

Discussion on Marine Pollution Caused by Ships

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Abstract: Water is the source of life and the material basis for human beings. With the development of human society, the environmental pollution problem exposed, under the traditional economic growth model, has become increasingly prominent and caused serious consequences. Under the guidance of sustainable development strategy, natural ecological environment protection has become the consensus of all mankind and promotes the development and reform of various industries. Therefore, it is imperative to effectively prevent and control ship pollution. Based on the overview and analysis of ship pollution, this article focuses on its effective prevention and control.

Keywords: Ship Pollution; Harm; Effective Control

China has vast territory and abundant water resources, but with the deterioration of ecological environment, its quality has dropped significantly compared with the past, seriously affecting the sustainable development of society. Ships, as an important means of transportation, are frequently polluted due to the influence of multiple factors in production and operation practice, which is the focus of wide attention from all walks of life. Up to now, effective prevention and control of ship pollution is imperative, which has aroused heated discussion in academic circles.

1. Overview of ship pollution

Ship pollution mainly refers to the irreversible pollution behavior of marine environment caused by leakage of fuel oil and cargo carried by subjective and objective factors during construction, operation, dismantling and scrapping. Generally speaking, ship pollution has diversified characteristics, and all of them have caused great harm, which is contrary to the concept of sustainable development of human society. Its effective preven-

tion and control is very important, and it is an indispensable part of maintaining green ecology. Among them, oil pollution from ships can be divided into two categories: oil spill pollution and oil sewage. Once it occurs, an oil film will form on the sea surface due to the chemical and physical characteristics of oil itself, which will block the oxygen exchange between seawater and air, and at the same time weaken sunlight, causing a series of biological chain reactions. At the same time, ship life pollution includes domestic sewage and domestic garbage. Marine domestic sewage is rich in oxygen-consuming organic matter, and carries a variety of microorganisms, parasites, etc. When anaerobic reaction occurs, CH₄, NH₃ and organic acids are produced, which leads to the decline of water quality and seriously damages the living environment of marine life. It is worth pointing out that due to the mobility of water itself, ship pollution will not be fixed in a certain area, sometimes it may spread to many areas, and in severe cases it may also lead to an increase in harmful substances in the air, which has an irreversible impact on the natural ecology.

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2. The effective prevention and control measures of ship pollution

It is precisely because of the diversification and serious harm of ship pollution that its effective prevention and control, as an important part of human sustainable development project, should be widely supported by all sectors of society. According to the actual situation, the author puts forward the following practical measures for reference.

2.1 Improve legislation

From the perspective of the strategy of comprehensively governing the country according to law, it is of great practical significance to further improve the construction of legislation on ship pollution, and to a certain extent, it promotes citizens' awareness and drives the continuous advancement of this prevention and control project. Ship pollution is a major issue related to the sustainable development of human society, which has been widely concerned by the international community. The related prevention and control work should not only implement domestic laws and regulations, but also timely and effectively fulfill the effective international conventions to which China has acceded. Therefore, it is suggested to speed up the docking between China's legislation and international conventions, form a corresponding transformation mechanism, further clean up normative documents, and establish long-term applicable administrative regulations or rules and regulations, which will help to enhance China's international image. At the same time, according to the characteristics of ship pollution, the current laws and regulations are re-examined and evaluated, and the requirements of the national "discharge suit" are actively responded, and further refinement is made by means of local legislation to ensure its timeliness and feasibility. On this basis, the mode of ship pollution prevention and control should be reformed, the management responsibilities of relevant functional departments should be clarified, the macro-overall planning at the government level should be increased, and the technical guidance to front-line law enforcement departments should be paid attention to, so as to effectively expand the effect of ship pollution prevention and control. In addition, adhering to the principle of simplifying political power, facilitating the people and benefiting the people, giving full play to the advantages of trade asso-

ciations, helping to establish a perfect self-discipline mechanism and strengthening enterprise autonomy are bound to achieve twice the result with half the effort. In addition to the above, combined with the Regulations on Emergency Preparedness and Emergency Treatment of Marine Environment Polluted by Ships, an emergency treatment mechanism for ship pollution is formulated to avoid causing further consequences.

2.2 Strengthening supervision

Relying on the improvement of the above legislation, further strengthening the dynamic supervision of ship pollution is an important means to achieve effective prevention and control. In the information age, the development of advanced science and technology such as computer, internet and big data has created convenient conditions for it, giving full play to the role of "maritime communication" as a mobile terminal and improving the prevention and control level of ship pollution. In the specific practice process, the ship pollution prevention and control materials of each unit are incorporated into the big data platform system, and according to the requirements of "implementing the main responsibility of enterprises", the whole process of ship production and operation is dynamically supervised, and the inspection of maritime departments is strengthened, and violations are found in time and dealt with seriously, while resources are allocated in time to prevent pollution from expanding. At the same time, we should strengthen the supervision of cargo carried by ships, establish sensitive awareness of solid waste, construction waste, engineering muck, etc., and formulate corresponding standardized operation procedures. With the help of aviation aircraft, we can dynamically supervise the whole process, guide the classification and treatment of ship waste, and generate a big data system, so as to facilitate the development and reuse of waste resources and thoroughly implement the idea of "green development". According to the above analysis, serious ship pollution may also damage the air quality. According to the sulfur content control targets in each stage, the work of energy conservation and emission reduction should be strictly implemented. Through the effective linkage among local governments, power supply departments and other departments, a sound information notification system should be established, and on-site administrative inspections

should be carried out in depth, and enterprises with problems should be issued with fines, which should be blacklisted for real-time tracking management.

2.3 Rich support

The key point of ship pollution lies in prevention, while the key point lies in treatment, which involves the simultaneous input of multiple resources such as capital, technology and equipment. The effective prevention and control work needs to continuously enrich and support the system construction and improve the infrastructure environment. Specifically, under the guidance of a series of policy documents of the CPC Central Committee, special budgetary funds from local governments were set up to include the projects such as receiving, transshipment and disposal of ship pollutants, which were uniformly allocated and allocated by the Maritime Safety Administration. The principle of annual investment and rolling use of surplus was implemented, a scientific financial plan was established, and audit work was strengthened to ensure that all funds were put in place. On this basis, we should further enrich the functional matching of environmental protection system, make full use of modern scientific and technological support, timely grasp the dynamic changes of information such as hydrology, meteorology, freight logistics, water accidents, etc., and set up an electronic screen in the water service area to broadcast in real time, so as to reduce the occurrence of ship traffic accidents and further reduce the pollution risk. At the same time, it can also rely on the Internet public service platform to accelerate the sharing of relevant dynamic information and improve the efficiency and quality of ship pollution prevention and control work. In addition, a ship pollutant recovery station is set up, especially a sewage collection system is set up at the hazardous chemicals wharf, and the initial rainwater and production sewage are treated centrally by qualified enterprises. The principle of classified storage is adopted, and the corresponding advanced technology and equipment are configured to minimize the impact of ship pollution on the natural ecology.

2.4 Multi-party linkage

According to the new public service theory, it advocates democratic value and public interest, emphasizes the construction of government governance mode of

“participatory country”, and puts democratic governance and citizen participation at the core position. There is no doubt that ship pollution has an impact on natural ecology, which threatens the survival and development of human society in the long run. It is necessary to highlight citizens’ participation rights, right to know and right to speak in its prevention and control projects, and form a common public interest view to ensure its maximum value and benefit. In this regard, the government can make full use of the advantages of modern media communication, and through a series of seminars and theme days, increase the publicity of ship pollution hazards, improve citizens’ awareness of environmental protection, and guide them to participate effectively in the whole prevention and control project. Based on this, it is an important embodiment of realizing the socialist “democracy” to establish and improve the expression mechanism of public interest demands, effectively expand their channels of participating in the prevention and control of ship pollution, and safeguard their right to know, participate and speak. At the same time, give full play to the “bridge” role of social environmental protection organizations, narrow the distance between the government and the people, maximize the integration of universities, shipping companies, pollution prevention enterprises and other forces from all walks of life, and actively attract relevant professional and technical personnel to participate, expand the main body of work, and intervene with third-party supervision to ease the pressure on the government level and improve the effectiveness of ship pollution prevention and control work. In addition to the above, we should strengthen the education and training of seafarers, strengthen their awareness of environmental protection, enrich their knowledge composition, and improve the ability of all staff to deal with pollution emergency, thus reducing losses.

2.5 Green energy technology

With the development of society and the progress of science and technology, the requirements of ship pollution prevention are getting higher and higher, which also forces us to solve the problems of environmental protection and economic development. In recent years, green energy technology has developed rapidly. For example, *Jatropha curcas* oil refining replaces diesel oil. *Jatropha curcas* seeds have high oil content and oil can be used for

industry or medicine. This tree oil refining can provide 30% oil and can replace diesel oil; For example, *Salix psammophila* can be used for cardboard and paper making, and its heat content is similar to that of coal. It can be developed into a green sand coal field once every three to six years, and its power generation is also considerable; For example, cow dung is used to generate electricity. The principle of cow dung power generation is to use it to generate biogas. The cow dung power plant burns 40 tons of cow dung per hour and can generate 16,000 kilowatts of electricity. In addition to power generation, the technology of replacing oil with cow dung is also a hot application prospect. Organic methane extracted from cow dung can be added to any vehicle with natural gas as its energy source. In particular, the following technologies are expected to develop on ships in the future.

From the source point of view, hydrogen energy should be the basis of hydrogen production. The calorific value of hydrogen combustion is the highest among all fuels, and hydrogen is the cleanest fuel. The combustion product of hydrogen is water, which does not cause any pollution to the environment. Ships sailing on water are expected to use this technology on ships in the future.

Wind power generation refers to converting kinetic energy of wind into electric energy. Wind energy is a clean and pollution-free renewable energy, which has been used by people for a long time, mainly by pumping water and grinding surfaces through windmills. People are interested in how to use wind to generate electricity. On November 13, 2018, the world's first VLCC super-large tanker "Kaili" set sail, taking an important step in green shipping.

Washing tower is a new type of gas purification equipment, which is improved on the basis of the gas

purifier with floating packing layer. It is widely used in the pretreatment of industrial waste gas purification and dust removal, and has a good purification effect. For coal gasification process, gas washing is inevitable, and this unit operation is used in any coal gasification technology. Because its working principle is similar to washing process, it is named washing tower.

3. Conclusion

In conclusion, ship pollution is characterized by diversification and mobility. Once it happens, the consequences are immeasurable. As a complicated systematic project, its effective prevention and control should further strengthen the legislative construction of relevant aspects in China, strengthen dynamic supervision, gradually improve a series of basic supporting support, and guide the coordinated participation of multiple subjects. The author hopes that everyone in the academic circles will continue to pay attention to this kind of research, and put forward more effective measures from different measurement perspectives according to the actual situation.

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