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WORLD MARITIME UNIVERSITY

Dalian, China

**RESEARCH ON LEGAL PROBLEMS IN AND
COUNTERMEASURES FOR PREVENTION AND
CONTROL MARINE ENVIRONMENT
POLLUTION BY SHIPS**

By

W2004990

The People's Republic of China

A dissertation submitted to the World Maritime University in partial
Fulfillment of the requirements for the award of the degree of

MASTER OF SCIENCE

In

MARITIME AFFAIRS

(MARITIME SAFETY AND ENVIRONMENT MANAGEMENT)

2021

DECLARATION

I certify that all the materials in this dissertation that are not my own work have been identified and that no material is included for which a degree has previously been conferred on me.

(Signature):

(Date):

Supervised by:

Professor

Dalian Maritime University

Assessor: _____

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ABSTRACT

Title of Research paper: **Research on Legal Problems in and Countermeasures for Prevention and Control Marine Environment Pollution by Ships**

Degree: **MSc**

At present, China's legal system for the prevention and control of ship pollution to the marine environment is not robust, and the fields involved are limited to a certain extent. Although some experts and scholars have done some research on ship pollution damage, most of them are only related to the prevention and compensation of ship oil pollution damage, while little has been done in other aspects of ship pollution to the marine environment.

In this paper, the problems of marine environment pollution in the process of shipping and production operation in China, as well as the legal issues of prevention and control of such pollution are studied. Based on analysis to existing Chinese national laws and regulations, departmental rules and policies related to the prevention and control of ship pollution, by learning from the relevant experience and measures at home and abroad, this paper puts forward some countermeasures and suggestions for improving the existing legal system.

KEYWORDS: Prevention and control, Ship pollution, Oil pollution damage, Compensation mechanism

RESEARCH ON LEGAL PROBLEMS AND COUNTERMEASURES OF PREVENTING AND CONTROLLING MARINE ENVIRONMENT POLLUTION BY SHIPS

This paper is divided into six parts.

Chapter 1: Introduction. This part mainly expounds on the background of ship pollution, the current situation of research on this issue at home and abroad, the main purpose and significance of the study, and paves the way for the legal research on the prevention and control of marine environment pollution by ships in the future.

Chapter 2: The overview of marine environment pollution, including the concept, types, harm caused by marine pollution and the current situation of marine environment pollution by ships in China.

Chapter 3: The current legislation of prevention and control of marine environment pollution by ships in China. This part mainly analyzes the current laws, regulations, departmental rules and regulations on the prevention and control of ship pollution in China. Then, the paper expounds on the legal issues of prevention and control of ship pollution in China, and focuses on the legislation, law enforcement, responsibility and supervision of the government.

Chapter 4: The existing problems of the current legal system in China. The current legal system deals mainly with the problems of the anti pollution laws and regulations and is far from “perfect”, and there are also defects in the process of law enforcement, that is, the main problem lies in legislation and law enforcement.

Chapter 5: The legal reference of prevention and control of marine environment pollution by ships. This part introduces some international conventions on preventing and controlling marine environment pollution by ships, then makes analysis to the legislation and practices of some foreign countries which have well-established legal systems and laws on marine environment pollution control. Taking the experience of some advanced countries in the prevention and control of ship pollution as the key research object, this paper provides some references for the Research on the legal issues of marine environment pollution by ships in China (crook, John R, 2010) 。

Chapter 6: The countermeasures for improvement of the legal system of marine environment pollution prevention and control in China. This part, by drawing on the advanced legal experience of prevention and control of marine environment pollution by ships, the paper puts forward the idea of improving the legal system of prevention and control of marine environment pollution by ships in China, with the hope to provide references for the legal departments on bettering the the legislation, law enforcement, responsibility and supervision practices.

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CHAPTER 1 INTRODUCTION

1.1 Research background

The ocean is the cradle of life, about 70% of the surface area of the earth is surrounded by the sea. The ocean has the effect of regulating global climate and promoting and improving ecological balance, which is the basis for all living beings to survive. There are abundant material resources in the ocean, including huge animal and plant resources, mineral resources and resources buried in the sea floor. Therefore, human survival and development cannot be separated from the sea (Li, 2012). However, with the rapid development of modern global trade, the maritime shipping industry has entered a period of vigorous development. Compared with other modes of transportation, ocean transportation costs very low, only about 50% of the cost by the railway transportation. At present, about 80% of the world's commercial cargo is transported by ships, but with the frequent transportation of ships, the pollution risk brought about by the ship is also increasing. The leakage and discharge of oil & its refining products and toxic & harmful chemical products carried by ships seriously pollute the marine ecological environment. The domestic sewage, domestic garbage, pollutants carried by the ship and the primer of the ship also cause serious damage to the marine environment. Therefore, it is of great significance to prevent and control marine pollution by ships and protect the marine ecological environment for the healthy and sustainable development of global economy, for human survival and for the establishment of an environment-friendly society (Buono Andrea, Li Yu, PAEs Rafael Lemos, 2021).

1.2 Research status at home and abroad

At present, China's legal system for the prevention and control of marine environment pollution by ships is far from well established imperfect, and research in the field is quite limited. Although some experts and scholars have done some research on ship pollution damage, most of them are only involved in the prevention and compensation of marine pollution damage, and little is done in other aspects of marine environment pollution by ships (Liu, 2016). In conclusion, most of the research done by Chinese scholars are mainly focused on the ship oil pollution damage, but the harm, liability division and compensation system on ship pollution damage, as well as other aspects of the damage, such as domestic sewage, domestic garbage and the transportation of toxic substances, are rarely involved. Therefore, considering this situation, the paper studies China's legal issues concerning prevention and control of marine environment pollution caused by ships in China, finds out the problems existing in prevention and treatment of marine pollution in the process of legislation and law enforcement, and puts forward suggestions for improving legal practices, which is an important topic for promoting the economic development and promoting marine sustainability in China (Huang, 2011). Different from the current focus on the damage of marine oil pollution in China, the legal research on marine environment pollution by ships in some foreign countries is very extensive. In practice, most developed countries have joined the International Convention and improved the legal system on preventing and controlling ship pollution coexisting in domestic legislation (Yu, 2020).

1.3 Main purpose and significance of the study

At present, the coastal environmental pollution is becoming increasingly serious, which seriously threatens the life and health of the people in the coastal area and the economic development. Therefore, prevention and control of ship pollution and improvement of the deteriorating marine environment have become the top priority (SciTech book news, 2009). According to the current situation and characteristics of ship pollution prevention and control, the core of prevention and control of marine environment is to improve the legal system in line with the national conditions (he, 2010). This paper will start from the current legal problems of prevention and control of marine environment pollution by ships in China, and analyze the legal system on preventing and controlling of ship pollution, and find out that there are a series of problems in China, such as unclear law enforcement subject, compensation mechanism for pollution damage, lack of necessary emergency response schemes, and not very good compensation system for oil spill pollution accidents (Wang, 2010). Therefore, at present, China urgently needs to increase the relevant laws and regulations on oil pollution, ballast water pollution and toxic and harmful substances pollution. We need to learn from advanced management experience of developed countries, and to establish professional law enforcement team & efficient comprehensive management mode (Ji, 2015). Beside, we need to establish professional emergency response team, and to set up special emergency office. In the aspect of compensation for ship pollution damage, we need to improve the compensation mechanism of ship pollution damage in China.

1.4 Main contents of the project

The problems of pollution of marine environment in the process of ship transportation and production in China and the legal problems of prevention and control of such pollution are studied (Sheppard Charles, Elliott Michael, Galgani Francois, Hutchings pat, Morton Brian, Richardson Bruce, Yang Gui Peng, 2021). According to the existing national laws & regulations and local laws & regulations related to the prevention and control of ship pollution, the author puts forward some suggestions for China's existing legal system by learning from the good measures and advanced legal systems from those experienced countries in the way of preventing and controlling marine environment caused by ships.

CHAPTER 2 OVERVIEW OF MARINE ENVIRONMENT POLLUTION BY SHIPS

2.1 Concept of ship pollution

At present, there is no clear definition of ship pollution in China. Some scholars believe that ship pollution refers to the environmental pollution caused by all kinds of vessels except fixed and mobile platforms in the process of offshore oil exploration. Some scholars also define ship pollution as the emission of pollutants discharged by ships in the sea, which can damage marine biological resources, harm human health, hinder fishery and other marine economic activities. The damage to the quality of seawater and the destruction to the environment have resulted in the destruction of marine ecosystem balance (J. w. oloniecki, 1986). In my opinion, ship pollution refers to all direct or indirect emission pollution behaviors that harm human health and marine ecological environment caused by the marine production and operation. According to the causes of ship pollution, it can be divided into accident ship pollution and emission ship pollution (Chen, 2010). With the rapid development of Global trade, maritime transportation has become the most economical and the most important mode of transportation. With the increase of the number of ships, the trend of large-scale ships is becoming more and more serious for the marine environment pollution.

2.2 Types of ship pollution

2.2.1 Oil pollution

Oil pollution refers to the marine environmental pollution caused by and related to oil products, which mainly includes accident oil spillage and operational oil spill. Accidental oil spillage refers to the behavior of fuel spillage and pollution to the marine environment caused by ship grounding, fire, collision, explosion, and other marine accidents (mugilarasan M., Karthik R., purvaja R., Robin R.S., subbaredy B., Hariharan g., Rohan S., jinoj t.p.s., anandavelu I., pugalenti P., Ramesh, 2021). Since 1993, China has changed from an oil exporting country to an oil importing country. The number of oil imports has increased year by year. The oil volume relying on sea transportation is increasing. 90% of the imported oil is carried by sea ship transportation. The huge increase of oil import makes the navigation environment which has already been very complex becomes more severe, which leads to oil pollution of ships, especially, the risk of oil spill pollution of large ships is increased (Meng, 2020).

2.2.2 Pollution of toxic and harmful substances

The damage caused by packaging and cargo tank leakage is very likely to occur in the process of shipping of toxic and harmful substances. Most of the toxic and harmful substances are more harmful than oil. If a large number of toxic goods are discharged into the sea in the average accident, it will cause

serious pollution disasters to the marine environment and marine organisms.

2.2.3 Pollution of sewage of ships

Domestic sewage of ships refers to the wastewater and waste produced by the daily life of the crew, passengers and animals on board. The scope of domestic sewage on board the ship is very wide, including toilets, kitchens, laundry rooms, activity rooms and other places. As the domestic sewage of the ship contains not only organic substances and minerals, It also contains rich oxygen-containing organic matter and various pathogenic microorganisms and parasites, which can make the water quality worse, cause fish and many marine organisms to die, and the rich nutrition elements in the domestic sewage will promote the eutrophication of water body and cause red tides.

2.2.4 Pollution of ballast water

Because the ship needs ballast water to keep it balanced when sailing without load, the ballast water will be discharged into the sea area of port country when the ship arrives at the shore. Thus, ballast water becomes the chief way of the transfer of harmful organisms in the oceans. With the ship ballast water spreading around the world, once the alien marine organisms invade into the new suitable living areas, it will not only induce red tides, it will also breed in large quantities and plunder the food of local organisms, which will cause the

rapid spread of harmful parasites and pathogens, and even cause extinction of local species, which will seriously destroy the structure and function of marine biological system (Wang, 2020).

2.3 Harm of marine environment caused by ship pollution

2.3.1 Huge economic losses

The direct loss of wealth caused by ship pollution is very huge, and the cost of later treatment is also very amazing.“ The Canyon oil tanker ran aground off the southwest coast of England, causing 120000 tons of crude oil spills. The most serious oil leakage occurred at that time. Because the captain chose a relatively large number of reefs and chaos in using autopilot, the tanker hit the reef at full speed. The British government detonated 40000 tons of crude oil left in the hull by air bombing, which polluted a large area of the sea area along the British and French coasts, and caused unprecedented serious oil pollution events (Jiang Shan Shan, Li Jin Mei, 2021).

2.3.2 Damage to marine ecological environment and ecological balance

The separation of sea water from sunlight caused by ship pollution seriously affects photosynthesis of marine plants, and also seriously harms the production capacity of fish, shellfish and other marine organisms (Chen, 2020) heavy metals, toxic organic compounds and other toxic substances in the marine pollution sources are accumulating through marine biological enrichment, which will cause toxicity to marine animals eating this, and thus threaten human health. The air outside is difficult to enter the sea water because the leaked oil forms a large oil film on the surface of the sea, This

prevents oxygen from dissolving into the sea water, causing the lack of oxygen elements in the sea water, and it is very easy to cause the anoxic death of marine life.

2.3.3 Harm to human life and health

The pollution of ships will make the water quality drop, and a large number of toxic and harmful bacteria will be bred in the sea water. Marine life is difficult to survive in such an environment. In the polluted water areas, carcinogens in marine organisms will also rise significantly. This factor will eventually accumulate into the human body through the transmission of food chain while poisoning the marine organisms, and ultimately, it will threaten human health (Gao, 2020).

2.4 Current situation of marine environment pollution by ships in China

As an important branch of marine environmental pollution, ship pollution not only pollutes the sea area, but also causes a large number of extinction and poisoning of marine life, which seriously affects the development of tourism in polluted sea areas in coastal countries (Pergamon, 1974), which has caused a large number of industry failures, and the rapid increase of the number of unemployed people in a short period, not only has caused great material wealth loss, it also brings uncertainty to the harmonious stability of coastal society and can cause immeasurable potential damage to human health through the cumulative effect of food chain (Pergamon, 1976).

The oil pollution of ships is the most serious type of marine pollution, the highest risk and the most serious one among all forms of marine environmental pollution. With the rapid development of economic construction, the demand for oil is increasing year by year. The annual oil import reaches more than 100 million tons, and most of them are completed by sea transportation, accompanied by frequent marine transportation, the risk of oil spill accidents is also increasing gradually. According to the survey results of the Maritime Department of China, Bohai Bay, Yangtze River Estuary, Pearl River mouth and Taiwan Strait are the high risk sea areas where major oil spill accidents occur in China (John bywater, 1995). According to the investigation to alien organisms carried by ballast water in Dalian Port, it is found that four kinds of harmful algae such as alga are transmitted to China through the discharge of ballast water from foreign ships, and cause a large area of red tide. The direct economic losses caused by the invasion of alien species are immeasurable.

2.5 Summary of this chapter

Ship pollution is all direct or indirect pollution discharge behaviors that threaten marine ecological environment and human life when the ship carries out marine production and operation. It includes oil pollution, toxic and harmful substances pollution, ship domestic sewage pollution and ballast water pollution, etc. its pollution has the characteristics of persistence, mobility and diversity, As an important aspect of marine pollution, ship pollution has brought great harm to the local economic development, biological resources and ecological balance, tourism environment, etc. (Pergamon, 1980).

CHAPTER 3 THE CURRENT LEGISLATION OF PREVENTION AND CONTROL OF MARINE ENVIRONMENT POLLUTION BY SHIPS IN CHINA

China's total ocean area is nearly 3 million square kilometers, about one third of its total territory. The mainland coastline is more than 18000 kilometers long. Marine activities are very frequent, and China has a wide range of marine interests. The vast ocean has been regarded as a blue land for sustainable development, and it is also a solid material foundation for the all-round development of China's economy, society and environment, Cao and Zhao, 2020). However, the marine environmental pollution is very serious, and the relevant legal measures are not in place or even missing, leaving a huge hidden danger for the development of marine economy. Practice has proved that the most effective way to prevent ship pollution of marine environment and maintain the sustainable development of marine ecology in China is to establish and improve the corresponding legal system (Liu and sun, 2020).

3.1 Laws on prevention and control of ship pollution

Environmental protection law of the People's Republic of China is the basic law of environmental protection, which has a special status and role. In order to protect and improve the marine environment and maintain the marine ecological balance, the policy of putting prevention first and combining prevention with control is strictly implemented, which fully reflects China's determination and confidence in the prevention and control of marine environmental pollution the Marine Environmental Protection Law of the People's Republic of China is the first law in the marine legal system formed after China's reform and opening up, which has made an important contribution to promoting the continuous development of China's marine cause and integrating into the international marine protection team. Like other marine legal systems, the law of the People's Republic of China on marine environmental protection is also an important means to support marine management, which must be constantly updated in order to play a long-term role. Therefore, since its implementation, it has been revised, and in the future, it will be necessary to continue to revise it in order to meet the challenges brought by the development of the situation and the progress of the times, In order to further improve the intensity of marine environmental protection and promote the sustainable use of the ocean. The marine environmental protection law of the People's Republic of China also makes clear provisions on the division of liability for ship pollution. It can be seen that our country's determination of liability for ship pollution damage is not strict liability. At the same time, the newly revised "marine environmental protection law" supplements the provisions of the existing international conventions and

modifies some previous broad provisions, so as to control marine pollution caused by ships more strictly.

3.2 Administrative regulations and rules for prevention and control of marine environment pollution by ships

At present, China has issued a series of laws and regulations on ship pollution, involving many aspects, and has initially established a legal system to prevent ship pollution damage. The Maritime Traffic Safety Law of the People's Republic of China mainly stipulates the specifications of the ship's facilities and the relevant technical conditions that the ship's users must have when navigating, operating and berthing at sea. The regulations of the People's Republic of China on the management of safe operation and pollution prevention of ships issued by the Ministry of transport of the People's Republic of China in 2001 adds to the management level of shipping companies to the legal norms for the prevention and control of ship pollution. MSA also issued the technical rules for statutory survey of domestic seagoing ships in 2004, the fifth of which clearly stipulates the equipment organization and requirements for ship pollution prevention and control.

In terms of the emergency system for the prevention and control of ship pollution, China's first emergency plan against marine pollution accidents, China's marine oil spill emergency plan, is the relevant provisions of China's maritime administrative department in accordance with the newly revised marine environmental protection law, China's first major oil spill accident emergency plan is formulated to meet the needs of the new situation of marine environmental pollution prevention and control.

3.3 Summary of the chapter

The prevention and control of marine environment pollution by ships requires strict implementation of the relevant laws formulated by the National People's Congress and its Standing Committee, as well as strict compliance with the administrative regulations promulgated by the State Council and the departmental rules formulated by various ministries and commissions, so as to achieve substantial results.

CHAPTER 4 PROBLEMS EXISTING THE CURRENT LEGAL SYSTEM

4.1 The laws and regulations on pollution prevention are not robust

At present, the work of ship pollution prevention mainly focuses on the oil pollution of ships, and has established a relatively complete legal system in this respect, involving management, supervision, inspection, compensation and other aspects. But a little ship pollution is not only oil pollution. Although the damage caused by oil pollution is often the biggest and also very serious, it can not be ignored in terms of toxic and harmful substances pollution, domestic sewage pollution and ballast water pollution.

At present, there are no special legal provisions for the transportation of toxic and harmful substances by ships, and the management of toxic and harmful substances is not in place. For example, there are no mandatory regulation on the packaging of toxic and harmful substances, nor there are specific requirements for the identification on the packaging, which means that toxic and harmful substances are not differentiated from the other goods.. If leakage occurs during transportation, it is easy to cause pollution to the sea (Liu and sun, 2020). At present, there is no compulsory requirement for the distribution of dangerous bulk toxic and harmful liquids. It neither stipulates the transportation qualification of holding transport documents nor establishes corresponding legal inspection system.

As for the prevention and control of toxic and harmful substances pollution, there is no relevant laws and regulations on the prevention and control of oil pollution of ships. Although China has joined the International Convention on

civil liability for fuel pollution damage in 2001, and it has entered into force for China in 2009, it only involves international shipping in China. For larger scale domestic shipping, there are still no clear laws and regulations to regulate the liability of the shipowner to combine the shipowner with the shipowner. At present, the liability of oil pollution in ships is divided according to the principle of "fault liability" in civil law, that is, how many mistakes have been made subjectively, the objective liability is to bear, which is contrary to the principle of "who leaks oil and who compensates" internationally. Although China has participated in the International Convention on civil liability for fuel pollution damage in 2001, it is only applicable to the compensation for pollution damage caused by the fuel oil and the materials carried by the ship. Thus, the current laws and regulations on the protection of domestic pollution damage are so limited.

In recent years, the large-scale red tide phenomenon often occurs in coastal areas of China, one of the important reasons is the ballast water discharge carried by foreign ships. These alien red tide organisms have strong adaptability to the environment and are widely distributed. Once the environment is suitable, red tide will burst out, which will cause serious damage to the marine environment. This damage may be devastating. However, the current laws and regulations on ship ballast water pollution are almost blank, and the threat to marine ecological environment cannot be ignored, We should focus on this in the future.

The regulations on pollution prevention specify the standards and contents of the acceptance of pollution prevention and acceptance of docks, ports and

units engaged in ship repair and dismantling. However, some inspection equipment and pollution prevention measures of some early construction acceptance units are not equipped according to the existing standards. Many acceptance units have poor equipment and low standards, Moreover, the weak local economy makes it difficult for some relatively backward acceptance units to complete the standards and contents stipulated in the new regulations in a short time, which is very difficult in practice 《 Article 56 of the pollution prevention regulations stipulates that "the owner or agent of the goods who receive the goods of persistent oil substances transported by sea in the waters under the jurisdiction of the people's Republic of China shall pay the compensation fund for the damage to the oil pollution of the ship. The specific measures for the collection, use and management of the compensation fund for oil pollution damage on ships shall be formulated by the financial department of the State Council in conjunction with the competent department of transportation under the State Council. " But at present, China can also establish the organization responsible for the management and use of the compensation fund for oil pollution damage on ships. The measures for the collection and use of the compensation fund for oil pollution damage on ships have not been promulgated so far, which leads to the failure of implementing the provisions.

4.2 There are defects in the process of pollution prevention of laws and regulations

4.2.1 Unclear division of labor of law enforcement subject

According to the current laws of China, there are several law enforcement subjects for the prevention and control of marine environment pollution by ships. Article 5 of the law of the People's Republic of China on the protection of marine environment makes clear provisions on the division of law enforcement subjects. "The competent administrative department of environmental protection under the State Council is the unified supervision and administration department for the national environmental protection work, Supervise, coordinate and guide the national marine environmental protection, and be responsible for the environmental protection of marine pollution damage caused by construction projects. The State Oceanic Administration Department is especially responsible for the supervision and management of the marine environment, and organizes the investigation, monitoring, monitoring, evaluation and scientific research of the marine environment. The state maritime administrative department is responsible for the supervision and management of the pollution of the marine environment by non military ships in the waters of the port areas and non fishery and non military vessels outside the waters of the port area, and the investigation and treatment of pollution accidents. The ship boarding inspection and treatment of pollution accidents caused by foreign ships sailing, berthing and operating in the sea areas under the jurisdiction of the People's Republic of China shall be conducted. The state fishery administration department is responsible for the

supervision and management of the pollution of the marine environment by non military vessels in the waters of fishing ports and fishing vessels outside the fishing port waters, the protection of the ecological environment of fishery waters, and the investigation of fishery pollution accidents. The environmental protection department of the army is responsible for the supervision and management of the marine pollution caused by military ships and the investigation and treatment of pollution accidents caused. The functions of the departments for the supervision and administration of the marine environment by the local people's governments at or above the county level along the coast shall be determined by the people's governments of the provinces, autonomous regions and municipalities directly under the central government in accordance with this Law and the relevant provisions of the State Council.

Through the analysis of the law of the people's Republic of China on the protection of marine environment, it can be seen that the current system of prevention and control of ship pollution in China is under the unified supervision and treatment of the competent administrative department of environmental protection under the State Council, and the supervision, coordination and guidance of the national marine environmental protection work, and the responsibilities assigned by each department in strict accordance with the laws and regulations, Perform functions in their respective relevant areas. However, due to the cross functions and powers of each law enforcement department, there are always various departments passing the buck in dealing with marine environmental accidents caused by ship pollution, which makes pollution accidents not effectively handled, and

the law enforcement power of each department is too scattered to obtain unified wisdom, which makes our country relatively weak in the enforcement of marine environment pollution. When there is a major pollution event, each department has no independent law enforcement power, and at this time, it can only rely on unified action and coordination of all departments. Especially after China joined the United Nations Convention on the law of the sea, the malpractices of such law enforcement have been revealed without reservation. However, some experts and law enforcement departments in relevant fields in China have recognized this problem. When the law of the marine environment protection was revised in 1999, the issue of unifying the right of law enforcement of the sea was put forward. However, because of the wide coverage, it was unsuccessful, and only joint enforcement of various departments was stipulated. Although some progress has been made in this revision, there are still many areas to be improved. In the future, the unification of maritime law enforcement power should be a trend, which needs to be guaranteed by the corresponding laws and regulations. As a compulsory measure, laws and regulations should have two functions: punishment and education. As a non renewable resource, the marine environment should not only be combined with prevention and governance, but also the law enforcement goal of "prevention first and governance as auxiliary" when adjusting and protecting marine environment. The owner and the user of the ship should establish the correct values of marine environment and strengthen the awareness of marine environmental protection. Because the main body of law enforcement in China to prevent and control marine environment pollution by ships has diversity, there are overlapping enforcement powers in the specific prevention and control practice, which is

not conducive to the control of marine environment pollution by ships, but also easily causes the waste of relevant law enforcement resources, and is not conducive to the full play and implementation of law enforcement resources.

4.2.2 The compensation mechanism for oil pollution damage is not well established

The biggest difficulty in the compensation mechanism of oil pollution damage lies in the determination of the main body of liability for marine environment pollution caused by ships. At present, there is no clear stipulation on the determination of the subject of compensation liability in China. The determination of the subject of liability can only be made in accordance with relevant laws and regulations and departmental rules and regulations, and the way to determine the responsible person and the scope of the responsible person have not been clearly explained. And because of the large area and serious damage of marine environment polluted by ships, the compensation scope of oil pollution damage directly affects the effect of pollution damage management. If the compensation scope is too small, it can not play a deterrent role, if the compensation scope is too large, it will also affect the development of shipping industry.

4.2.3 The emergency system for ship pollution is not perfect

Because the ship is unpredictable in the face of risks in the course of marine navigation, no effective preventive measures can prevent the occurrence of

marine accidents. Since the pollution accidents are inevitable, it is particularly important to reduce the inevitable pollution damage to the lowest level, therefore, it is necessary to establish an emergency system for oil spill accidents in China which is suitable for the pollution situation.

At present, the emergency system and mechanism of oil spill implemented in China are not perfect, and the ability to deal with the emergency of oil spill is low, which is not suitable for the increasingly severe situation of oil spill pollution faced by China. The specific performance is in many aspects: first, the current emergency plan for the emergency response to oil pollution emergencies is not high, and it can not effectively control the pollution loss to the minimum. The emergency system for oil spillage of ships is not perfect. Due to the lack of the level of the emergency plan for oil spill, lack of corresponding legal play and policy support, the local government has not paid enough attention to the emergency plan, and the reasonable emergency response mechanism of oil spill formed by the three parties has not been fully implemented. The emergency treatment regulations for oil spillage on ships are also not perfect. Because the current economic strength of our country is not enough to complete the oil spill disposal accident alone, we must mobilize all walks of life, especially large enterprises, to improve the oil spill treatment reaction mechanism in China (Özden Ö zge, Y ı ld ı r ı m Sinem, Fuller Wayne J, Godley Brendan J, 2021). But at present, there are no corresponding laws, regulations and policies to protect the rights and interests of private clean-up companies. The market mechanism is not enough, which will directly affect the enthusiasm of the company. Therefore, we can consider the principle of "who pollutes, pays, who invests and benefits" to ensure the

smooth, healthy and long-term operation of the oil spill reaction mechanism. The emergency measures for oil spillage of ships should also be improved. Although China is increasing the investment of the emergency response mechanism for oil spill, at present, the emergency response capacity of our country can only meet the small-scale oil spill pollution emergencies, and the gap between the advanced oil spill response mechanism and the international oil spill response mechanism is still relatively large.

4.3 Summary of the chapter

The current laws and regulations of China, such as the law of the people's Republic of China on the protection of the marine environment, the law of the people's Republic of China on environmental protection, and the regulations on the management of marine environment against marine pollution by ships, have made clear provisions on the prevention and control of ship pollution, but there are still no toxic and harmful substances pollution, fuel pollution In the process of law enforcement, the law enforcement team is not professional, the level of law enforcement is not high, and there is no clear and perfect oil pollution emergency response mechanism.

CHAPTER 5 LEGAL REFERENCE FOR PREVENTION AND CONTROL OF MARINE ENVIRONMENT POLLUTION BY SHIPS

5.1 International Conventions on prevention and control of marine environment pollution by ships

5.1.1 Convention on prevention of ship pollution

The international legal system for the prevention and control of ship pollution began from the prevention and control of oil pollution. The Torrey Canyon incident in 1967 made countries realize the necessity of preventing and controlling the pollution of oil in ships, At the International Conference on pollution damage on the sea in 1969, international social organizations adopted the 1969 Convention on international interference in high seas oil pollution accidents and the International Convention on civil liability for oil pollution damage of 1969. In accordance with the resolution of the conference, the international oil pollution damage compensation fund convention was adopted in 1971, In 1973, the protocol on the interference of non oil pollutants on the high seas was adopted, which played a milestone role in the international treaties to prevent and control ship pollution. With the development of global economy and trade, the pollution of marine transportation is expanding. The International Maritime Organization has passed a series of international conventions to prevent and control ship pollution, such as the International Convention on oil pollution prevention, response and cooperation. The system of anti pollution convention has been improved.

The preventive Convention on ship pollution mainly includes the ship structure, technical requirements for discharge behavior in production and operation, International Convention on standard provisions of pollution emissions and International Convention on oil pollution emergency response, in which the occurrence of "Torrey Canyon" event in 1967 is the starting point, The International Maritime Organization has formulated and adopted the 1969 Convention on international intervention in oil pollution accidents on the high seas. It makes clear provisions on how coastal states take corresponding measures to prevent, mitigate and eliminate the damage of marine environmental pollution caused by oil spill accidents, and proposes that coastal states have the right to take corresponding measures to eliminate pollution damage, The scope of prevention of pollution damage is extended from local to the whole sea area and even the high seas (Henrik Ringbom, 2010). This is the first time that the international convention has confirmed that coastal states have jurisdiction over marine environment pollution by ships, and has made profound changes to the exclusive jurisdiction of flag States in the past.

With the rapid development of Global trade, shipping industry as an international transportation mode plays an increasingly important role. However, with the rapid increase of sea transportation, a large number of oil and its products, toxic and harmful substances and chemicals are transported in the sea through ships, and the probability of emission pollution and accidental pollution is greatly increased, which seriously damages the marine environment. In order to effectively prevent and control oil and other substances polluting the sea and reduce the harm of accidental oil discharge,

the international maritime organization adopted the International Convention on the prevention and control of pollution caused by ships in 1973. As the first comprehensive international convention to prevent and control marine pollution by ships, this Convention has entered into force slowly.

5.1.2 Convention on compensation for damage caused by ship pollution

The pollution caused by the accident oil spill is huge. The subsequent liability for compensation is not recognized effectively due to the legal provisions at that time. For example, in the pollution incident "Torrey Canyon", according to the relevant laws of the United States, the victims of oil pollution can only get very limited compensation amount. But according to the 1957 Convention on Limitation of Liability of Shipowners, the compensation for oil pollution damage is not enough. In order to solve this problem, the international maritime organization adopted the International Convention on civil liability for oil pollution damage of 1969 in Brussels to ensure that the victims of pollution damage are fully compensated. The Convention provides for the applicable ships and oils, and also provides for the determination and limitation of liability for pollution damage.

5.1.3 Legal system of some countries to prevent and control ship pollution

The United States is one of the first countries to notice the harm of marine environmental pollution. As early as the 1970s, the law on marine protection,

research and natural reserve and coastal zone management law were formulated and adopted as special laws for the management of marine pollution in the United States. However, unlike other countries, the United States has not adopted a dual track legal system, the act of pollution of marine environment by ships is fully regulated by the legal system of the United States (Gabriella Kutting, Gotthard Gauci, 1996).

The corresponding laws of the United States to prevent and control ship pollution are due to a major oil spill accident. The oil spill accident of the Exxon Valdez tanker in Alaska sea area caused huge economic losses and caused a fatal blow to the ecological environment of the United States. Therefore, the United States promulgated the oil pollution law of 1990, which further clarified the liability of the responsible person for the pollution of ships for oil pollution damage and the limit of the cost of cleaning up the pollution, improved the legal provisions for the prevention and control of oil spill pollution, and had a significant impact on the development of shipping industry and the global marine ecological protection. The legal system of the United States to prevent and control ship pollution must not only conform to the domestic standards for the construction of oil and toxic and harmful substances transport vessels, but also formulate corresponding oil pollution emergency response plan in accordance with the requirements of the competent department of the United States Department for the prevention and control of ship pollution, the environmental protection agency of the United States.

The oil pollution emergency response plan of the United States is mainly

divided into two stages under the regulations of the U.S. Environmental Protection Agency, namely, the prevention and preparation stage and the oil spill accident treatment stage. Although there are sufficient provisions in legal system, and in specific judicial practice, EPA also stipulates that in case of oil spill caused by ship pollution, regardless of the extent of pollution accident and the time of pollution accident, the party involved in the accident must report to the United States government immediately so that the government can deal with the oil spill quickly, Reduce the damage caused by pollution accidents.

Canada, like the United States, attaches great importance to the prevention and control of marine pollution by ships. In terms of legislation, Canada adopted the Canadian shipping law in 2001 clearly stipulates that the Canadian government has jurisdiction over any oil spill in Canadian waters. And the Canadian government has also established the "ship oil pollution fund". But unlike the United States, Canada's compensation mechanism for oil pollution damage is based on the dual track compensation system of joint compensation by domestic funds and international funds. Therefore, the "ship oil pollution fund" of Canada can be used to pay the cleaning and compensation costs of oil pollution damage, It can also be used to pay Canada's share of the international oil pollution damage costs (Liu and sun, 2020). The relevant legislation and judicial practice in Canada show that, by establishing the corresponding compensation mechanism for marine pollution damage, once the major pollution accidents of marine environment caused by ships have occurred in the sea area under jurisdiction, the government can provide legal basis for the compensation of the accident according to the

compensation mechanism of ship pollution damage, and ensure that the victims of ship pollution are fully compensated.

Like the United States, the Canadian government has set up a corresponding maritime law enforcement team, the coastal guard team, to take charge of the environmental protection work in the sea area, to ensure that once there is a serious and serious pollution accident of marine environment polluted by ships, the coastal guard team can respond to oil spill pollution accidents and toxic and harmful chemicals pollution accidents in a short time, Protect the ecological environment of the waters under Canadian jurisdiction (Zhang, Cao and Zhao, 2020). In 1991, a Canadian tanker carrying 1360 tons of diesel and 43 tons of gasoline suddenly hit the reef, some of which leaked. The Canadian coastal guard team responded quickly within 30 minutes, and carried out a large-scale clean-up work on the polluted sea area, greatly preventing and controlling the marine environmental damage caused by ships. The oil spill emergency response base established by the Japanese government also greatly improves the efficiency of the state in dealing with ship pollution accidents.

5.2 International experience in prevention and control of ship pollution to China

The legal research on marine environment pollution by ships abroad is earlier than that of China, and their theoretical system is relatively mature. Through studying and learning from foreign advanced experience, we can help improve our ability in development of the legal system on pollution prevention and control issues.

5.2.1 Professional law enforcement team

Both the United States and Canada have a professional marine law enforcement team to take charge of the prevention and control of ship pollution. Unlike our national marine police, maritime and marine supervision teams, the US Coast Guard belongs to the United States Department of defense only and has the sole law enforcement power for domestic ship pollution, so as to integrate law enforcement resources, A unified law enforcement body has been formed to prevent and control ship pollution. In case of ship pollution accident, the law enforcement team can quickly and effectively prevent pollution damage, avoid the buck passing due to improper coordination. The United States and Canada have equipped the law enforcement team with advanced law enforcement equipment to locate the detected ships through satellite positioning system, thus effectively reducing the damage caused by ship pollution.,while at present, there are too many law enforcement teams in China, including marine police, maritime supervision maritime departments and etc. This also makes valuable law enforcement resources scattered, and they only patrol and test the sea area under their

“control” by relatively backward equipment, which is seriously affected by external restrictions and their own cruise ability.

5.2.2 Sound compensation mechanism for oil pollution damage

Both the United States and Canada have a established good compensation mechanisms for oil pollution damage. Because ship pollution accidents will cause serious pollution damage, it is impossible to complete the huge compensation by a single individual. Therefore, the state must set up a special oil pollution compensation fund (Chenhao Jin, Yufeng Xu, 2021). Through relevant legislation, the United States establish a single compensation system of domestic pollution damage fund, manage and use the fund through the establishment of "oil pollution fund center", and guarantee the source of the fund through the assessment of cargo owners and oil companies in ship transportation. If there is a ship pollution accident and the compensation capacity of the relevant responsible person is insufficient, the oil pollution fund can compensate for it, which very well guarantees the rights and interests of the victims of pollution damage. Canada has joined the Establishment of International Oil Pollution Compensation Fund in 1971 and its protocol to guarantee the international compensation for ship pollution damage. In addition, Canada has established a domestic compensation fund for oil pollution damage through legislation, and formed a dual track compensation system for international and foreign fund compensation for oil pollution damage, the rights of the victims of pollution damage are guaranteed. However, for China, it has not joined the International

Convention and its protocol for establishing the International Oil Pollution Damage Compensation Fund in 1971. For the establishment of a compensation fund system in China, it is not clear whether we should draw on the dual track system of Canada or the domestic fund system of the United States. If we follow the single track system of the United States, the pollution caused by accidents of ships is generally serious, and the amount of compensation is very large, otherwise it will not play a role in compensation. Therefore, we should supplement the compensation system by following the dual track fund compensation system of Canada.

5.2.3 Effective oil pollution emergency response mechanism

The United States is divided into ten emergency response zones. Each region makes corresponding oil spill response plans according to its own actual situation, and divides them into different grades. If the pollution accident is of a low grade, local accident management personnel and parties can quickly eliminate hazards, which can save law enforcement resources and improve the efficiency of ship pollution prevention and control, although the emergency system of oil spill of class 4 ships has been initially formed in China, it is not good enough, and the ability to deal with the sudden oil spill is low, which is not fully adapted to severe oil spill pollution situation in China.

5.2.4 Efficient integrated management mode

At present, there are too many law enforcement departments in China to

prevent and control ship pollution, and there is no effective coordination among them. For example, the maritime administration belongs to the Ministry of Transportation, the marine police belong to the Armed Police Corps, and the Marine Bureau belongs to the Ministry of Natural Resources. Such a joint enforcement composition inevitably lacks unified leadership, and eventually will cause the information communication of law enforcement resources to be blocked, it makes law enforcement resources wasted. The United States has many departments that perform the functions of preventing and controlling marine environment pollution by ships, which belong to a larger agency. In the administrative enforcement of marine environment pollution prevention and control, each department can effectively exercise its relevant power of law enforcement. For the places where the administrative power intersects, it is divided by the same competent authority, It is more conducive to the government departments to prevent and control ship pollution, and also improve the efficiency of the national work to prevent and control ship pollution, and save administrative costs. The European Union also takes charge of the inspection and supervision of maritime safety in various countries through the establishment of the European maritime safety agency. Therefore, it is impossible to fully handle the prevention and control of ship pollution by a certain functional department alone. Through the coordination and control of multiple departments, the integrated management mode is the only feasible mode to prevent marine environment pollution by ships.

5.3 Summary of this chapter

At present, the prevention and control of marine environment by ships has become a hot issue of global concern. At present, China has joined many international treaties on the prevention and control of ship pollution. In the specific aspects of prevention and control of ship pollution, we need to learn from developed countries and regions such as the European Union, Canada, the United States, and establish a sound legal system. The law enforcement team and the pollution damage compensation mechanism should learn from the experience, improve the oil pollution emergency response mechanism and oil pollution damage compensation mechanism in China, and establish professional law enforcement teams and an efficient comprehensive management mode.

CHAPTER 6 COUNTERMEASURES TO IMPROVE THE LEGAL SYSTEM OF MARINE ENVIRONMENT POLLUTION PREVENTION AND CONTROL

6.1 Develop the relevant laws and regulations for ship pollution prevention

At present, the legislation of prevention and control of ship pollution in China is mainly on oil pollution legislation, and special laws and regulations on prevention and control of toxic and harmful substances and special laws and regulations on prevention and control of marine environment caused by fuel oil pollution should also be formulated. In terms of prevention and control of toxic and harmful substances pollution, China should classify the bulk toxic and hazardous liquid substances according to the degree of harm caused by the pollution according to the relevant provisions of the International Convention on the prevention and control of pollution caused by ships, as amended by the 1978 protocol, and make clear the discharge standards, and classify and store the toxic and harmful substances in transportation, The storage standard shall meet the requirements, and the outer packaging shall be clearly required. The outer packaging identification shall be specific and standardized. For the poisonous and harmful liquid substances transported in bulk, the inspection and acceptance system shall be established. If the inspection is qualified, the certificate of conformity shall be issued. When transporting the toxic and harmful substances, the declaration shall be made in advance. And combined with the actual situation of marine pollution by ships in China, the relevant laws and regulations are actively formulated for a series of problems such as fuel pollution damage, ship primer pollution damage, domestic sewage discharge, etc. in practice, it is necessary to make

laws and regulations.

For the prevention and control of ballast water pollution, due to the lack of relevant laws and regulations, we should strengthen legislation in the future, develop relevant laws as soon as possible, and implement the supervision and treatment of ballast water as soon as possible. Through the formulation of laws and regulations, foreign ships should be more monitored, and then the emergency system for ballast water carrying water organisms and pathogens should be formulated as soon as possible. If the invasion and pollution damage of alien species occur, efforts should be made to minimize the damage. And we should record the ecological environment monitoring system of coastal system, through which we can know the specific impact of the alien species carried by the ballast water on the marine environment in China, so as to make corresponding countermeasures. Finally, we should join the International Convention on Ballast water as soon as possible and do a good job in the prevention and control of ballast water pollution.

6.2 Improve the law enforcement system

6.2.1 Make clear the subject of compensation liability

To improve the compensation system for pollution damage, we must make clear the main body of the liability for the damage, and the determination of the liability subject for the damage caused by the pollution is generally complex. Because the pollution damage is generally serious, if only the person who causes the pollution damage is asked to make the compensation, then the economic strength of the civil liable person is not enough to compensate for the pollution damage, the rest of the part can only rely on the state to pay, so it is not effective to pay compensation by the division of tort liability in the civil law, so the secondary division of the subject of damages liability must be carried out.

The main body of the liability for damage caused by marine pollution by ships can draw lessons from the international regulations, such as the 1969 International Convention on Civil Liability for Oil Pollution Damage and its Protocol, the International Convention on Civil Liability for Fuel Pollution Damage in 2001 and the oil pollution law of the United States on the liability person for the damage caused by the pollution of ships, which will bring the owner and the operator of the ship, the charterer and the direct responsible person of pollution damage are the main body of compensation for marine environment pollution in China. Even if there may be any ship pollution damage accidents later, they also have enough economic ability to deal with marine pollution and accelerate the process of marine ecological protection.

In the division of responsibilities of each responsible person, it is suggested to adopt the common joint and several liability mode in the current civil system, so that each responsible person shall be liable for the damage caused by the marine environment pollution caused by the ship, and shall be recovered in proportion in the interior, so as to better guarantee the smooth progress of the marine pollution control.

6.2.2 Clarify the main body of the claim for pollution of ships

The main body of claim for ship pollution should be clarified. The most direct impact of pollution by ships on the marine environment is to destroy the marine ecological environment. According to the constitution of China, "mineral deposits, water flows, forests, mountains, grasslands, wasteland, beaches and other natural resources belong to the state, that is, they are owned by the whole people". It decides that the natural resources of the state within the jurisdiction of the country, therefore, the sea area to which it belongs has indisputable ownership and the state is the only legal owner. Moreover, according to the principle of compensation for environmental pollution damage, the party entitled to claim damages must be the person who has the right to claim damages who are infringed or lost by law and thus suffered economic losses. The proposer of damages is not limited to natural person, then when the marine environment in China suffers pollution damage, The state, as owner of marine resources, has the right to make a claim.

Although the state is the subject of claim on legal basis, there is still

controversy in the specific operation, that is, the representation of the state. Just as a legal person in an organization form can not exercise its own civil rights and obligations, the state can not exercise its own rights and obligations. However, as the agency of daily management of state affairs, the administrative agency has strong administrative force. For the person responsible for the damage caused by ship pollution, it is the relationship between management and being managed. The relationship between punishment and punishment is the relationship between the administrative organ and the punished person. Although the civil litigation emphasizes the equality of civil subjects, the results of administrative punishment are mostly used as evidence in civil compensation litigation, This leads to the majority of the main body of liability for pollution damage to the administrative organs on behalf of the state to exercise the right to state compensation plaintiff qualifications.

The law of the People's Republic of China on the protection of marine environment stipulates that the law enforcement subjects of marine environment pollution caused by ships include the administrative department for environmental protection under the State Council, the State Department of Marine Administration, the state maritime administrative department, the competent department of national fisheries administration, the Department of environmental protection of the armed forces and the local governments at or above the county level along the coast, but except for the local governments at all levels along the coast, other law enforcement subjects have clear specific enforcement authority and scope according to relevant laws and regulations. For the local governments at the county level along the coast,

they have certain supervision and management rights of the marine environment. It can be said that local governments at or above the county level have the function of protecting marine ecological environment through the authorization of law, and the central government has the function of exercising the ownership of marine environment in China. In the litigation activities where the central government cannot participate in the litigation of compensation for marine pollution damage in all respects, the local people's governments at or above the county level shall, according to the authorization of the central government, it can exercise the ownership of the marine environment in China within the scope of authorization.

6.2.3 Clarify the scope of compensation for pollution damage of ships

At present, there are no clear provisions in laws and regulations for the scope of damages caused by marine pollution caused by marine environment pollution. The knowledge has initially defined the main body of liability and claim after the damage. In case of damage to the marine ecological environment, marine protected areas and marine aquatic resources and causing significant losses to the state, the marine environment supervision and administration departments shall, in accordance with the relevant provisions of the law of the People's Republic of China on the protection of the marine environment, raise a claim for damages to the responsible person. The specific compensation scope is confirmed by the traditional civil tort liability in China.

Because the damage caused by the pollution of the sea by ships is very huge and usually lasts for a long time, cleaning up pollution as soon as possible becomes an important measure. At present, there are no laws and regulations on compensation for marine pollution damage. The provisions on civil compensation for marine environment pollution are scattered among many regulations and norms. However, although the current laws and regulations can clearly divide civil liability and compensation scope, the damage caused by marine environment pollution caused by ships is very large in practice, The difficulty of marine ecological environment protection is increased in the intangible way. Therefore, we should combine the economic level, take relevant domestic laws and regulations as the basis, and refer to the international convention to construct a compensation mechanism for ship pollution damage in line with the national conditions of our country.

6.3 Reform the law enforcement system for the prevention and control of marine environmental pollution by ships

Legislation is the premise of law enforcement, and law enforcement is the continuation and reality of legislation. If there is no efficient law enforcement, the best legislation will become empty talk. Law enforcement can implement the provisions of laws and regulations, strengthen citizens' awareness of abiding by the law, regulate citizens' illegal behaviors, and finally realize the realization of legal provisions. As a big maritime country, China has suffered from serious ship pollution, the protection of the marine environment has become a serious task that must not be ignored, and it is urgent to strengthen the marine law enforcement force. The marine law enforcement power of a country is not only the performance of the comprehensive law enforcement ability within the jurisdiction, but also reflects the maintenance and comprehensive utilization of marine rights and interests of a country, and reflects the comprehensive law enforcement level of a country (Xu and Li, 2020).

6.3.1 Establish a professional and comprehensive marine environmental

law enforcement team

Whether a country's marine pollution law enforcement force is strong or not is a concrete embodiment of the country's comprehensive national strength. Only with a strong marine pollution law enforcement force can we better protect the healthy and sustainable development of China's marine ecological environment and better serve China's current economic construction. It is

necessary for China to learn from the management mode of developed countries, integrate law enforcement resources, and establish a comprehensive law enforcement force for marine pollution.

6.3.2 Improve the level and ability of law enforcement

At present, the marine law enforcement team is rough in the process of law enforcement, so it is urgent to gradually improve the law enforcement level of China's prevention and control of marine environmental pollution, increase the awareness education of marine environmental protection for ship management companies and ship operators, and provide relevant personnel with the guidance of the United Nations Convention on the law of the sea, marine environmental protection law, and marine environmental protection law In order to make relevant personnel fully aware of the great significance of protecting the marine environment, the law enforcement agencies should increase the punishment and strengthen the supervision and inspection of the polluted sea areas, efforts should be made to minimize the damage caused by ship pollution to the marine environment (Gao, 2020).

6.3.3 Establish a long-term mechanism of ship pollution prevention

supervision and management

China's law enforcement agencies for the prevention and control of marine environmental pollution by ships should establish a long-term anti pollution

supervision and management mechanism, focus on which small ships and old ships should be inspected in the inspection, improve the ability of such ships to prevent and control ship pollution, and regularly inspect toxic and harmful substances, and seriously deal with those that do not meet the requirements once they are found out, long term follow-up assessment should be carried out for the ship management personnel to strengthen the training of the personnel. The mastery of the international conventions on the prevention and control of ship pollution and the relevant laws of China are investigated, and the operation skills of the crew for ship navigation are also investigated, so as to minimize the human pollution factors (Huang and Zhang, 2020). Maritime and fishery administration departments should also regularly check the operation of new instruments and implement safety inspection. Anti pollution law enforcement units should regularly conduct spot checks on first-line factories to prevent equipment with potential safety hazards from entering the market. Ships with unqualified anti pollution standards will not be issued certificates, so as to reduce the occurrence of marine environmental accidents caused by ships at the source.

6.4 Establishment of a ship pollution emergency system

Although China continues to improve the legal system to prevent the occurrence of ship pollution accidents, the risk of such accidents will not disappear completely, and once the ship pollution accidents occur, it will cause serious damage to the marine environment. Therefore, it is necessary to consider how to minimize the damage caused by ship pollution and minimize the impact on the local marine ecological environment and human health. In this regard, the international practice is to establish and improve the national ship pollution emergency system, effectively improve the ability to deal with sudden pollution incidents at sea, reduce pollution damage caused by a series of major disasters such as oil pollution, toxic and harmful substances pollution, and effectively prevent the disastrous consequences of ship pollution of the marine environment.

At present, China has only initially established the emergency system of marine oil spill pollution, but there are still some deficiencies in setting up an emergency system of marine environmental pollution caused by ships. As the pollution of marine environment by ships involves various interests, it is necessary to take the government as the leading role, put forward a unified implementation plan and emergency plan in combination with the actual needs of local government work, establish an emergency command center for marine emergencies, and gradually form an internationally advanced standardized and unified command and dispatch system for marine pollution emergency, the technical standards of the emergency system should be clearly standardized, and the risk assessment of the emergency system should be strictly implemented to prevent further damage to the marine ecological

environment.

Although China is gradually strengthening and improving the ship pollution emergency response system, it is necessary to set up a separate organization to coordinate and handle the ship pollution emergency response plan because of the diversity and intersection of the law enforcement bodies involved in ship pollution. An emergency response office should be formed, and the staff should work from the environmental protection department, maritime and fishery administration departments should coordinate the contact among various departments, clarify the responsibilities and specific division of labor, and ensure the smooth implementation of ship pollution emergency response plan.

6.4.1 Improve the monitoring system and coordination control mechanism

Although the monitoring and control system has been initially formed, and the MSA of the Ministry of Communications has also set up detection institutions in various coastal areas, the ship anti pollution detection and control system covering all the sea areas of the country has been initially formed. In coastal areas, a number of ship automatic identification system base stations and ship traffic management system have been set up, which greatly improves the means and efficiency of marine environmental monitoring for ship pollution in China. In addition, China has also built two national oil spill emergency technology exchange demonstration centers, which are based on advanced technical facilities and guided by advanced

management concepts, greatly improving the control and cleaning capacity of oil spill pollution from ships in the northern sea area, and providing advanced experience for the implementation of oil spill pollution prevention and control in China. However, only two demonstration centers are far from enough. In the future, it is necessary to increase the number and scale of ship pollution emergency treatment centers, and finally build a ship pollution emergency command center covering all sea areas.

The marine environmental damage caused by ships has a very large risk of diffusion. Therefore, the implementation of emergency response to ship pollution has certain timeliness, and we must seize the time. The specific implementation can learn from the experience of the United States and Japan. The U.S. Coast Guard has set up 10 emergency response centers in the main sea areas. Japan has set up 11 oil spill emergency response bases, which further improves the efficiency of the government in handling ship pollution accidents. We should also, in accordance with the provisions of international conventions and domestic laws, take immediate measures to control the expansion of pollution and deal with it promptly. We should report to the competent authorities as soon as possible, and report to the nearest competent authorities immediately after the polluted ships enter the port for further investigation and treatment.

6.4.2 Strengthen international cooperation in ship pollution prevention

The prevention and control of marine environment pollution by ships is a very

large project. It is not enough to rely on the strength of one country alone. It is necessary to strengthen international cooperation in this field the United Nations Convention on the Law of the Sea clearly regards "international cooperation in marine environmental protection" as a basic principle for the protection of the marine environment. Specifically, it depends on all countries to explore ways and means to prevent and control marine environmental pollution through consultation and cooperation, and take unified measures and actions to protect the marine environment on the premise of not harming the sovereignty of all countries. In the process of implementation, standards and procedures for preventing and controlling marine environmental pollution by ships should be jointly formulated within the constraints of multilateral treaties. In international cooperation, it is better for relevant international organizations to coordinate and guide. In this way, the cooperation between countries also reflects the implementation of inspection plans for preventing and controlling marine environmental pollution by ships, Improving the management system of preventing and controlling marine environment pollution by ships (Soto Navarro J, jord) á G,Compa M,Alomar C,Fossi M C,Deudero S, 2021) 。

6.5 Summary of this chapter

For China, the prevention and control of marine environment pollution by ships is a systematic project, which needs to improve the supporting laws, and must adapt to the current law enforcement system of the country, establish a professional law enforcement team, and improve the emergency management system of ship pollution. In terms of compensation for pollution damage from ships, it is necessary to clarify the subject of claim and liability for pollution damage from ships, determine the scope of compensation for pollution damage, improve the compensation mechanism for pollution damage from ships, and establish a compensation fund for oil pollution damage from ships suitable for China's national conditions.

CHAPTER 7 CONCLUSION

There are abundant resources in the ocean, which are also the “cornerstone” for human survival and development. In the past century, due to the vigorous development of global trade, sea transportation has become the most important mode of transportation, and it is also the most inexpensive mode of transportation, which has been chosen by more and more people. However, with the increasing frequency of marine transportation, the resulting oil pollution, toxic & harmful substances pollution, sewage pollution, and ballast water pollution are also becoming more and more serious, which greatly damages the marine ecological balance and causes marine ecological pollution. Ship pollution as a major cause of marine ecological pollution must not be ignored.

At present, the legal system on ship pollution prevention is not good enough. At present, most of the existing laws and regulations are not really operable, the provisions are quite detailed, but there are difficulties in their implementation. So far, there is not yet a very good system of compensation for ship pollution damage. When there are problems related to compensation for ship pollution damage, we can only learn from maritime laws and other laws and regulations, which will easily lead to a waste of judicial resources, and there is no uniform applicable legal norms. In order to cope with this situation, it is urgent that we improve the current legal system to prevent ship pollution to the marine environment, so as to solve the existing problems. In the process of improving the relevant legal system, we must stick to the principle of sustainable development, and follow the concept of "green water and green mountains are golden mountains and silver mountains", so as to

leave room for the development of future generations. Drawing lessons from the advanced international experience and systems, combined with China's national conditions and the current marine market, through the legislation of the National People's Congress to improve the legal system of preventing and controlling ship pollution of the marine environment, from the system to ensure that the marine ecological balance is ultimately guaranteed.

Prevention and control of ship pollution is a very heavy task, and it must be carried out in accordance with the systematic mode, the system should improve laws and regulations on the oil pollution, toxic & harmful substances pollution, domestic sewage pollution, ballast water pollution and other corresponding laws and regulations, adapt to China's current law enforcement system. Coming to experience, we should learn from developed countries and regions such as the United States, Canada and the European Union, establish professional law enforcement teams, adopt an efficient comprehensive management mode, set up a unified ship emergency response agency, carry out unified coordination activities and make uniform arrangement, invite experienced personnel from other departments, and improve the coordination mechanism and monitoring mechanism, establish and improve the independent emergency system of ship pollution in China. In order to better fulfill the liability of ship pollution damage compensation, it is necessary to clarify the liability subject and make clear the subject of ship pollution damage, determine the specific scope of damage compensation, improve the ship pollution damage compensation mechanism, and set up a ship oil pollution damage compensation fund in line with the national conditions in China.

REFERENCES

Buono Andrea, Li Yu, Paes Rafael Lemos. Editorial for the Special Issue “Remote Sensing of the Oceans: Blue Economy and Marine Pollution” [J]. *Remote Sensing*, 2021, 13(8).

Yu Zhirong. Some opinions on the revision of marine environmental protection law [J]. *Journal of Zhejiang Ocean University (humanities edition)*, 2020, 37 (06): 1-7

Cruise ship pollution. [J]. *Scitech Book News*, 2009, 33(3).

Crook, John R. International Maritime Organization Approves U.S.-Canadian Proposal for Strengthened Controls on Air Pollution from Ships in North American Waters [J]. *The American Journal of International Law*, 2010, 104(2).

Henrik Ringbom. Preventing Pollution from Ships – Reflections on the ‘Adequacy’ of Existing Rules [J]. *Review of European Community & International Environmental Law*, 1999, 8(1).

Ji Shan. Thinking on the transformation of China's marine pollution emergency management mode [J]. *Journal of Management Cadre College, Ministry of transport*, 2015, 25 (01): 36-38

Li weipeng. Research on legal issues of marine environmental pollution prevention and control by ships in China [D]. *Northeast Forestry University*, 2012

Regulations of the people's Republic of China on the management of emergency preparedness and disposal of marine environmental pollution caused by ships [J]. *Selected papers of judicial business*, 2011 (21): 12-22

Gabriella Kutting, Gotthard Gauci. International environmental policy on air pollution from ships [J]. *Environmental Politics*, 1996, 5(2).

John Bywater. Government response to marine pollution from ships [J]. *Marine Policy*, 1995, 19(6).

Huang He. Interpretation of the regulations of the people's Republic of China on the prevention and control of marine environmental pollution by ships and their related operations [J]. *China Maritime*, 2011 (02): 39-40

IMCO symposium on prevention of marine pollution from ships [J]. *Pergamon*, 1976, 7(7).

Liu Kun. Regulations on the prevention and control of marine environmental

pollution from ships and Discussion on maritime supervision [a]. Marine Pollution Prevention Committee of Chinese maritime society. Proceedings of 2010 Annual Conference on marine pollution prevention [C]. Marine Pollution Prevention Committee of Chinese maritime Society: Chinese maritime society, 2010:4

He Shijun. On the responsibilities of all parties in ship anti pollution emergency under the new anti pollution regulations [a]. Marine anti pollution Professional Committee of Chinese maritime society. Proceedings of 2010 Annual Conference on ship anti pollution [C]. Marine anti pollution Professional Committee of Chinese maritime Society: Chinese maritime society, 2010:6

J. W. Woloniecki. Oil Pollution from Ships. International, United Kingdom and United States Law and Practice[J]. International and Comparative Law Quarterly,1986,35(4).

Wang Hui. Interpretation of regulations on the prevention and control of marine environmental pollution from ships [J]. Environmental economics, 2010 (07): 55-58

Jiang Shan-Shan,Li Jing-Mei. Do political promotion incentive and fiscal incentive of local governments matter for the marine environmental pollution? Evidence from China's coastal areas[J]. Marine Policy,2021,128.

Chen Wei. Requirements for maritime supervision in regulations on the prevention and control of marine environmental pollution from ships [J]. China shipping, 2010 (07): 56-57

Mugilarasan M.,Karthik R.,Purvaja R.,Robin R.S.,Subbareddy B.,Hariharan G.,Rohan S.,Jinoj T.P.S.,Anandavelu I.,Pugalenthi P.,Ramesh R.. Spatiotemporal variations in anthropogenic marine litter pollution along the northeast beaches of India[J]. Environmental Pollution,2021,280.

Meng Chunyang, Xu Yuwei. On the optimization and integration of environmental resources law [J]. Journal of Chifeng University (Chinese philosophy and Social Science Edition), 2020,41 (10): 16-21

Booth Ian J.. International ship pollution law: Recent developments at UNCLOS[J]. Pergamon,1980,4(3).

Wang Hao. Construction and improvement of China's environmental and resource legal system in the new era [J]. Journal of Xihua University (PHILOSOPHY AND SOCIAL SCIENCES EDITION), 2020,39 (03): 107-114

Tai Yutong. Environmental resources protection law and sustainable development [J]. Regional governance, 2020 (01): 67-69

Chen Peng. Comments on Maritime Traffic Safety Law (Revised Draft) [J]. World maritime transport, 2021,44 (02): 1-4

Gao Ning. Analysis of maritime administrative law from the perspective of maritime traffic safety [J]. World maritime, 2020,43 (02): 47-51

Chen Jiahui. Research on the path of China's marine environment governance under the theory of "marine community of destiny" [J]. Modern commerce and trade industry, 2021,42 (12): 51-52

Garcia Carlos Alberto Eiras, Evangelista Heitor, Möller Osmar Olinto. Comments on "Dredging in an estuary causes contamination by fluid mud on a tourist ocean beach. Evidence via REE ratios" by N. Mirlean, L. Calliari, and K. Johannesson in Marine Pollution Bulletin 159 (2020) 111495. <https://doi.org/10.1016/j.marpolbul.2020.111495>[J]. Marine Pollution Bulletin, 2021, 166.

Ying Qingzhi, Chen Yiwen. Marine ecological civilization and its construction -- Taking National Marine Ecological Civilization Construction Demonstration Zone as an example [J]. Journal of Nanjing University of Technology (SOCIAL SCIENCE EDITION), 2021,20 (01): 11-22 + 111

Liu Yong, sun Wenliang. Thoughts on the construction of marine ecological civilization and its guarantee system in China [J]. Journal of Hubei Administration University, 2020 (06): 25-30

Zhang can, Cao Ke, Zhao Jianhua. Opportunities and challenges for marine ecological environment protection [J]. Environmental protection, 2020,48 (07): 9-13

The environment and financial consequences of oil pollution from ships[J]. Pergamon, 1974, 12(1).

Xu Guoping, Li Yan. An outline of the legal system of ship pollution prevention and control in the United States [J]. Law review of Haida, 2020 (00): 424-441

Gao Ning. Problems in ship pollution control in China and suggestions for improvement [J]. Journal of Zhejiang Ocean University (humanities edition), 2020,37 (06): 19-23

Huang Jing, Zhang Xiaodong. Integration of maritime authorities' prevention and control of ship pollution and marine environmental public interest litigation [J]. Journal of Zhejiang Ocean University (humanities edition), 2019,36 (06): 12-15

SotoNavarro J,Jordá G,Compa M,Alomar C,Fossi M C,Deudero S. Impact of the marine litter pollution on the Mediterranean biodiversity: A risk assessment study with focus on the marine protected areas.[J]. Marine pollution bulletin,2021,165.

Chenhao Jin,Yupeng Xu. Risk Analysis and Emergency Response to Marine Oil Spill Environmental Pollution[J]. IOP Conference Series: Earth and Environmental Science,2021,687(1).

Özden Özge,Yıldırım Sinem,Fuller Wayne J,Godley Brendan J. Anthropogenic marine litter on the north coast of Cyprus: Insights into marine pollution in the eastern Mediterranean.[J]. Marine pollution bulletin,2021,165.

Sheppard Charles,Elliott Michael,Galgani Francois,Hutchings Pat,Morton Brian,Richardson Bruce,Yang Gui Peng. From what and to where? Celebrating the first 50 years of Marine Pollution Bulletin[J]. Marine Pollution Bulletin,2021(prepublish).