Quality Standards For Pollution Prevention Countermeasures For Safety And Security At The Port Of Surabaya (Survey O (Survey On Tanker Ships At The Port Of Surabaya)

Dety Sutralinda

Program Pascasarjana Magister Manajemen Transportasi,Institut Transportasi dan Logistik Trisakti Jakarta, Indoneisa
*Correspondding Author:
Email: detyafiyah@gmail.com

Abstract.

The purpose of this study is to determine and analyze the activities of the shipping fleet in the use and use of aids to prevent and prevent pollution of the marine environment, the attention and willingness of officers and crew on the prevention and prevention of pollution of the marine environment, as well as strategies for handling and preventing pollution of the marine environment to support safety and shipping security. By using descriptive qualitative research, data collection is done through interviews and documentation studies to be further processed and analyzed. The results of the first analysis showed that there were still ships that were not in accordance with international standards on the means of supporting marine pollution prevention equipment and there were still crew members who were not aware of the need to prevent sea pollution. The second analysis shows that the attention and willingness of the ship's officers and crew still aboard the ship's officers who neglected the prevention of pollution by ships, not all crew members have the habit of paying attention to pollution by ships. The results of the third analysis indicate that there are still shipping companies that have not yet fully equipped the pollution prevention aids on ships, when shipping equipment is damaged it is rather difficult to provide a replacement. The results of the fourth analysis show that the strategy for preventing and preventing pollution of the marine environment to support shipping safety and security is the result of an analysis of the strengths and weaknesses as well as opportunities and threats to increase the prevention and prevention of pollution of the marine environment to support shipping safety and security.

Keywords*: Quality Standards, Tools, Pollution Prevention, Safety and Security*.

I. INTRODUCTION

Safety and security in using transportation is the main goal and thing in land transportation, air transportation and sea transportation both nationally and internationally. The safety and security of sea transportation is related to the conditions of the waters and seas used as a base for sea transportation, especially the problem of marine pollution (Hati, Setiono, and Purwiyanto 2023).Marine pollution is an event where polluting materials enter or enter from ships or from land, such as chemical particles, industrial waste, agricultural and housing waste, into the sea which can damage the marine environment. These hazardous materials have various impacts on waters because hazardous materials can have a direct or indirect impact on waters (Muna, Purwangka, and Mawardi 2021).To prevent marine pollution, efforts are needed to increase emphasis or application of regulations to all shipping companies that operate ships, including personnel who work on the ships themselves. This condition is because the sea is not only a natural resource but also a transportation infrastructure, which means that the use of the sea can be used for shipping traffic between islands, between countries and between continents, both for passenger and goods transport (Naily, Budiarto , and Adietya 2019). Therefore, all sea vessels that need to guarantee the security and safety of local and international shipping, need the support of shipping safety facilities including Marine Pollution Prevention Equipment.Auxiliary Means Marine Pollution Prevention Equipment used by ships operated by shipping companies is the main means of preventing and dealing with sea pollution, which is owned and used by all sea vessels (Achmad Syafii 2019).

Therefore, the preparation and operationalization of marine pollution prevention equipment on ships is an important effort for ships to participate in preventing sea pollution, which is caused either by activities at sea or activities on land that cause sea pollution.With large sea and coastal areas and increasingly extreme climatic conditions, shipping activities are also increasingly prone to accidents. This is a problem or challenge in the field of shipping safety. For this reason, all parties related to shipping safety need to

anticipate and be prepared for climate change and prepare adequate facilities and infrastructure to support shipping safety and security, including auxiliary equipment and equipment to prevent marine pollution.Shipping safety and security is an absolute necessity and a shared responsibility of both regulators, operators and users of maritime transportation services, including ship passengers (Mursidi 2023). The regulator in this case, the Directorate General of Sea Transportation through the Harbormaster's Office at all ports, continues to make efforts to improve shipping safety by inviting operators and stakeholders in the port environment to jointly understand the importance of shipping safety and make it a necessity, especially fulfilling aspects of shipping safety and security. in waters and oceans.Water and maritime are natural resources with great potential, as well as producers of various maritime industries such as the fishing industry, marine tourism, docking services, port services as well as mineral and energy resources. Indonesia is the largest tropical marine country in the world and has the greatest biodiversity in the sea (Muhaimin 2018). It is hoped that the potential of marine biological resources in coastal and marine areas in Indonesia can provide optimal benefits for the economic and socio-cultural development of the community.

This condition is supported in Law no. 27 of 2007 in conjunction with Law no. 1 of 2014 concerning Management of Coastal Areas and Small Islands for utilization and conservation. Therefore, its existence must be maintained and its sustainability needs to be maintained. Handling marine pollution due to uncontrolled waste disposal from maritime industrial activities and due to busy maritime transportation activities needs to be managed carefully. Marine Pollution according to Government Regulation No. 19/1999 concerning Control of Marine Pollution and/or Destruction is the entry or introduction of living creatures, substances, energy and/or other components into the marine environment by human activities so that their quality decreases to a certain level which causes the marine environment is no longer in accordance with quality standards and/or function.The problem of pollution and damage to the marine environment in Indonesia is an important issue to be addressed considering the large dependence of the Indonesian population on marine resources for survival. Increasing population demands have resulted in excessive exploitation and use of coastal and marine natural resources (Darza 2020). Apart from excessive exploitation, threats to the marine environment also come from pollution, both from land and sea, as well as utilization techniques that cause damage. Domestic and industrial liquid waste (domestic and industrial waste) is the biggest pollution problem in many places in Indonesia. This is generally caused by no or inadequate facilities to handle and manage domestic and industrial liquid waste. The high risk of oil pollution is a threat in itself to Indonesia's marine environment. This concerns offshore oil and natural gas production activities as well as shipping of ships and oil tankers which is quite busy in Indonesia.

Waste discharge from hotels and restaurants along the coast, as well as the increasing demand for clean water can pose a threat in the form of pollution and damage to the coastal environment. On the other hand, there is no or a lack of boat mooring points (pontoons) prepared in the marine natural tourism park area, causing boat anchors to have a high chance of damaging coral reefs. The pollution problem associated with agriculture is the sedimentation of pesticides and fertilizers (Nayenggita, Raharjo, and Resnawaty 2020). Rainwater flows in agricultural areas also contain large amounts of pollutants, such as nitrogen compounds which, if they reach sea waters, can cause eutrophication problems. Wrong fishing practices, using tubes, dynamite and poisonous materials, are still carried out in several areas and have caused the destruction of coral reefs and their ecosystems.In Indonesia there are regulations that specifically regulate the Control of Marine Pollution and/or Destruction, namely Government Regulation no. 19 of 1999. The existence of this Government Regulation is determined in relation to Law no. 17 of 1985 concerning Ratification of the UN Convention on the Law of the Sea, and Law Number 23 of 1997 concerning Environmental Management (Hati, Setiono, and Purwiyanto 2023).There is a legal basis for the International Convention for the Prevention of Pollution from Ships 1973/1978 (MARPOL 1973/1978). Marpol is an international regulation which aims to prevent pollution at sea. Every system and equipment on the ship that supports this regulation must receive certification from the class. The contents of the Marpol do not prohibit the disposal of polluting substances into the sea, but regulate how they are disposed of. So that with this disposal the sea is not polluted (damaged), and the marine ecosystem is maintained.

According to Niels Philipsen, and Andrea Rigamonti, (2015), marine pollution is a broad category, consisting of oil pollution (including accidents with offshore oil and gas installations) and all other marine pollution as defined, in MARPOL and the London Convention. MARPOL, the International Convention for the Prevention of Pollution from Ships, is the main international convention covering the prevention of pollution of the marine environment by ships from operational or accidental causes. The appendices list various forms of marine pollution, caused by oil, hazardous liquids, hazardous substances in the form of packaging, waste and rubbish from ships, etc.The London Convention (Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter of 1972), which came into force in 1975, aims to control marine pollution from dumping. This includes the deliberate dumping in the ocean of waste or other objects from ships, aircraft and platforms..In addition to the obvious (but difficult to measure) environmental damage caused by marine pollution, there may be health damage as well as social and financial damage (Amin et al. 2021). The two categories taken include damage to installation operators, loss of profits to the tourism sector and fishing industry, etc. The term economic damage, as in other chapters of this report, is reserved for the total of all financial and monetary impacts, but only to the extent that such information is available in existing studies or can be calculated. It should be noted that ocean pollution is not necessarily linked to crime. However, available data generally do not differentiate between intent, negligence (gross), and other causes of marine pollution (Nur 2015).Furthermore, research (Dewi 2022) found that there are three principle dimensions to the problem of marine pollution in Southeast Asia, namely the level of pollutants, the geographical distribution of pollutants, and the biological impact of pollutants on local flora and fauna.

There are large knowledge gaps for all three dimensions because most countries in the region have or release very little information on marine pollution.In connection with the international legal basis of London Dumping and Marpol above, Indonesia has regulations to overcome marine pollution caused by systems and equipment on ships as well as the disposal or burning of waste or other dangerous materials at sea, so Government Regulation Number 21 of 2010 concerning Maritime Environmental Protection. As well as Regulation of the Minister of Maritime Affairs and Fisheries Number PER.02/MEN/2011 concerning Fishing Routes and Placement of Fishing Equipment and Fishing Aids in the Fisheries Management Areas of the Republic of Indonesia and Decree of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number KEP.06/MEN/ 2010 concerning Fishing Equipment in the Fisheries Management Area of the Republic of Indonesia.The lack of public understanding of maintaining the condition of the sea is one of the problems that must be immediately addressed by the Government to explain and understand so that public awareness arises about the importance of the sea. The solution of providing a maritime curriculum for primary to secondary education is a form of understanding for the younger generation to protect marine resources and coastal areas in a good way and will foster a love of the sea.The widespread use of non-environmentally friendly fishing gear such as trawls, cantrang, and the use of explosives has resulted in environmental degradation and has had a huge impact (Hasnidar et al. 2021). The environmental damage that has occurred has eliminated the livelihoods of fishermen and fish traders.The level of pollution in several Indonesian waters is currently in an uncontrolled condition, and the rate of sedimentation entering the waters also continues to increase (Muna, Purwangka, and Mawardi 2021).

The government's efforts under the Directorate General of Sea Transportation through the Tanjung Perak Main Harbormaster's Office are activities based on checking the suitability of ships for shipping. Pollution that occurs in the marine environment will be a disaster, both now and in the future. Therefore, efforts to preserve the marine environment are a very strategic program to improve the security and safety of shipping in Indonesia so that ecological and economic losses can be reduced.The phenomenon of marine environmental pollution in general, as mentioned above, is a phenomenon that requires attention from many parties. The shipping fleet operating at sea has been equipped with tools to overcome environmental pollution and has not been fully utilized by the shipping fleet. Therefore, the phenomenon of marine environmental pollution, among other things, is the lack of optimal utilization and use of tools to overcome and prevent marine environmental pollution by shipping fleets to support shipping safety and security.

II. METHODS

The research approach used in this research is a qualitative approach. Moleong (2018) said that qualitative research is research that intends to understand phenomena about what is caused by research subjects, for example behavior, perceptions, actions and so on holistically, and by means of descriptions in the form of words and language, in a special natural context and by utilizing various scientific methods.Qualitative research is needed based on the type and background of research and relies on humans as research tools. The theme of this research is quality standards for pollution prevention tools for safety and security in shipping companies in 2018 - 2019. In a qualitative approach, researchers present the data found through a process of direct observation and interviews on board the ship and in the port. Qualitative research has studies in the form of symptoms that are related to one another in a functional relationship. The qualitative approach has the advantage that it can be intertwined between the researcher and the research subject, this cannot be found in quantitative research (Arikunto 2017). Data collection was carried out using an in-depth interview method by asking questions directly to ship crew who work on ships around the Tanjung Perak port in Surabaya.

The type of writing in research uses the descriptive type and is a case study described qualitatively. According to Morissan (2019), descriptive research is a method for researching the status of a group of people, an object, a set of conditions, a system of thought or a class in the present. Creswell (2018) added that descriptive research does not look for or explain relationships, does not test hypotheses or make predictions. The characteristics that stand out in this research are the emphasis on observation and a natural atmosphere where researchers are directly involved in the field and do not try to manipulate variables (Haryanti 2019). The researcher acts as an observer and only creates behavior categories, observes symptoms and records them in his observation book. The data collection research techniques used in the research include: Documentation. Data collection techniques are carried out by reading, taking notes, copying from books, other people's research results and downloading data from the internet that is related to this research as reference material and reference for the author. Interviews, Data collection techniques with systematic questions and answers to informants, Observations, Researchers conducted direct observations by visiting ships in the Surabaya service channel and directly seeing the process of using pollution prevention tools that were almost unsuitable for use on ships.

III. RESULTS AND DISCUSSION

General Profile of Tanjung Perak Port, Surabaya

Tanjung Perak Port is one of Indonesia's gateways to the Eastern Region, because of its very strategic role as a center for collectors and distributors of goods to the Eastern Region of Indonesia in general, and East Java Province in particular. Because of its strategic location and supported by the potential hinterland area of East Java, Tanjung Perak Port has supported local, regional and international trade flows. In the past, ocean ships unloaded and loaded their goods via barges and boats which could reach Red Bridge (the first port at that time) which was in the heart of Surabaya via the Kalimas river. Due to the development of trade traffic and the increase in the flow of goods as well as increased transportation, the dock facilities at the Red Bridge were ultimately insufficient.Then, in 1875, Ir.W. de Jongth drew up a plan to build the Port of Tanjung Perak in order to provide opportunities for ocean ships to unload and load directly without the help of barges and boats. However, this plan was later rejected because of the very high costs.Only in the first ten years of the 20th century, Ir. WB. Van Goor created a more realistic plan that emphasized the necessity for ocean liners to dock at the ship. Two experts were brought in from the Netherlands, namely Prof. DR. J Kraus and G.J de Jongth to provide advice regarding the implementation of the Tanjung Perak port development plan.After 1990, construction of Tanjung Perak Port began.

During the construction, it turned out that there were many requests to use the cade which was not yet completely finished. Thus, the expansion was carried out. Since then, Tanjung Perak Port has made a significant contribution to economic development and has an important role not only in increasing trade traffic in East Java but also throughout Eastern Indonesia.During this development period, development efforts continue to be carried out by the Port of Tanjung Perak which is directed at expanding the docks, especially container docks, expanding and improving various existing facilities, developing industrial areas in the port area, building passenger terminals and other facilities related to development of modern ports.

The facilities at Tanjung Perak Port Surabaya are clean water services, Bunkers, Jamrud Terminal, Berlian Terminal, Nilam Terminal, Mirah Terminal, Kalimas Terminal, Passenger Terminal, Ro-Ro Terminal, and Container Terminal.

Prevention of Marine Environmental Pollution

The activities of the shipping fleet in the utilization and use of aids for mitigating and preventing marine environmental pollution are the activities of the shipping fleet in the utilization and use of aids for mitigating and preventing marine environmental pollution to support shipping safety and security. Therefore, support for shipping safety and security is the focus of deepening the activities of shipping fleets in the utilization and use of tools to overcome and prevent pollution of the marine environment.

Topics and factual conditions of shipping fleet activities in the utilization and use of tools to overcome and prevent environmental pollution. The factual conditions of the shipping fleet's activities in the utilization and use of tools to overcome and prevent environmental pollution, respectively, are:.

Shipping Fleet Activities in the Utilization and Use of Mitigation Tools and There are still ships that do not comply with international standards regarding marine pollution prevention tools and equipment.

1. There are still ship crews who are not aware of the need to prevent marine pollution
2. The use and use of auxiliary equipment to prevent marine pollution is determined by the ship's captain
3. The use and use of marine pollution prevention equipment is carried out by the ship's crew
4. Shipping companies prepare equipment to prevent pollution by ships
5. Harbormaster tries to provide training to shipping companies and ship crews
6. There is negligence and neglect by the port management or harbormaster towards ships who ignore pollution by ships
7. Harbormaster checks every ship that will enter the port
8. The company provides ship alarm equipment to prevent pollution by ships
9. Must involve all crew members as executors of preventing pollution by ships
10. The shipping fleet uses tools provided by shipping companies
11. Many plans must be made for ship safety, including pollution prevention.

By observing and focusing on the factual conditions of the shipping fleet's activities in the utilization and use of aids for mitigating and preventing marine environmental pollution, we can identify factual conditions that support and factual conditions that hinder the activities of the shipping fleet in utilizing and using aids for mitigating and preventing marine environmental pollution. to support shipping safety and security.By accumulating the overall reflection of the factual conditions of shipping fleet activities in the utilization and use of tools for mitigating and preventing marine environmental pollution to support shipping safety and security, and the impact of factual conditions on the activities of shipping fleets in utilizing and using aids for mitigating and preventing marine environmental pollution to support shipping safety and security, then the factual conditions and the impact of factual conditions on the activities of the shipping fleet in the utilization and use of tools for mitigating and preventing marine environmental pollution to support shipping safety and security are as shown in the following table.

Table 1. Factual Conditions and Impact of Factual Conditions on Shipping Fleet Activities in the Utilization and Use of Tools for Mitigating and Preventing Marine Environmental Pollution.

No	Factual Condition	The impact of Factual Condition
1	There are still ships that do not comply with international standards regarding marine pollution prevention equipment	Shipping fleet activities that do not support shipping safety and security
2	There are still ship crews who are not aware of the need to prevent marine pollution	Shipping fleet activities that do not support shipping safety and security
3	The use and use of marine pollution prevention equipment is determined by the ship's captain	Shipping fleet activities that support shipping safety and security
4	The use and use of auxiliary equipment to prevent marine pollution is carried out by the ship's crew	Shipping fleet activities that support shipping safety and security
5	Shipping companies prepare equipment to prevent pollution by ships	Shipping fleet activities that support shipping safety and security

No	Factual Condition	The impact of Factual Condition
6	The Harbormaster tries to provide training to shipping companies and ship crews	Shipping fleet activities that support shipping safety and security
7	There is negligence and neglect by the port management or harbormaster regarding ships who are ignorant of pollution by ships	Shipping fleet activities that support shipping safety and security
8	The harbormaster checks every ship that will enter the port	Shipping fleet activities that support shipping safety and security
9	The company provides ship alarm equipment to prevent pollution by ships	Shipping fleet activities that support shipping safety and security
10	Must involve all crew members as executors of prevention of pollution by ships	Shipping fleet activities that support shipping safety and security
11	The shipping fleet only uses tools provided by the shipping company	Shipping fleet activities that do not support shipping safety and security
12	Many plans must be made for ship safety, including pollution prevention	Shipping fleet activities that do not support shipping safety and security

Based on the table above, it can be stated that the activities of the shipping fleet in the utilization and use of tools to overcome and prevent pollution of the marine environment consist of activities that support and activities that do not support shipping safety and security. The activities of the shipping fleet in the utilization and use of tools to control and prevent pollution of the marine environment which do not support the safety and security of shipping are that there are still ships that do not comply with international standards regarding tools to help prevent marine pollution, there are still crew members who are not yet aware of the need for prevention. marine pollution, there is negligence and neglect by port managers or ship harbormasters who ignore pollution by ships, shipping fleets use tools provided by shipping companies, many plans must be made for ship safety including pollution prevention. Meanwhile, the activities of the shipping fleet in the utilization and use of tools to control and prevent pollution of the marine environment that support shipping safety and security are the use and utilization of auxiliary equipment for preventing marine pollution determined by the ship's captain, the use and utilization of auxiliary equipment for preventing marine pollution is carried out by the ship's crew. , the shipping company prepares equipment to prevent pollution by ships, the harbormaster tries to provide training to shipping companies and ship crews, the harbormaster checks every ship that will enter the port, the company provides ship alarm equipment to prevent pollution by ships and involves all crew members as executors of pollution prevention by ship.

Attention and Willingness of Officers and Ship Crews to Overcome and Prevent Marine Environmental Pollution

The factual conditions regarding the attention and willingness of ship officers and crew towards overcoming and preventing pollution of the marine environment, respectively, are 1) There are still ship officers who ignore the prevention of pollution by ships, 2) There are still crew members who do not pay attention to the possibility of pollution by ship activities, 3) Remind all crew members to pay attention to pollution prevention facilities, 4) Too much exercise on the ship will result in crew fatigue, 5) Try to follow international standards regarding pollution prevention by ships, 6) Provision of pollution prevention aids prepared by the shipping company, 7) Make efforts carry out training to prevent pollution by ships, 8) Most likely there will be additional training for shipping safety, 9) There are some officers who do not understand how to use aids to prevent pollution by ships, 10) Not all crew members have the habit of paying attention to pollution by ships, 11) Periodically carry out ship safety and security checks, 12) Ensure ship safety and security procedures are maintained.By accumulating the overall reflection of the factual conditions of attention and will of ship's officers and crew towards overcoming and preventing pollution of the marine environment, and the impact of factual conditions on the attention and will of officers and crew towards overcoming and preventing pollution of the marine environment, then the factual conditions and the impact of factual conditions on attention and the willingness of ship officers and crew to overcome and prevent marine environmental pollution. are as shown in the following table.

Table 2. Factual Conditions and Impact of Factual Conditions Attention and Willingness of Ship Officers and Crews towards Overcoming and Preventing Marine Environmental Pollution

No	Factual Condition	The Impact of Factual Conditionl
1	There are still ship officers who neglect preventing pollution by ships	The attention and willingness of the ship's officers and crew does not support shipping safety and security.
2	There are still crew members who have not paid attention to the possibility of pollution by ship activities	The attention and willingness of the ship's officers and crew does not support shipping safety and security
3	Remind all crew members to pay attention to pollution prevention means	The attention and willingness of ship officers and crew to support shipping safety and security
4	Banyaknya latihan di kapal akan mengakibatkan kelelahan abk	The attention and willingness of the ship's officers and crew does not support shipping safety and security
5	Strive to follow international standards regarding the prevention of pollution by ships	. The attention and willingness of ship officers and crew to support shipping safety and security
6	Provision of means to help prevent pollution is prepared by shipping companies	The attention and willingness of ship officers and crew to support shipping safety and security
7	Trying to carry out training to prevent pollution by ships	The attention and willingness of ship officers and crew to support shipping safety and security
8	Most likely there will be additional training for shipping safety	The attention and willingness of ship officers and crew to support shipping safety and security
9	There are some officers who do not understand how to use pollution prevention equipment on ships	The attention and willingness of the ship's officers and crew does not support shipping safety and security
10	Not all crew members have the habit of paying attention to pollution by ships	The attention and willingness of the ship's officers and crew does not support shipping safety and security.
11	Periodically carry out ship safety and security checks	The attention and willingness of ship officers and crew to support shipping safety and security
12	Ensure that ship safety and security procedures are maintained	The attention and willingness of ship officers and crew to support shipping safety and security

Based on the table above, it can be stated that the attention and willingness of ship officers and crew towards overcoming and preventing marine environmental pollution is the attention and willingness that supports and does not support shipping safety and security. The attention and willingness of ship officers and crew towards overcoming and preventing pollution of the marine environment which does not support the safety and security of shipping is that there are still ship officers who ignore the prevention of pollution by ships, there are still crew members who do not pay attention to the possibility of pollution by ship activities, the amount of training on ships will result in crew fatigue, there are some officers who do not understand how to use tools to prevent pollution by ships, not all crew members have the habit of paying attention to pollution by ships.Meanwhile, the attention and willingness of ship officers and crew towards overcoming and preventing pollution of the marine environment which does not support the safety and security of shipping is to remind all crew members to pay attention to means of preventing pollution, trying to follow international standards regarding preventing pollution by ships, providing auxiliary means of preventing pollution prepared by Shipping companies are trying to carry out training to prevent pollution by ships, most likely there will be additional training for shipping safety, periodically carrying out ship safety and security checks and ensuring ship safety and security procedures are maintained.

Shipping Companies' Attention to Preparing to Mitigate and Prevent Marine Environmental Pollution by Shipping Fleets

As mentioned in the previous section, the topics and factual conditions of attention of shipping companies to prepare to overcome and prevent pollution of the marine environment by shipping fleets are known. The factual conditions of attention of shipping companies to prepare to overcome and prevent pollution of the marine environment by shipping fleets, respectively, are 1) Not all ship crews understand the importance of pollution prevention training expected by shipping companies, 2) Limited means of helping to overcome pollution available on ships, 3) Companies place more emphasis on ship crews to use and maintain pollution prevention and control tools, 4) There are still shipping companies that have not fully equipped pollution control tools on ships, 5) Shipping companies must be ready to follow international standards for

pollution control tools on the ship, 6) Equipment equipment is the duty of the shipping company, 7) Inspecting the use of pollution control equipment on the ship, 8) When the prevention equipment is damaged, the shipping company finds it rather difficult to provide a replacement.By observing and focusing on the factual conditions of shipping companies' attention to preparing to overcome and prevent pollution of the marine environment by shipping fleets to support shipping safety and security, we can find out the factual conditions that support and the factual conditions that hinder the attention of shipping companies to prepare to overcome and prevent environmental pollution. sea by the shipping fleet to support shipping safety and security.By accumulating the overall reflection of the factual conditions of attention of shipping companies to prepare to overcome and prevent pollution of the marine environment by shipping fleets to support shipping safety and security, and the impact of factual conditions from the attention of shipping companies to prepare to overcome and prevent pollution of the marine environment by shipping fleets to support safety and shipping safety, then the factual conditions and the impact of factual conditions on the attention of shipping companies to prepare to overcome and prevent pollution of the marine environment by shipping fleets to support shipping safety and security are as shown in the following table.

Table 3. Factual Conditions and Impact of Factual Conditions Attention to Shipping Companies in Preparing to Mitigate and Prevent Marine Environmental Pollution by Shipping Fleets.

No	Factual Condition	The impact of factual condition
1	Not all ship crew members understand the importance of pollution control training expected by shipping companies.	Attention of shipping companies that support shipping safety and security.
2	Limited means of pollution control available on ships	Attention shipping companies that do not support shipping safety and security.
3	The company places greater emphasis on ship crews to use and maintain pollution prevention and control equipment.	Attention of shipping companies that support shipping safety and security.
4	There are still shipping companies that have not fully equipped the means to help control pollution on their ships.	Attention shipping companies that do not support shipping safety and security.
5	Shipping companies must be prepared to follow international standards for means of controlling pollution on ships.	Attention of shipping companies that support shipping safety and security.
6	Completeness of the facilities is the responsibility of the shipping company.	Attention of shipping companies that support shipping safety and security.
7	Carry out inspections on the use of pollution control equipment on ships.	Attention of shipping companies that support shipping safety and security.
8	When the preventive device is damaged, shipping companies find it rather difficult to provide a replacement.	Attention shipping companies that do not support shipping safety and security

Based on the table above, it can be stated that the attention of shipping companies to prepare to overcome and prevent pollution of the marine environment by shipping fleets consists of the attention of shipping companies that support and do not support shipping safety and security. The attention of shipping companies to prepare to overcome and prevent pollution of the marine environment by shipping fleets that do not support the safety and security of shipping is due to the limited means of pollution control measures available on ships, there are still shipping companies that have not fully equipped the means of aids to control pollution on ships, when prevention tools If it is damaged, the shipping company will find it rather difficult to provide a replacement. Meanwhile, the attention of shipping companies to prepare for handling and preventing pollution of the marine environment by shipping fleets which supports shipping safety and security is that not all ship crew understand the importance of pollution control training expected by shipping companies, companies place more emphasis on ship crew to use and maintain prevention tools and equipment. In dealing with pollution, shipping companies must be ready to follow international standards for pollution prevention aids on ships, the completeness of the facilities is the duty of shipping companies, to carry out inspections on the use of pollution prevention aids on ships.

Marine Environmental Pollution Management and Prevention Strategy to Support Shipping Safety and Security

The accumulation of all analysis results which are referred to as strengths, weaknesses, opportunities and threats towards increasing control and prevention of marine environmental pollution to support shipping

safety and security is the main material for discussing strategies for handling and preventing marine environmental pollution to support shipping safety and security. Therefore, a discussion of strategies for mitigating and preventing marine environmental pollution to support shipping safety and security is a discussion of the results of the analysis which are referred to as strengths, weaknesses, opportunities and threats to improve mitigating and preventing marine environmental pollution to support shipping safety and security.By observing all the results of the previous analysis and carrying out integration and adjustments as necessary, the overall results of the analysis and the form of analysis results as strengths and weaknesses as well as opportunities and threats in improving the control and prevention of marine environmental pollution to support shipping safety and security, are as shown in the following table This.Table 4 Strengths and Weaknesses as well as Opportunities and Threats in Improving Management and Prevention of Marine Environmental Pollution to Support Shipping Safety and Security.

No	Hasil Analisis	Bentuk Hasil Analisis
1	The use and utilization of marine pollution prevention equipment is determined by the ship's captain and implemented by the ship's crew,	Strength in improving control and prevention of marine environmental pollution
2	Shipping companies prepare equipment to prevent pollution by ships	Strength in improving control and prevention of marine environmental pollution
3	Remind all crew members to pay attention to pollution prevention means	Strength in improving control and prevention of marine environmental pollution
4	Provision of means to help prevent pollution is prepared by shipping companies	Strength in improving control and prevention of marine environmental pollution
5	Shipping companies hope that all crew members understand the importance of pollution control training	Strength in improving control and prevention of marine environmental pollution
6	The readiness of shipping companies to follow international standards for aids in dealing with pollution on ships	Strength in improving control and prevention of marine environmental pollution
7	There are still ships that do not comply with international standards regarding marine pollution prevention equipment.	Weaknesses in improving control and prevention of marine environmental pollution
8	Many plans must be made for ship safety, including pollution prevention.	Weaknesses in improving control and prevention of marine environmental pollution
9	There are still ship officers who neglect preventing pollution by ships	Weaknesses in improving control and prevention of marine environmental pollution
10	There are still crew members who have not paid attention to the possibility of pollution by ship activities	Weaknesses in improving control and prevention of marine environmental pollution
11	A lot of training on the ship will result in crew fatigue	Weaknesses in improving control and prevention of marine environmental pollution
12	There are still shipping companies that have not fully equipped the means to help control pollution on their ships	Weaknesses in improving control and prevention of marine environmental pollution
13	The Harbormaster tries to provide training to shipping companies and ship crews.	Opportunities for improving control and prevention of marine environmental pollution
14	The harbormaster checks every ship that will enter the port The company provides ship alarm equipment to prevent pollution by ships	Opportunities for improving control and prevention of marine environmental pollution
15	The harbormaster checks every ship that will enter the port The company provides ship alarm quipment to prevent pollution by ships	Opportunities for improving control and prevention of marine environmental pollution
16	Involvement of all crew as executors of prevention of pollution by ships.	Opportunities for improving control and prevention of marine environmental pollution
17	Most likely there will be additional training for shipping safety	Opportunities for improving control and prevention of marine environmental pollution
18	The harbor master inspects the use of pollution control equipment on the ship.	Opportunities for improving control and prevention of marine environmental pollution
19	There are still ship crews who are not aware of the need to prevent marine pollution	Threats in improving control and prevention of marine environmental pollution
20	There is negligence and neglect by the port	Threats in improving control and prevention of

No	Hasil Analisis	Bentuk Hasil Analisis
	management or harbormaster regarding ships who are ignorant of pollution by ships	marine environmental pollution
21	There are some officers who do not understand how to use pollution prevention equipment on ships	Threats in improving control and prevention of marine environmental pollution
22	Not all crew members have the habit of paying attention to pollution by ships	Threats in improving control and prevention of marine environmental pollution
23	When the preventive device is damaged, shipping companies find it rather difficult to provide a replacement	Threats in improving control and prevention of marine environmental pollution

By using the form of analysis results as strengths and weaknesses as well as opportunities and threats in improving control and prevention of marine environmental pollution to support shipping safety and security, the matrix analyzes strengths and weaknesses as well as opportunities and threats in improving control and prevention of marine environmental pollution to support safety and Shipping security is as in the table below.

Table 3. Matrix Analysis of Strengths and Weaknesses as well as Opportunities and Threats in Improving Management and Prevention of Marine Environmental Pollution to Support Shipping Safety and Security

EFAS / IFAS	**(Strength)**	**(Weakness)**
	1. 1. The use and use of auxiliary equipment to prevent marine pollution is determined by the ship's captain, and implemented by the ship's crew, 2. Shipping companies prepare equipment to prevent pollution by ships 3. Remind all crew members to pay attention to pollution prevention facilities 4. Provision of means to help prevent pollution is prepared by the shipping company Shipping companies hope that all crew members understand the importance of pollution control training 5. The readiness of shipping companies to follow international standards for aids in dealing with pollution on ships	1. There are still ships that do not comply with international standards regarding marine pollution prevention equipment 2. Many plans must be made for ship safety, including pollution prevention. 3. There are still ship officers who ignore the prevention of pollution by ships 4. There are still crew members who have not paid attention to the possibility of pollution by ship activities 5. A lot of training on the ship will result in crew fatigue There are still shipping companies that have not fully equipped the means to help control pollution on their ships
(Opportunity)	**Strategy SO**	**Strategy WO**
1. 1. Harbormaster tries to provide training to shipping companies and ship crews. 2. . Harbormaster checks every ship that will enter the port 3. The company provides ship alarm equipment to prevent pollution by ships 4. Involvement of all crew members as executors of prevention of pollution by ships. 5. Most likely there will be	a. Checking the readiness of pollution prevention tools implemented by shipping companies. b. Prepare rewards and punishments for ships that carry out marine pollution prevention activities by the Harbor Master. c. Developing a socialization program to prevent marine pollution by ships for ship officers and crew as well as shipping companies.	a. Prepare an evaluation program for the provision of tools to prevent marine pollution by ships according to international standards. b. Intensify the habit of using pollution prevention tools by ship crew through regular training.

additional training for shipping safety 6. The harbor master inspects the use of pollution control equipment on the ship.		
(Threats)	**Strategy ST**	**Strategy WT**
1. . There are still ship crews who are not aware of the need to prevent marine pollution 2. 2. There is negligence and neglect by the port management or harbormaster towards ships who ignore pollution by ships 3. 3. There are some officers who do not understand how to use pollution prevention equipment on ships 4. 4. Not all crew members have the habit of paying attention to pollution by ships 5. When the preventive device is damaged, shipping companies find it rather difficult to provide a replacement	a. a. Assessing the crew's understanding of preventing marine pollution by ships. b. b. Providing a detection program for ships to prevent pollution by ships by the Harbormaster. c. Carry out on-the-job training for ship crews on preventing marine pollution by ships.	a. Providing direction to shipping companies to prioritize the completeness of pollution prevention equipment on ships by the Harbor Master. b. b. Intensify the Harbormaster's activities in supervising the prevention of marine pollution by ships.

By looking at the results of the SWOT analysis above, it can be said that the strategy to improve management and prevent pollution of the marine environment will support ship safety and security is the result of an assessment of strengths, weaknesses and opportunities. and threats. in improving control and prevention of marine environmental pollution to support safety and security. However, the overall strategy to improve control and prevention of marine environmental pollution supports the safety and security of every vessel:

1. Check the efficiency of anti-pollution equipment implemented by shipping companies.
2. Prepare fines and penalties for ships carrying out storm prevention activities by the Harbormaster.
3. Develop an educational program to prevent marine pollution by ships for officers, sailors and ship crew.
4. Develop an evaluation program for the provision of marine pollution prevention equipment by ships according to international standards.
5. Encourage the routine use of pollution prevention equipment by seafarers through regular training.
6. Assess seafarers' knowledge about preventing marine pollution by ships.
7. Providing awareness programs for ships to prevent pollution by ships by the Harbormaster.
8. Make the work of sailors easier to prevent marine pollution by ships.
9. Give instructions to shipping companies to install complete anti-pollution equipment on board ships by the Harbor Master.
10. Strengthen Port Authority efforts to prevent marine pollution by ships.

By paying attention to the overall strategy for increasing the control and prevention of marine environmental pollution to support shipping safety and security as above, it can be seen that the strategy in question requires synergistic and integrated implementation by the harbormaster, shipping companies and ship officers and crew. Thus, harbormasters, shipping companies as well as ship officers and crew are the parties who directly implement strategies to increase the control and prevention of marine environmental pollution to support shipping safety and security in a synergistic and integrated manner.

IV. CONCLUSION

By paying attention to the entire manuscript including the results of research and discussions that have been carried out, the following conclusions can be drawn:

1. The activities of the shipping fleet in the utilization and use of tools to overcome and prevent pollution of the marine environment consist of activities that support and activities that do not support shipping safety and security. Shipping fleet activities that do not support shipping safety and security are that there are still ships that do not comply with international standards regarding supporting equipment and equipment for preventing marine pollution, there are still ship crews who are not yet aware of the need to prevent marine pollution, there is negligence and neglect by the port management or harbormasters for ships that ignore pollution by ships, shipping fleets use tools provided by shipping companies, many plans must be made for ship safety, including pollution prevention.

2. The attention and willingness of ship officers and crew towards overcoming and preventing pollution of the marine environment is the attention and willingness that supports and does not support shipping safety and security. The attention and willingness of ship officers and crew towards overcoming and preventing pollution of the marine environment which does not support the safety and security of shipping is that there are still ship officers who ignore the prevention of pollution by ships, there are still crew members who do not pay attention to the possibility of pollution by ship activities, the amount of training on ships will result in crew fatigue, there are some officers who do not understand how to use tools to prevent pollution by ships, not all crew members have the habit of paying attention to pollution by ships.

3. The attention of shipping companies to prepare to overcome and prevent pollution of the marine environment by shipping fleets consists of the attention of shipping companies that support and do not support shipping safety and security. The concern of shipping companies that do not support shipping safety and security is the limited means of pollution prevention tools available on ships, there are still shipping companies that have not fully equipped the pollution control tools on ships, when the prevention tools are damaged shipping companies find it rather difficult to provide replacements.

4. The strategy for improving control and prevention of marine environmental pollution to support shipping safety and security is the result of an analysis of strengths and weaknesses as well as opportunities and threats in improving control and prevention of marine environmental pollution to support shipping safety and security.

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