be explained by the fact that the focus of the NIR target is on higher priority ships. It takes time for both ship-owners and port Authorities to become familiar with the drastic change inspection system. Therefore, it is inevitable the rate of detention corresponding to that period has increased.

Decline phase 2014-2015: After detention rates had increased initially, the trend reversed in 2014. This is mainly because a large number of substandard vessels were banned in the region after three years of hard work having been detained several times during this period. Many of them were recycled after losing their trading areas, some have been transferred to other parts of world where NIR has not yet been introduced.

B. Detention rates reached their peak during this period There are two reasons for this phenomenon. First, shipowners and shipping companies take action on the "weakest link" of the Paris MOU area which is the southern part. They willfully operate substandard ships in the region since the risk of detention, and the costs for rectification of defects are low as compared to the cost of operation in "good faith". Second, as economic pressures increase, shipowners may start cutting corners in areas where this is possible to bring down the operating costs of their vessels and remain competitive. The Paris Memorandum of Understanding has taken a number of measures to overcome these difficulties but the rate of detention has reached to it's peak.

As for the Decline phase (2018-present): The detention rate is much lower because, as you all know, the past year the economic environment has seen a major turnaround. Also, a decision on the NIR's betterment was taken at the Paris MoU Committee through other measures. Regional cooperation with other Agreements was stepped up significantly in order to contain substandard ships around the globe. As a result, detention rates are at a record low over the past few decades.

Detention rates are expected to continue to decline in the future, or at least remain at the level registered in 2018.

It has been perfected in one sense through many years of hard work. Nir two years or more being trained jointly with emsa and cic would have developed a more or less complete form for reports based on the reports and statements of the paris memorandum of understanding. Second, the increment in the progression of fines regarding substandard ships in the paris mou will at some point contribute to an overall increase in the quality of vessels undergoing inspection. Third, the drastic drop in numbers specifically for the year 2018 indicates the challenge of really surviving the rogue ships in the paris memorandum of understanding region. Different forms of analysis — exponential format, logarithmic format, and polynomial format — do show that momentum of retention rates has generally continued to decline since implementation of NIR.

The spiral analysis shows that vessel quality has improved because of NIR implementation which acts as an stimulant to shipowners to pay more attention to their ship maintenance and a signal for port authorities to reinforce monitoring of vessels under inspection, so detention rates are expected to remain stable in the future under condition that they do not continue to fall.

4.2. Review of the latest studies on security controls

From these, different ways were used to appraise and bring out information on the factors affecting maritime safety. In particular, banning ships as they leave the port are major interests bound in the area of maritime safety and environmental protection. When a ship is bound in port, the need for shipping lines to choose alternative ships is one of the complications that may follow, thereby increasing their operating costs. The compensation actions by ship owners further underline the need for studies on ship bookings through the PSC, given the works of many authors. Detention of ships is made in compliance with the PSC regulations, ISM, fire safety installations, and emergency systems as key factors in the area under Tokyo Memorandum were considered by Chen et al. (2022).

The seaborne sector is one of the significant sectors comprising 90% share of world trade volumes. It delivers a low-cost and energy-efficient clean modes transportation very important for growth of international trade. The efficiency is very high for the 2 variants; freight and people. For these benefits to be fully realized, ships have to be compliant with the international regulations and standards of quality set. Rwandan workers are safe: Standards in place for the safety and workers of the workers in the maritime industry. This thereby creates

an inspiring environment for continuity in preventing any harmful damage to the marine environment, ensuring sustainability (Chen et al., 2022).

Generally, compliance with international maritime rules and its public perception will create a safer and cleaner shipping environment. PSC inspections have an objective to identify non-compliant vessels since all incidents are not able to cause a marine casualty or pollution. The media publicity ensures public awareness of the impending dangers and strengthens the felt urgency required for primary intervention by society. This is why PSC inspections must increase such accidents by identifying the causative factors, which have high risk contribution associated with detention in Chuah et al. (2022b).

PSC plays a vital role in eradicating ships that are non-compliant. As indicated by the 2022 Memorandum of Understanding on FSA in Asia-Pacific Region (Tokyo MoU), cooperation by members States and harmonisation of FSA activities is essential for the effective regime in the region to reduce unregistered vessels not meeting standards. Nine conventions that offer the basic framework for development of measures for protection of the environment and maritime safety.

IMO Resolution A.1138(31), PSC procedures (2019) define a ship as rudimentary if machinery, equipment, operational safety, or hull is significantly below specified standards of relevant contracts. And if the ship's crew does not comply with the requirements of the safe manning document, then this too can be considered as rudimentary. It underlines strong respect toward relevant conventions and ensuring that crew members are trained and equipped to be able to handle the ship in safe and efficient conditions, which may lead to improving safety and environmental performance on ships and therefore sustainability of maritime practices. (Şanlıer, 2020)

The origins of the PSC go back to the 1978 Hague Memorandum, which was set up with the aftermath of the Amoco Cadiz incident, a large oil tanker accident. The IMO-supported PSC regime was initiated in 1982 through the Paris MoU. In the 1990s, stringent legislation specifically directed towards work and working conditions on board, pollution ship prevention machinery and safety of life at sea were enacted by IMO members as a precedent for the establishment of the PSC regime. Vessels calling at ports of the nine regional PSC regimes will be exposed to PSC security controls; Persian Gulf (Riyadh MoU-2004), Indian Ocean (Indian Ocean Memorandum-1998), Mediterranean (Mediterranean MoU-1997), Black Sea (Black Sea MoU-2001). West and Central Africa (MoU Abuja-1999), Caribbean (MoU-1996 Caribbean),

Asia-Pacific (Tokyo MoU-1993), Latin America (Vina Del Mar Agreement-1992) and Europe/North Atlantic (Paris Memorandum-1982). All these regional regimes as observers of inter-govt organizations by the IMO.

The Tokyo Memorandum of Understanding is the Asia-Pacific region framework for the implementation of PSC activities, signed on 1 December 1993 and entry into force on 1 April 1994. The 21 member governments are Australia, Malaysia, Republic of Korea, Canada, Hong Kong, Fiji, Japan, Vanuatu, Thailand, Vietnam, Russian Federation, Chile, Marshall Islands, New Zealand, Indonesia, Philippines, Panama, China, Singapore, Peru and Papua New Guinea. Asia-Pacific Maritime Information and Advisory Services is developed and maintained under the supervision of Ministry of Transport of Russian Federation, Moscow. The system aids EPA officers in the selection of vessels for inspection purposes and sharing EPA inspection history effectively through an integrated database system. (Chuah et al., 2022b)

The attending PSC officer team is qualified members led by proper persons who will perform a thorough assessment of the condition of the ship by checking certificates and documents, as per Chuah et al. (2022b). A more detailed inspection is caused by missing required certificates or obvious defects. The team of inspectors after that writes a report, completing all information on any deficiencies found, such as name of the ship, IMO Mobile Service Identification Number (MMSI), call sign, RO, flag status, flutation date, deadweight/tonnage, name of the master, specific legal certificate (RO issue, RO inspection, date of issue/expiration date, date of inspection/port inspection), place of inspection, name of PSC officer and company details, as Chuah et al. (2022b) noted. Action When deficiencies identified constitute a direct threat to maritime safety or the environment in port, the vessel shall be detained, and a report of the date and place of detention shall be issued. Identified deficiencies may not be continuous. They have to be closed and rectified. Before departure.

As such, according to the paper of Hanninen and Kujala (2014), a BN model can identify critical inspection areas directly related to marine accidents (maritime safety), rescue equipment, fire safety and others. Hidden variables in the model are described by them for the accident causality mechanism or system variability. The dataset used in the analysis by them was limited and not all areas were investigated in every case. Some of the cases were not fully completed during the implementation of these studies. The assessment program improvements were mainly defined via expert opinion combined with some experiences from revealed accidents.

Data-drive and Bayesian network approach in analysing PSC related risk factors and modelling probability of detention of a ship were developed according to the 2005-2008 survey data for bulk carriers in seven major European countries under the Paris MOU. Identification of the main risk factors of PSC inspections was carried out during the accompanying survey, where the important factors include counts on the number of deficiencies identified during inspections, type of inspection, RO and age of the ship. The Bayes network models show a quite good record in predicting probabilities of detention under different conditions, which might be used as a good input for port authorities in regulation optimization and resources allocation for inspection activities. The results are specific to this type of ship and may not apply to other areas or other types of ships.

Another study that used relatively ample data is the work of Yang et al. (2021) from the Paris MoU electronic inspection database for the years 2015-2017, consisting of 49,328 inspection records. The new ship booking risk control methodology was introduced by integrating BN into the TOPSIS method in similar ordering through a similarity approach to an ideal solution for decision making. The methodology develops decision criteria from key risk variables and explores strategies already established and used by ship owners to control ship ban risk. It was found that most important factors which have influence to detention rate of bulk carriers are age, flag and RO. The application of the methodology is limited to bulk carriers; other types of ships should be checked for its effectiveness.

The authors have identified 25 inspection reports drafted by EMSA, examining inspections conducted by Member States to assess the level of implementation, compliance, and alignment with Directive 2009/16/EC. The research was aimed to find out what kind of disparities exist between the policy standards set by the directive and the actual implementation carried out through inspections. Moreover, it evaluated the discrepancies of Member States after the implementation of the New Inspection Regime with the implementation of the above directive.

This was a Tree Augmented Naive Bayes method-based Bayesian Network classifier developed by Wang et al. (2019) to identify high-risk foreign ships at ports. This classification model offers another tool for PSC authorities to identify ships with relatively lower standards of compliance and, therefore, effect a more strategic allocation of resources for inspections. This research was done after the prescription by Chen et al. (2019) analyzing the detention data from port states of Asia-Pacific region in last decade information reported at Tokyo MoU. The

research was aimed at helping port states enhance the effectiveness of ship safety inspections with practical measures in their study.

The recent study by Knapp and Heij (2020) has enhanced the possibilities of ship identification for inspection and area prioritisation. Laying down the footprints of identification and growing impetus for aware risk management maritime ...performance possible this derivational will prove to be more useful in aiding search efforts than those mentioned above. The present study...categorises vessels according their risk profiles, which presents an additional parameter to target search efforts.

Yuhong-Wang et al. (2021) developed a probabilistic risk model for analyzing the risk factors associated with PSC inspections. The present study applied Bayesian Network analysis to the same data obtained from Tokyo MoU inspections held from 2014 to 2017 to understand the dependence and interdependence of these factors. Safety-related defects and technical conditions of vessels were identified, in their study, as the two most important risk factors for a vessel to be detained in PSC inspections. The higher the tawdryness shape, the more insusceptible to motion that particular style becomes. The command of spirals that is found on this little boot comprises a ornate fringe that is added for both warmth and flair. The interior lining ensures that these shoes are able to keep your feet warm while regulating the moisture output from them.

In this text Prieto et al. (2021) described in detail an analysis of the inspections realized during the 2013–2018 period at the major European ports within the framework of Paris MoU using multivariate statistics (STATIS). Such analyses allowed obtaining flag and company classifications in conformity with annual list publications by Paris MoU. Their research provides evidence for the effectiveness of the method of classification through multivariate methods. The findings of the research provide a useful indicator for maritime administrations in any country to assess the risk profile of a vessel and make well-informed decisions on choices related to inspection. In this sense, the current work reported in this manuscript is partially in line with the above results but using a different multivariate technique, that is the HJ-Biplot.

Liu et al. (2022) assessed detention risk with confidence by identifying its determinants using Bayesian network technique with PSC training data. The results of this study can provide valuable information for shipowners to manage detention risks proactively and for port authorities to make the ship's checklist more prioritised and inspections more efficient the.

These authors used the Paris MoU data of 71,376 defect records involving 496 defect codes for 21 ship types. Applicable the grey relational analysis and technique for order preference by similarity to the ideal solution. The model developed in their paper for focused inspection campaigns is able to recognize effectively substandard ships. Their study is original since the authors applied many univariate techniques to identify ships below the desired safety levels.

In the latest maritime transport pollution study, pollutant emissions were reported for 30 US ports by year 2021. The output data of this study were records from the Automatic Identification System data and it applied to the factors that influence pollutant emissions by ship a multiscale regression model weighted geographically. In the research, non-homogeneity of ship types and distributive imbalance of ship pollutant emissions across various ports were established. Recommendations are thus for port managers to take into account the setting of the number of ship transactions as a function of the length of the port's coastline.

In another work, AIS was concerned with giving quality information for building maritime traffic patterns in the Beibu Gulf; their findings justify developing an operational system for identifying shipping channels to facilitate maritime traffic management. Most marine environmental protection considerations gave the authors an impetus to develop a method of oil spill damage assessment for the Arctic region. The most recent approach proceeded to develop an ANP-based fuzzy integral assessment model for evaluating oil spill damage in the Arctic regions. For any accident, this methodology allowed the determination of area-scale effects and general results specific to an oil spill (Chen, et al., 2022).

CHAPTER 5. CONCLUSIONS

5.1. Conclusions

At the moment there are some advantages relating to the PSC inspection regime. however, maritime and port administrations should look into optimization existing recourses for the ships that are likely to breach safety and pollution prevention standards. PSC inspections are where assessed is whether ships meet the standards required and their may be any identified deficiencies that may attract further inspection or detention by the PSC. The findings revealed that ship detentions result from several other factors besides the deficiencies noted during PSC inspections. it is thus very important to conduct appropriate research on the factors influencing PSC inspections to cut the number of ship detentions and prevent substandard ships from

sailing on open seas. such an identification of factors by the PSC could assist in reducing the pool and thus increase the specificity of inspections in Asia-Pacific ports.

The management knowledge gained showed that NIR was not all positive impacts and was exposed to some additional improvement requirements. Therefore, it calls for a future research agenda, for example: Retention fluctuates significantly after the implementation of NIR, as do other key performances indicators. Many of the company's high-performance vessel pointed out they do not benefit shipowners under current regime. Moving beyond ISAs requires new institutions, particularly regional agreement to facilitate cooperation and effectively monitor the performance of companies.

The detention turned out that the flag State is the most influential factor of detentions acting as a numerator compared to others. In the order of increasing importance came “flag State”, “ship type”, “authority” and “ship age”. This new study is a valuable resource for PSC authorities in purifying risk factors and making predictions on which detained ships or inspected in the future. Port state control shall hereby use the identified risk factors to screen ships for inspection. A completely effective and time-saving new workflow on PSC will be the result of it. The detainable risk factors could help in detecting detainable ships and ensure safety at sea. The research was able to lead ships on the risk factors of detaining a ship after PSC inspection and recommendations for risk factor at detention for safe navigation plus standard operating procedures. By calculating the rate of each risk factor resulting in ship detention, then the significance of these factors in detentions can be determined.

5.2. Limitations and Future Research

This is, however, only a limited key, lack of resources for the gradual improvement and reformulation of state port control regulations and procedures. Such further research would be to add other potential influencing factors of inspection leading to detention to this current study such as the type of deficiencies identified during the inspection. The analysis of relationships between the selected factors is required for further development of the model, being definitive and complete. Warning in the findings of this study to ship owners and operators to keep up their ships in maintenance condition, have the documentation and certificates in order and standard operations going on to prevent detainment of their ships during PSC inspections.

Although this study is quite informative concerning the ship detentions' risk factors through PSC inspections, including their actual reasons, there are still many issues left for

future research. These may include expanding the database on associated risks, consideration of the other effectiveness of applicability to other regions and implications for economics and operations in the way of maritime transport sector. This study is a proper long-term research basis; longitudinal research should be based on its recent years. Some other critical causal factors such as the size of the ship, state of its material, crew competencies, and operational factors are still unaddressed for full comprehension arising from the findings from historical data. The generalizability to other regions with different characteristics or ports having different regulatory frameworks and to the performance-based outcomes of the inspections set for Member States revealed no other literature available in this context. This shall also include the absolute economic costs and benefits involved of conducting these PSC inspections that directly fall back upon the owners from the merchant shipping industry; therefore, challenges the economic competitiveness related to trade routes and competitiveness among industries.

Flag States provide through a system of agreed measures to be pursued after PSC inspections at high-risk States: increased monitoring, more inspections and tougher enforcement. Ship types should also be capacity to have guidelines and rules tailored to precautions and control relative to their risk and operational prevalence. ROs are therefore very enforcers in view of their surveillance and oversight activities over competence, independence which is reinforced by additional accreditation and auditing activities as well as promoting more transparency and accountability. It also comprises the need inspection body in regular and uniform practices, together with the coordination practices, information sharing practices, best practices capacity building activities needed for the support of the inspection body. The age of the ship is also a noteworthy parameter that increases because of the need for proactive actions such as focused maintenance, retrofitting, up-gradation to meet the issues due to older ships. One of the recommendations of this study's policy is improving the regulatory oversight on Flag States. These include the development of tailored inspection regimes for different ship types, enhanced accreditation and audit processes for Recognized Organizations, and putting in place measures to address the issues related to older ships. The coordination and information-sharing by inspection authorities.

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