Development of the emergency response measures financing in water transport

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Abstract. The article contains the results of a study on predictive risks and ideas for funding emergency measures in water transport. It analyzes the risks of accidents in water transport and prospects for funding related programs in Russia. The purpose of the study was to develop recommendations for financing measures to reduce the number of disasters in water transport. In this context, the authors studied the theory and practice of accidents involving civil water transport, identified their typical causes, and proposed possible approaches to minimize the number of these accidents. They also proposed a modern way of financing to increase the responsibility of the ship's crew and port workers. The object of the study was the risks of civil water transport disasters, and the subject of the study was ways of financing measures to improve sustainability and reduce anthropogenic disasters in water. The work is a continuation of the authors' recent study and contains proposals that can help reduce anthropogenic accidents in Russia.

1 Introduction

A careful study of the anthropogenic factors that caused disasters and accidents in water transport leads to the conclusion that it is necessary to introduce measures to prevent them by strengthening control and increasing personal responsibility for incidents, as well as more frequent updating of equipment and risk insurance for prompt and timely elimination of accident consequences. This publication is a continuation of a collective author's study on the risks of anthropogenic disasters and accidents in ensuring the sustainable development of water transport in Russia. It is necessary to identify sources of funding for the prevention and coverage of losses from human anthropogenic impact on water. Additionally, one should strive to develop methods for assessing the risks of accidents in water transport, which is possible with the use of digital technologies, but also depends on their cost and the need to find additional funds for their acquisition, installation, and application [1-11].

Among all the problems created by humans in nature, man-made accidents in water transport become especially noticeable and tangible in terms of the degree of damage and the complexity of neutralization. Their consequences are detrimental to aquatic flora and fauna, which has a negative impact on the environment, worsening human living conditions,

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depriving them of clean water, high-quality food, and worsening the air. However, the economic consequences are also dramatic: fishing is depleted, the quality of the coast is changing, nature is becoming unattractive, and the characteristics of local labor resources are changing. Regions in which man-made disasters occur on the water acquire signs of depression.

The purpose of this paper was to develop recommendations for providing funding for measures to reduce the number of anthropogenic disasters on the water and mitigate their consequences. To do this, the authors previously studied the theory and practice of accidents involving civil water transport, investigated statistics on emergency situations involving water transport from 2010 to 2021, identified their typical causes and possible approaches to minimize the number of these accidents, and proposed a modern way of financing. Then it became obvious that these means are expensive, and companies need a strategy to meet the needs of disaster prevention. The object of the study was civil water transport vessels, and the subject of the study was the financial instruments to provide them with anthropogenic disaster protection.

The complexity of studying the subject, especially its generalization, pre-determined the paucity of publications on the topic of accidents in water transport, settlement, and prevention of water disasters. Nevertheless, over the past five years, several articles have been published on the study of the legal regulation of accidents in the field of water transport [3], the quantitative assessment of accidents on ships through the use of technical supervision technology [13]. The conclusions of I.B. Druz and co-authors [5] in their local study on the impact of the operation of ship power plants on the accident rate of older ships are of great importance.

A very important proposal, although not indisputable, was the idea of assessing and tracking the social professional rating of ship crew members [7]. In addition, it is extremely interesting to study the practice of liability insurance for the captain, boatswain, and other crew members in case of accidents on ships [11]. All these ideas are very important in the search for effective methods of dealing with man-made disasters in water transport, which makes this article relevant.

2 Materials and Methods

The main research methods included the collection and processing of data from reports on accidents on civil river and sea vessels, statistics published in international reports on shipping losses and safety, information from the Federal Transportation Inspection Service (Rostransnadzor) of the Russian Federation, content analysis, and the collection and processing of information on sustainable development financing from public internet sources.

The data for the study covers the period 2010-2021 due to delays in the publication of information on investigations of water disasters. The study used annual data on shipping [2], information on the accident rate of ships at sea and inland waterways from Rostransnadzor of the Russian Federation [10], information on the possibility of issuing "green" bonds to finance the sustainable development of VEB.RF [4], and other internet resources.

3 Results

In the practice of researchers, the word "anthropogenic" means a phenomenon that is a consequence of the development of technology, the result of the application of various production technologies. Man-made emergencies include "a condition in which, as a result of the occurrence of a source of a man-made emergency at an object, a certain territory or water area, normal living conditions and activities of people are violated, there is a threat to
their life and health, damage to the property of the population, the national economy, and the natural environment" [1]. The practice of using special terminology in the field of analysis of accidents in water transport seems interesting. In the English-speaking world, the phrase "anthropogenic catastrophe" is rarely used, in contrast to "technological catastrophes" and "technological disasters". At the same time, man-made catastrophes are classified into industrial disasters, transportation disasters, pipeline breaks, and then combined with wars and terrorist attacks into a group of man-made disasters.

Technological disasters are events caused by a malfunction of the technological structure or some human error in the management or handling of technology. Technological disasters can be considered as man-made disasters, which means that they have the characteristic of an "identifiable cause".

Accidents, that is, incidents with civil water transport vessels in order to finance coverage and liquidation of damage, are classified according to two criteria (Table 1).

Table 1. Classification of emergency cases (incidents) with ships of water transport.

<table>
<thead>
<tr>
<th>By severity:</th>
<th>By incident type group:</th>
</tr>
</thead>
<tbody>
<tr>
<td>shipwreck</td>
<td>navigational emergencies</td>
</tr>
<tr>
<td>accident</td>
<td>technical emergencies</td>
</tr>
<tr>
<td>emergency incident</td>
<td>explosions of combustible gases</td>
</tr>
<tr>
<td>operational damage</td>
<td>fires due to various internal causes</td>
</tr>
<tr>
<td></td>
<td>without crew fault</td>
</tr>
</tbody>
</table>

In the theory and practice of shipping, there are many old proven and innovative methods to reduce the number of disasters on the water, as well as reduce and neutralize their negative impact on the environment. Summarizing them, we can confidently say that they work with a mandatory combination of high responsibility and professionalism of the staff, and with sufficient funding for preventive measures and the degree of emergency preparedness on the ground as the obligatory addition.

Despite the obvious need for these measures, it is not easy to implement them. In addition to many reasons, one of the most compelling is the lack of funding for the implementation of the entire range of activities. At the same time, budget financing is not always available and, in most cases, insufficient. A good solution could be to ensure the sustainable development of water transport through partial ESG financing.

ESG is essentially a check of financial instruments for compliance with global investment principles. If the test by all criteria gives a positive result, then such a security is in great demand among investors. In Russia, a program has been developed for the implementation of ESG projects and tools, which, in turn, must comply with the following ESG principles [9; 12]:

- the security should include not only environmental and social aspects but also management issues in the process of investment analysis and decision-making;
- incorporate environmental, social, and governance aspects into policy and practice;
- openness of information from issuers on the proper use of investments;
- adoption and implementation of the principles within the investment sector;
- improving the efficiency of implementation of the ESG principles;
- report regularly on progress made in terms of implementation of the principles and objectives.

The first steps to create a full-scale Russian "green" bond market were taken in the first half of 2019, at the Green Bonds: Prospects for Market Development in Russia conference, where participants familiarized themselves with the "green" bond market in international
practice, agreed on an interest rate: it should not be lower than the rate on deposits, developed criteria by which a bond can be considered "green".

On August 12, 2019, a sector for financing environmental and social projects called the "Sustainable Development Sector" appeared on the Moscow Exchange, which was supported by the Government of the Russian Federation, which stimulated investor interest in financial instruments circulating on it [8]. Despite the pandemic, the list of securities in this sector increases every six months until mid-2022 and is divided into 3 categories: 1) social; 2) national projects; 3) environmental or "green". The emission of instruments of the last category is carried out to finance the areas in which, according to all requirements, the fight against anthropogenic disasters on the water can also be included (Table 2).

Table 2. Potential for integrating water transport into groups of projects financed by “green” (environmental) bonds.

<table>
<thead>
<tr>
<th>Environmental (&quot;green&quot;) financial instruments</th>
<th>Sustainable planning and land management</th>
<th>Sustainable production</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For water transport</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>In the short term: “green” energy for individual equipment.</strong></td>
<td>Sustainable port and port infrastructure: - stable operation of the port; - sustainable and environmentally friendly port infrastructure.</td>
<td>Sustainable, eco-friendly operation: - cardinal decrease in accident rate; - ensuring the renewal of equipment; - ensuring the renewal of ships; - cardinal reduction of emissions.</td>
</tr>
<tr>
<td><strong>Long term: civil fleet on hybrid and “green” energy.</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 Discussion

The development of the market for domestic “green” bonds is facilitated by a number of legislative innovations that simplify not only their issue, but also reduce, with the help of subsidies and tax breaks, the tax burden for the issuer and investor. In 2019, the Government of the Russian Federation did fundamental work to develop the “green” bond market: it approved a program to subsidize coupon payments, which made it possible for the issuer to receive compensation in the amount of 70% to 90% for coupon payments. Also, 6 billion rubles were allocated from the budget through this program for 2021, which stimulated new issuers to enter the “green” bond market. A similar amount was planned for 2022. Of course, the amount cannot be accepted as insufficient, but the fact of state support for this segment of the financial market is important.

However, not only the Government of the Russian Federation contributes to the promotion of the “green” bond market. Along with it, the Moscow Exchange organizes regular meetings to discuss the market and the processes taking place on it, which contributes to the active promotion of ideas for improving and updating regulatory documents. In November 2020, the Government of the Russian Federation instructed the Ministry of Economic Development to organize a group to develop criteria for ESG projects and requirements for a verification system, prepare a plan for the development and implementation of incentive measures for the development of ESG tools [6]. At the moment, VEB RF is responsible for the development of EGS programs and tools [4].

Nowadays, the state, municipal institutions, joint-stock companies of various forms of ownership can issue “green” bonds in Russia. Until recently, Russian issuers, unlike most, for example, Chinese ones, gave priority to attracting Western investors, for which it is necessary not only to comply with ESG principles, but also to provide a plan to an
independent rating agency – RAEX-Europe, and also regularly report to it in a proper use of investments. 2022 changes the vector of attracting investors. However, we hope that the issue of sustainable development financing will remain relevant. At the same time, any issue of securities must comply with the requirements of the Federal Law of the Russian Federation “On the Securities Market” No. 39-FZ dated April 22, 1996.

5 Conclusion

Despite the pandemic and geopolitical crises, we must think about reducing the accident rate in water transport and combating their consequences because this is a matter of health not only for Russian citizens but also for life on the planet, as well as for preserving the economic potential for many generations to come. Today, we have real measures for this and can contribute to reducing the accident rate and simplifying the financing of measures aimed at this. Of course, the Russian stock market experienced a deep shock in 2022, losing foreign investors and the confidence of domestic participants. However, the resumption of operations and the gradual development of financial instruments circulating on the stock exchange with a closed foreign market right now gives a chance for a kind of "investment protectionism," when the owners of free funds are limited in choosing investment objects only by national issuers. This is how, through innovation and modernization of the domestic securities market, "green" bonds will eventually be more common in the portfolios of Russian investors, and there will be significantly more issuers.

The authors hope that their study will be useful with its new ideas and with the results of the analysis of the so-called human factor in the form of negligence, violations of rules, and the law will be properly taken into account. It is very difficult to measure for reliable inclusion in the predictive model but can be foreseen and leveled in the context of the development of digital technologies, methods for monitoring the physical condition of a person, and communication channels.

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