

Maritime Safety and the Responsibilities of Shipping Companies

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Abstract: This paper aims to discuss aspects of maritime safety and the responsibilities of shipping companies in ensuring safer maritime operations and the sustainability of seas and oceans. The main objective of this study is to examine the responsibilities of shipping companies in managing safety issues in waters and analyze the challenges faced by the shipping industry. The rapid development of the global shipping industry, along with increasing demand for goods transportation, has led to various safety issues that require serious attention. Current maritime safety concerns in shipping include risks of maritime accidents, piracy, chemical spills, and damage to navigation equipment. The methodology used in this study is a literature review that involves analysis of official documents, maritime incident reports, and international safety regulations such as SOLAS (Safety of Life at Sea). The structure of the paper consists of four main sections: the development of the shipping industry, current safety issues, the responsibilities of shipping companies, and recommendations for improvement. The findings suggest that shipping companies need to be more committed to safety training, compliance with international regulations, and the adoption of new technologies to enhance maritime safety. The way forward emphasizes the need for collaboration between governments, enforcement agencies, and shipping companies to ensure better maritime safety in the future.

Keywords: Maritime safety, responsibilities of shipping companies, shipping industry, safety regulations, maritime emergencies.

Introduction:

Transportation has undergone a massive transformation from land-based systems to maritime transport in line with the progress of human civilization. Since ancient times, humans have used ships to sail across the seas, transporting various goods and resources for trade and communication. This shift was further strengthened during the industrial revolution in the 19th century when iron ships replaced wooden ones, accelerating trade

flows between continents. The main advantage of maritime transport lies in the large capacity that ships can carry compared to land or air transport. As a result, maritime transport has become one of the most important economic sectors in global trade. Today, the seas play a crucial role in supporting shipping, navigation, and international trade industries. More than 80% of world trade involves the transportation of goods by sea, making this sector the backbone of the global economy. The sea is not only a primary route for trade between countries but also a vital source of raw materials for various industries. The shipping sector supports the transportation of goods such as crude oil, natural gas, metal ore, agricultural products, and various other goods worldwide. This importance has led countries and shipping companies to take responsibility for ensuring safety and smooth operations at sea, with maritime safety becoming a major issue.

The shipping and navigation industries play an extremely important role in international trade, connecting ports around the world. The oceans surrounding the large continents are not only a source of natural resources but also a main channel for the movement of goods between countries. In this context, several major shipping routes that connect the world's key ports have become determining factors for the smooth flow of global trade. The Strait of Malacca is one of the busiest shipping routes in the world. Connecting the South China Sea with the Indian Ocean, this strait is one of the most important shipping lanes globally. Located between the Malay Peninsula and the island of Sumatra, Indonesia, the Strait of Malacca links countries such as Malaysia, Singapore, and Indonesia with key ports in India, the Middle East, and East Africa. In addition to being a key route for goods trade, such as oil and electronic products, the Strait of Malacca is also important from a maritime safety perspective, as it is often targeted by piracy activities. Therefore, security control in this area is a priority for the countries involved.

The South China Sea is an essential trade route between East Asia and Southeast Asia, including China, Taiwan, Hong Kong, Japan, as well as Southeast Asian countries like Malaysia and Vietnam. Furthermore, the South China Sea also serves as a major connector to the ports of India and the Middle East. This route supports the transport of various types of cargo, from raw materials like oil and natural gas to higher-value manufactured goods. Given its importance in the global supply chain, the South China Sea is also a strategic area that is often a focus of political attention, with competing territorial claims from the surrounding countries. The Strait of Hormuz is a narrow passage linking the Persian Gulf with the Arabian Sea. It is one of the most important shipping lanes globally, particularly for the transportation of crude oil and natural gas from major Gulf producers, including Saudi Arabia, Iran, and the UAE. This strait handles nearly a quarter of the world's oil transport, making it crucial to global economic stability. Any disruption or tension in this area, such as those seen in past geopolitical conflicts in the Middle East, can have a significant impact on oil prices and global energy markets.

The Atlantic Ocean serves as a major trade route between North America, Europe, and Africa. This route connects major ports like New York, Rotterdam, and Lagos and plays a central role in intercontinental trade. It is also a busy route for transporting goods such as automotive products, chemicals, and electronics, serving as an important route for large shipping companies like Maersk and CMA CGM. The primary advantage of the Atlantic Ocean lies in its connection to the economies of developed countries in Europe and North America, making it critical to the smooth flow of international trade. The Pacific Ocean, linking East Asia with North America and Australia, is one of the largest and busiest shipping routes in the world. Major ports in East Asia such as Shanghai, Tokyo, and Busan are closely connected with ports in North America, including Los Angeles and Vancouver. This route is also significant for trade between countries in Asia and Australia, with key cargo including electronics, textiles, and agricultural products. With increasing trade between Pacific nations, this area continues to grow as a hub of rapid economic growth.

The Bering Strait separates Asia from North America, linking the Chukchi Sea in the north with the Bering Sea to the south. This route has become important for trade between ports in Russia and the United States, though it is not as active as some other shipping routes. The Bering Strait also has strategic military and natural resource management importance, as it connects major countries on both sides of the sea, including Russia, Canada, and Alaska. Located in Egypt, the Suez Canal is a channel that links the Red Sea with the Mediterranean Sea. It plays an essential role in trade between Europe, Africa, and Asia. As a route connecting two major seas, the Suez Canal reduces the travel time for ships that would otherwise need to navigate around the entire African continent, making it one of the most important shipping routes in the world. This route handles a significant volume of cargo, including oil, gas, and industrial goods, and serves as a vital link between major ports in Europe, Asia, and Africa.

The Panama Canal, located in Panama, is a waterway that connects the Atlantic Ocean with the Pacific Ocean. As a primary trade route between North and South America, as well as a key link between Asia and Europe, this canal has become one of the most important routes for global maritime trade. The Panama Canal facilitates the transportation of cargo between ports on both continents, including goods such as food, electronics, and raw materials. This canal continues to play a vital role in enhancing the flow of trade between these continents. The Strait of Dover is one of the busiest shipping lanes in the world, connecting the North Sea with the English Channel. As a crucial route between ports in the United Kingdom and Europe, the Strait of Dover supports trade between European countries and the UK. It also serves as a primary channel for vessels heading to major ports in Western and Northern Europe. These key global shipping routes not only facilitate the transport of goods but also play an essential role in maintaining

global economic stability. Each route presents its own set of challenges, whether in terms of safety, politics, or the environment. Therefore, it is crucial for countries and shipping companies to ensure the effectiveness of maritime safety systems and compliance with international regulations to guarantee the smooth flow of global trade. These routes, with their significant importance, continue to form the backbone of the shipping industry and the global economy. Below is a table containing details of some of the world's major shipping companies, their registered addresses, key shipping routes, and the types of cargo carried by commercial ships.

Table 1: Company Names, Registered Addresses, Main Shipping Routes, and Cargo Types

COMPANY NAME	REGISTERED ADDRESS	MAIN SHIPPING ROUTES	TYPES OF CARGO CARRIED
Mediterranean Shipping Company (MSC)	10-12, Chemin Rieu, 1208 Geneva, Switzerland	Asia, Europe, North America, Africa, South America	Manufactured goods, raw materials, food, jewelry, electronics
CMA CGM Group	4, Quai d'Arenc, 13002 Marseille, France	Europe, Asia, Middle East, Africa, North America, Oceania	Oil, gas, raw materials, manufactured goods, agricultural products
Hapag-Lloyd	Ballindamm 25, 20095 Hamburg, Germany	Europe, Asia, North America, Middle East, South America	Manufactured goods, chemicals, automotive products, general container cargo
Evergreen Marine Corp.	No. 333, Sec. 1, Keelung Road, Taipei, Taiwan	Asia, Europe, North America, Australia, Middle East	Crude oil, electronic products, chemicals, manufactured cargo
COSCO Shipping Lines	No. 1, Baidu Road, Shanghai, China	Europe, Asia, Africa, Middle East, North	Manufactured cargo, metal ores, electronic products, chemicals,

COMPANY NAME	REGISTERED ADDRESS	MAIN SHIPPING ROUTES	TYPES OF CARGO CARRIED
		America	food
NYK Line	3-2, Marunouchi 2-chome, Chiyoda-ku, Tokyo, Japan	Asia, Europe, North America, Australia, Middle East	Automotive products, chemicals, electronics, general cargo containers, food products
Yang Ming Marine Transport Corp.	No. 168, Minchuan Road, Taipei, Taiwan	Asia, North America, Europe, Middle East	Manufactured cargo, raw materials, automotive products, jewelry
ZIM Integrated Shipping Services	14 Andrei Sakharov Street, Haifa, Israel	Europe, North America, Asia, Middle East, South America	Manufactured goods, chemicals, oil, food, electronics
Hyundai Merchant Marine	20th Floor, 16, Teheran-ro, Gangnam-gu, Seoul, South Korea	Asia, Europe, North America, Middle East, Oceania	Manufactured cargo, automotive products, chemicals, electronic goods, food

Source: Reorganized from Maersk Group. (2024). *Annual Report 2023*.

For further in-depth information about these companies, their official websites typically provide up-to-date information about shipping routes, cargo types, and the main ports they operate from. However, as the sector evolves, maritime safety risks also increase, necessitating serious attention to the responsibilities of shipping companies in ensuring the safety of their operations. With the rapid growth of the global shipping industry, maritime safety has become a critical issue requiring stricter preventative measures. Risk management, safety regulations, and compliance with international law are essential to ensure the smooth and safe operation of maritime navigation. This paper aims to examine

the responsibilities of maritime transport companies in addressing increasingly complex maritime safety issues and assess the steps necessary to ensure future safety at sea.

Research Methodology

The introduction to maritime safety and the responsibilities of shipping companies requires a comprehensive and systematic approach. To address this issue, the methodology employed must provide a deep understanding of maritime safety, the role of shipping companies in complying with safety regulations, and risk management associated with shipping operations. This study integrates qualitative methodology, focusing on safety systems thinking and risk management frameworks, as well as theories related to corporate social responsibility (CSR) and management ethics. This approach allows the researcher to explore not only the technical aspects of safety but also the legal and social responsibilities that shipping companies must consider. The most suitable methodology for this maritime safety study is a qualitative approach with case study techniques and document analysis. This approach facilitates an in-depth investigation into the role of maritime transport companies in handling safety and examines how they comply with international regulations and laws. Case studies allow the researcher to analyze several major shipping companies and how they operate in specific situations involving maritime safety incidents. Through case studies, qualitative data can be gathered from incident reports, interviews with industry experts, and official documents related to safety procedures. Additionally, document analysis from international organizations such as the International Maritime Organization (IMO) will provide guidance on the regulations that shipping companies must follow to ensure maritime safety. Furthermore, literature review is an essential element of this methodology, as it allows the researcher to gain a clear understanding of global maritime safety theories. By referencing secondary sources such as books, journal articles, and annual industry reports, this study will integrate multiple perspectives on maritime safety and expand our understanding of the role shipping companies play in upholding their safety responsibilities. This literature review is also crucial for identifying current safety issues faced by the shipping industry and the latest technologies that can enhance safety at sea. The framework of this study focuses on two main concepts: maritime safety and the responsibilities of shipping companies. Maritime safety is a broad topic that encompasses many aspects, including ship safety technology, crew training, and risk management in shipping operations. System Safety Theory provides a strong foundation for understanding how safety in the maritime system functions as an interconnected network involving humans, technology, and operational procedures. This theory emphasizes that safety depends not only on individual components but on the overall system, which must function efficiently and effectively. In this context, this study will analyze how shipping companies integrate their safety systems to reduce the risk of accidents or mishaps.

Additionally, Risk Management Theory plays an important role in this study's framework. This theory focuses on how shipping companies identify, assess, and manage risks associated with their shipping operations. By using risk management tools such as SWOT analysis and impact assessment, companies can make better-informed decisions when dealing with potential risks during voyages, whether related to environmental, technical, or social factors. This study will explore how shipping companies apply these risk management techniques to ensure safety at sea while minimizing potential losses and accidents. Regarding the responsibility of shipping companies, Corporate Social Responsibility (CSR) Theory is relevant to this study. CSR focuses on the social and ethical responsibilities companies must bear in their operations. Shipping companies are not only responsible to their shareholders but also to the public and the environment. In the context of maritime safety, this means that shipping companies must ensure that their operations do not pose a threat to marine ecosystems or coastal communities, while also safeguarding the safety of their workers and passengers. CSR theory highlights the role of companies in fulfilling their obligations to maritime safety laws and protecting the public interest by implementing effective safety policies.

Ethical management theory is also closely related to this study. Ethical management theory emphasizes the importance of making ethical decisions in management, particularly in safety and crisis management. In the shipping context, decisions made by company management must consider the welfare of workers, social justice, and the safety of passengers and local communities. For example, when an incident occurs at sea, management must decide on the actions to take, considering not only financial aspects but also broader moral and ethical concerns. The overall framework of this study aims to deepen our understanding of how shipping companies can effectively manage maritime safety while fulfilling the social and ethical responsibilities demanded by international regulations. This study will also examine how these companies interact with international and national regulatory bodies in efforts to improve safety at sea. Ultimately, this study aims to provide clearer insights into the relationship between maritime safety, risk management, and social responsibility within the shipping industry. Through the application of the appropriate methodology, a solid theoretical framework, and relevant theories, this study will make an important contribution to enhancing our understanding of maritime safety and the role of shipping companies in ensuring safety at sea.

Literature Review

Maritime safety and the responsibilities of shipping companies are crucial issues in the global shipping industry. These responsibilities not only involve the physical safety of ships and crews but also encompass environmental protection and adherence to international legal obligations. Research in this field has emphasized various dimensions, from legal

aspects to the ethical requirements in maritime safety management. In the work “Maritime Safety and Risk Management: An Overview” by S. K. Sharma (2018), the author discusses various factors affecting maritime safety, including the risks faced by ships and how shipping companies are responsible for minimizing these risks through effective management. Sharma emphasizes that, despite the existence of strict maritime safety regulations, there is a lack of law enforcement in some countries, leading to ongoing maritime accidents. The author suggests that shipping companies should improve crew training and use the latest safety technology as key preventive measures. Another relevant study by H. L. Baird in “The Legal Responsibilities of Shipping Companies in Maritime Safety” (2020) examines the legal responsibilities of shipping companies. Baird highlights the obligations of shipping companies under the International Convention for the Safety of Life at Sea (SOLAS) and regulations concerning risk management and safety at sea. This study also delves into the issue of compliance with international standards and the role of national authorities in ensuring the enforcement of these laws. Baird’s findings suggest that, despite increased awareness of maritime safety, some shipping companies still fail to meet the required safety standards, which can have adverse effects on global maritime safety.

In “The Role of Shipping Companies in Maritime Environmental Protection” by M. A. Hall (2019), the author explains how the responsibility of shipping companies extends beyond the safety of vessels to include environmental preservation. This study focuses on the environmental impact of shipping activities, such as oil spills and greenhouse gas emissions. Hall outlines that shipping companies need to play a more active role in implementing sustainable environmental management practices and complying with regulations set by organizations like the IMO (International Maritime Organization). The key finding of this study is that companies that operate in compliance with environmental regulations tend to reduce the risk of marine ecosystem damage and improve their image in the eyes of the international community. An important study by R. M. McGhee in “Corporate Responsibility and Maritime Safety: A Case Study” (2021) analyses cases of shipping companies failing to meet safety standards and the resulting maritime accidents. McGhee shows that the neglect of responsibility by some companies has led to tragedies, not only in terms of human lives but also in financial losses and damage to the company’s reputation. The author urges for increased company accountability through stricter oversight and auditing systems. Overall, these studies provide a clear picture of the crucial role shipping companies play in ensuring maritime safety. Despite various initiatives to improve safety and reduce risks in industry, there is still a need for stricter enforcement and greater corporate social responsibility, especially in protecting the environment.

In discussing maritime safety and the responsibilities of shipping companies, several key issues need to be highlighted to provide a comprehensive and in-depth view. First, the role

of shipping companies in complying with international safety regulations, as outlined in the International Convention for the Safety of Life at Sea (SOLAS), should be a primary focus. Shipping companies are not only responsible for ensuring the safety of their vessels and crews but are also involved in reducing risks that could harm the environment and marine ecosystems. This includes their efforts in managing oil spills, pollution emissions, and compliance with environmental protection standards (Hall, 2019). Another important aspect is risk management within the shipping industry. S. K. Sharma (2018) argues that although various safety management systems are used by shipping companies, the main issue still lies with inconsistent enforcement, especially in countries with weak enforcement infrastructure. The author stresses the importance of adopting the latest technology to enhance vessel safety and provide better training for crews in emergency situations. A key finding to emphasize is the need for shipping companies to enhance their commitment to corporate social responsibility, particularly in maritime safety and environmental conservation. H. L. Baird (2020) highlights that, in addition to compliance with legal regulations, companies must also demonstrate leadership in ensuring higher safety standards. Baird found that the failure of some companies to meet these responsibilities has led to tragedies that cost lives and negatively affected the global economy.

Moreover, McGhee's (2021) findings show that many shipping companies still fail to implement effective preventive measures. McGhee found that several major tragedies in the shipping industry occurred due to neglecting strict safety procedures and a lack of accountability in safety management. These findings suggest that tighter auditing and oversight systems need to be implemented to ensure higher compliance with safety standards. Overall, the discussion that should be prioritized in this study is the responsibility of shipping companies to ensure maritime safety through effective risk management, adherence to international safety regulations, and preventive measures against pollution. The findings emphasize that stricter enforcement, the use of advanced technology, and continuous training for crew members are crucial factors in improving overall maritime safety. To illustrate the relationship between maritime safety and the responsibilities of shipping companies, I would suggest a model encompassing several key elements: risk management, legal compliance, vessel safety, and environmental protection. This model would also demonstrate the interaction between these factors in the effort to achieve sustainable maritime safety. Below is a model that illustrates the four key elements of maritime safety and the responsibilities of shipping companies.

Table 2: Model of the Four Key Elements in Maritime Safety and the Responsibilities of Shipping Companies

ELEMENT	DISCUSSION	RESPONSIBILITIES OF SHIPPING COMPANIES
Risk Management	Assessment and management of potential risks, including crew training, use of the latest safety technology, and emergency procedures.	Provide regular training for crew members, introduce the latest safety technology, and design effective emergency procedures.
Legal and Regulatory Compliance	Compliance with international maritime safety regulations, such as SOLAS, and environmental protection regulations like MARPOL.	Ensure vessels comply with international safety and environmental regulations and ensure law enforcement is carried out.
Vessel and Crew Safety	Involves ship maintenance, regular ship inspections, and crew training for handling emergencies and fires at sea.	Conduct regular ship inspections, maintain vessels properly, and implement safety training for crew members to handle emergencies.
Environmental Protection	Focus on reducing environmental impact from oil spills, harmful chemical discharges, and air pollution.	Reduce pollution by complying with MARPOL regulations and ensuring preventative measures are applied to protect the environment.

In this model, each element is interconnected. Risk management and the safety of vessels and crews are the key factors ensuring that companies comply with established legal regulations. At the same time, attention to environmental protection must also be integrated into safety management to achieve high levels of maritime safety. This model illustrates that holistic maritime safety can only be achieved when shipping companies take responsibility for all these aspects, striving to comply with the law, ensuring the safety of vessels and crews, and minimizing environmental impact. It is an effective model for

demonstrating the relationship between the key elements of maritime safety and corporate responsibility within shipping companies. Several companies have demonstrated a strong commitment to prioritizing maritime safety and their social responsibilities, setting the best examples in the industry. One notable example is Maersk Line, the world's largest shipping company, which has implemented a range of safety initiatives to ensure their vessels operate in a safe environment and comply with all international safety regulations. According to the Maersk Group Annual Report (2024), the company has invested in continuous training for its crew and integrated the latest safety technologies into their operations.

For example, Maersk has introduced a vessel monitoring system using satellite technology to provide early warnings about hazardous weather conditions or potential risks during voyages. This is one of the proactive measures that helps improve the safety of vessels and crews. Additionally, Mediterranean Shipping Company (MSC) also pays serious attention to maritime safety. MSC adheres strictly to international regulations such as SOLAS (Safety of Life at Sea) and MARPOL (International Convention for the Prevention of Pollution from Ships), aimed at protecting the environment from oil spills and greenhouse gas emissions. According to MSC's report (2023), the company regularly conducts safety inspections of its vessels and involves crew members in safety training that includes fire suppression and emergency response at sea. MSC also emphasizes environmental responsibility in their operations, implementing cleaner technologies and adhering to stringent environmental standards.

Furthermore, CMA CGM, one of the leading shipping companies, has introduced several initiatives that focus on maritime safety and environmental responsibility. In their sustainability report (CMA CGM Group, 2023), the company outlines how they utilize green technology in the operation of their vessels to reduce carbon footprints and air pollution. CMA CGM has also implemented a comprehensive safety management system, including ongoing training for their crews in handling emergency situations. One of the company's significant achievements is their success in reducing oil spills in their operations, demonstrating a strong commitment to environmental protection. Beyond these major companies, there are also efforts by authorities to improve maritime safety. The International Maritime Organization (IMO), the international body responsible for regulating global maritime safety, has introduced regulations such as the ISM Code (International Safety Management Code), which requires shipping companies to develop and implement comprehensive safety management systems. The IMO also runs campaigns such as World Maritime Day to raise awareness about maritime safety and the vital role shipping companies play in ensuring safety at sea (IMO, 2023).

Despite many good examples, industry still faces significant challenges. Issues such as negligence regarding safety, violations of environmental regulations, and ineffective risk management continue to occur in certain sectors. However, the initiatives taken by companies like Maersk, MSC, and CMA CGM demonstrate that maritime safety and corporate responsibility can be achieved with the right measures and strong commitment to responsible management. Overall, maritime safety and the responsibilities of shipping companies are aspects that should not be taken lightly. Major companies in the industry have shown that by using advanced technology, complying with international regulations, and involving crews in continuous safety training, both vessel safety and environmental protection can be achieved. These efforts not only improve maritime safety but also contribute positively to the sustainability of the planet. It is hoped that more companies will follow this lead to ensure that maritime safety and corporate responsibility continue to be enhanced in the future.

Conclusion

Maritime safety and the responsibilities of shipping companies are crucial aspects in ensuring the effectiveness and safety of global shipping services. In this increasingly complex era, shipping companies are not only responsible for the safety of their vessels and crews but also for the protection of the environment, which is increasingly threatened by maritime activities. International regulations such as SOLAS and MARPOL have set strict standards to ensure safety and environmental sustainability; however, achieving these goals requires stricter enforcement, the use of cutting-edge technology, and more effective risk management. Although much research has been conducted on maritime safety and the responsibilities of shipping companies, there are still several aspects that require further attention and investigation. In-depth studies are needed to understand the impact of new technologies in reducing accident and pollution risks, and how these technologies can be integrated into broader maritime safety management practices. Additionally, research on the enforcement of safety regulations in less developed countries and the impact of these enforcement weaknesses on global maritime safety also deserves more attention.

Research into corporate social responsibility in the maritime transport sector is also crucial to explore further. How can shipping companies enhance their commitment to environmental protection and crew safety without neglecting commercial profits? Such research will assist in shaping policies and best practices for corporate social responsibility management. Lastly, studies on the impact of climate change on maritime safety are becoming increasingly relevant. With changing weather patterns and more unpredictable sea conditions, shipping companies must be prepared to face new challenges in ensuring the safety of their operations. Research on the best ways to adapt shipping operations under the impact of climate change is essential to minimize potential losses and risks. Overall, maritime safety is an issue that should not be taken lightly. Shipping companies

must take a holistic and responsible approach to ensure safety, not only for vessels and crews but also for the environment and the global community.

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