Solution For The Maritime Safety In The Modernization Orientation

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Abstract: The increase in maritime activity in this key area also implies the risk of accidents at sea. Recently there have been many collisions or sinking incident, fatal, causing great damage to imports and exports. What to do to best support the maritime means and minimize the number of accidents occurring on the lifeblood of the region is an urgent need for the maritime industry in general and the company guarantees maritime safety in particular.

Keywords: maritime safety, maritime activity, maritime industry.

1 INTRODUCTION

The South China Sea area, the Spratly Islands, is an important location on the international maritime route linking the Atlantic Ocean to the Indian Ocean and the Pacific Ocean. According to statistics, more than 90% of the world's commercial shipping is carried by sea and 45% of that goes through the South China Sea. The lighthouse system in the Truong Sa archipelago plays a particularly important role in ensuring maritime safety for waterways and marine industries such as fishing, oil and gas exploration and scientific research. . These are civil works to assert sovereignty, sovereign rights, and fulfill the obligations of the maritime nation set out in the United Nations Convention on the Law of the Sea 1982, the Convention on the Safety of Child Life people at sea (SOLAS). Determining strategic position, economic potential, security and national defense, right from the 1990s, the Maritime Security Branch has built five lighthouses on Truong Sa archipelago including Da Tay, Da Lat and Tien. Female, An Bang, Song Tu Tay and installed lighthouse equipment on four DK1 trusses: Ba Ke, Phuc Tan, Huyen Tran, Que Duong. By 2005, 4 more lighthouses will be built on the islands of Truong Sa Lach, Son Ca, Sinh Tôn and Nam Yet. To step by step perfect the signaling system as planned in the Vietnam Maritime Safety Development Scheme up to 2020 with orientation to 2030 approved by the Prime Minister, The key location, namely Truong Sa Dong, Phan Vinh, Sinh Ton Dong. After more than 20 years of renovation, economic potential of the sea is constantly growing. Thus, in Resolution IX, on the "Vietnam Sea Strategy" adopted at the 4th meeting of the Central Committee of the X Party Central Committee stated that by 2020, the marine economy will contribute 53-55% of GDP , and 55-60% export turnover nationwide. In reality, marine and coastal economies contribute 48-49% of GDP. This further affirms: The importance of marine economy to the country's development process, especially in the context of: The 21st century is considered by the world as "the century of the ocean". In order to successfully achieve the objectives of the sea strategy of Vietnam and at the same time to serve effectively the marine economy, the maritime safety assurance sector has increasingly affirmed its importance and key position in establishing and Maintaining a maritime safety environment, facilitating the development of trade, maritime economics and humanitarian objectives, combining security and national defense, search and rescue, coordinating marine environmental protection, contributing to Assertion of sovereignty, national sovereignty over the sea and islands.

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Image 1. *Lighthouse on the Truong Sa big island of Vietnam*

The number of ship arrivals and departures in the South East region is lower than before, about 50 turns per day, however, the tonnage of ships and cargo through the port is larger. Therefore, although the number of marine accidents occurs less but the extent of damage more serious. The objective of the maritime safety industry is to:

- To set up and maintain a maritime safety environment, to facilitate the development of trade, marine economy and humanitarian objectives, to combine defense and security protection, to coordinate search and rescue and security To protect the marine environment, thus asserting sovereignty and national sovereignty over the sea and islands in accordance with the relevant law provisions;
- To upgrade and perfect the existing signaling system, to set up signaling systems in the sea areas and navigable channels suitable to the requirements of the seaport system; establish radio navigation signaling system; synchronous investment in auxiliary production establishments, management establishments, equipment and facilities in service of management and production; Training and recruitment of labor force, striving to 2020, technical infrastructure to ensure maritime safety in our country reached the advanced level compared with the region and keep pace with the development of the world.

- To perfect the system of legal documents, standards, technical regulations as well as mechanisms and policies on assurance of maritime safety;
- New investment, upgrading and development of traditional maritime signaling system, radio navigation signaling system (RACON, RTE, AIS), marine support system (DGPS, VTS, ENC) and automatic hydrographical monitoring stations;
- To concentrate on new investment, upgrading and development of maritime signaling systems on sea islands, especially the lighthouses on Truong Sa and Hoang Sa archipelago in order to contribute to the protection of national sovereignty and sovereignty over the sea. island;
- To invest in specialized equipment and essential infrastructures in service of the assurance of maritime safety;
- To develop and train human resources capable of applying advanced science and technology in the field of maritime safety; To renovate and consolidate the organization and managerial apparatus to suit the tasks in each stage of development;
- Strengthening international integration and participation in international and regional organizations on maritime safety in order to enhance the national position in the region and the world; Access to high levels of technical and development cooperation in the field of maritime safety; Strengthen international relations and international cooperation to ensure maritime safety, thus contributing to the protection of national sovereignty at sea.

2. KEY TASKS

2.1. On the construction of maritime signaling system

- To renovate, upgrade and standardize the existing lighthouse system; To build additional lighthouses in sea areas with sea economic activities, border and island areas with important positions on national defense and security; embellish the lighthouses of historical value; To add necessary items to the lighthouses in the border areas of the island to combine defense and security tasks with the affirmation of national sovereignty and sovereignty;
- Upgrading investment to standardize maritime signaling system on navigable channels;
- Installation of radar drainage (RACON) on the system of lighthouses, signaling fixed in navigable channels; Install Active Radar Reflex (RTE) on some signal buoys; installation of Automatic Identification Equipment (AIS) on lighthouse under Signaling of drainage, construction of base stations and central stations;
- Installation of monitoring and remote control equipment on signal lights on maritime channels and construction of central management stations.

The maritime signaling system has to meet following requirement: Maritime signage is a device or facility established to guide the seafarer in navigating and identifying the position of the vessel. The maritime signal's validity is the maximum distance from the observer to the signal that the observer perceives the signal to orient or position itself. The maritime signal's day-to-day validity is the maximum distance that observers can perceive to be signaled during the day; Identified with meteorological visibility by 10 knots. The maritime signal strength of a maritime signal is the maximum distance an observer can recognize the signal of the signal. The nominal maritime signal strength is the signal strength of the signal in atmospheric conditions with a meteorological distance of 10 nautical miles (corresponding to the atmospheric emission factor T = 0.74) with the spectator touch-up threshold of conventional observation by 0.2 micro-lux. The geographic visibility of the maritime signal is the maximum distance an observer can recognize the signal or light source from the signal under ideal vision conditions.

Image 2. *The maritime signaling system*

Atmospheric Transfer Factor is a measure of the intensity of light emitted by a light source remaining after it passes through the atmosphere at a distance of one nautical mile. This coefficient is determined by region on a multi-year basis. Marine lights are maritime signals that are permanently established at necessary locations along the coast, in seaport waters and in the sea of Vietnam. Signals are maritime signals fixed at locations necessary to signal navigational channels, signaling dangerous obstacles, shallow or signaling a particular location. Tunneling is a maritime sign consisting of two separate posts lying on the same vertical plane to form a fixed orientation. The spindle's axis is the intersection of the vertical plane passing through the crater against the earth's surface. The latter is the farthest target along the axis of the target, measured from the observer in the direction of the target. The first target of the target is the nearest target along the axis of the target, measured from the observer in the direction of the target. The navigational orientation is the area on the axis of the target where the user is aware of the safe direction. The vertical angle of the pepper is the angle created by the direction from the observer's eye to the top of the pepper and the horizontal plane. Horizontal angle of the pepper is the angle created by the direction from the observer's eye to the pepper and the axis of the pepper in the horizontal plane. The lateral deviation of the divergence is the maximum distance along the line perpendicular to the axis of the divergence that the ship can deviate but not out of the

direction of the divergence. Flow notification is the common name of the two-sided signaling, flow directional signaling, azimuth signaling, isolated obstacle signaling, safe water signaling and specialized signaling. Floating Signals are maritime signals designed to float on the water, anchored or anchored in a certain position. Lightning is light in which the total light time in one cycle is shorter than the total darkness and the flashing time is equal. Lightning is lightning in which all light periods and dark times are equal. Long flashing is a flash in which flashing time is not less than 2.0s. Fast flash is a flash in which flashes are repeated at a frequency of 50 to less than 80 times per minute. Very fast flashing is light in which flashes are repeated at frequencies of 80 to less than 160 times per minute. Single flash is a flash in which a flash is repeated at regular intervals less than 50 times per minute. Blinking light is a light emitted in groups with a defined period. Maritime AIS is a radio signal that transmits maritime safety information to AIS stations installed on board, operating on VHF maritime frequency bands. Racer radar is a maritime signaling device for receiving and transmitting radio signals over maritime radar frequency bands. Nominal nominal sound signal (P n) is the distance that in foggy weather conditions, seafarers can hear the sound signal of the signal with a probability of 90%. The commonly used term of the acoustic signal (Pu) is the distance in which fog weather can be heard by the seafarer at a probability of 50%.

2.2. On the development of marine support instruments

- To set up an electronic navigable channel chart on the navigable channel from the "0" float to the wharf to serve the management and operation of the navigable channel and issue a maritime notice;
- To build a new navigational traffic control system (VTS) on the high-density channels of vessels in and out of the sea, with complicated maritime conditions and high risks of insecurity, Hon Gai - Cai Lan, Hai Phong, Da Nang, Dung Quat, Van Phong, Cai Mep - Thi Vai, Can Tho - Tra Vinh;
- Build DGPS stations in high-density navigable maritime areas such as Hai Phong, Quang Ninh, Da Nang, Dung Quat, Van Phong, Sai Gon, Vung Tau, Cai Mep - Thi Vai.

Maritime navigation from the sea into the port, the right is the right of the channel, the left is the left channel. Maritime navigation at sea, direction is determined as follows: In the direction from North to South, the right is the right of the channel, the left is the left; In the east to west direction, the right side is the right side of the channel, the left side is the left side of the channel; The dominating side of the maritime signal; In the direction of the navigational channel, the signal on the right controls the right of the channel, the signal on the left controls the left channel. By geography: Northern controlled from 315^o to 45^o; The east is controlled from 45^o to 135^o; The south is controlled from 135^o to 225^o; The West is controlled from 225^o to 315^o.

2.3. On the construction of work items, equipment and other tasks

- To renovate and upgrade a number of stations in charge of navigable channels, which lack the necessary items for station operation; To build new management stations for existing channels, newly invested streams without management stations;
- To build a system of hydrographical station monitoring stations in important maritime areas with high density of ships and boats, with complicated hydrographical regime such as Quang Ninh, Hai Phong, Nghi Son, Cam Ranh, Nha Be, Thi Vai, Ganh Rai Bay, Tien River, Hau River, Nam Can. Measure wind direction/wind speed, air temperature/humidity, rainfall, solar radiation; Combined with Rosette & CTD seawater sampling and analysis system: temperature, depth, conductivity, salinity, ... All data of meteorological and satellite sensors are automatically retrieved and stored in the data logger in conjunction with the onboard control system to display, analyze and exploit live data in real time.
- Investment equipment and software multi-beam survey (Multi-beam); RTK equipment and software; equipment and software Side-scan-sonar; software package navigational channel electronic navigation; Maritime Signaling Management Information System, Maritime Notice Information System;
- To renovate and upgrade existing operators, to build new operating offices of the companies and enterprises in service of the work of maritime safety; renovation and upgrading of guest houses in Vung Tau; To build new guest houses, to replace shifts in Hai Phong, Nghe An, Da Nang, Nha Trang and Can Tho;
- To invest in additional means and equipment. Ships, survey canoes, buoys, canals, high speed canoes, supply vessels inspect the Truong Sa archipelago, dredge retreading ships, motorized vehicles, construction equipment Construction of mechanical engineering works and equipment for maritime safety activities;
- To supplement the maritime safety workforce; training to improve the level of managers, technical staff; professional training for technical workers to meet the requirements of management and operation of advanced and modern maritime signaling;
- To review, amend and supplement the system of legal documents, standards, technical regulations, mechanisms and policies for the development of maritime safety.

Strive to ensure that the maritime safety of Vietnam meets the requirements of the World Maritime Organization and the World Lighthouse Association for Maritime Safety in 2030; To strongly apply information technology to the operation of maritime safety, to provide maximum support for maritime safety for sea-going ships and waterway vehicles operating in sea areas and navigation routes. Investing, establishing control systems, remote monitoring, automation of traditional maritime signaling systems; To intensify the inspection, protection, supervision and repair of the maritime signaling system, to reduce the personnel for management and operation of the maritime signaling system; To invest in modernization and modernization of auxiliary production establishments in service of operation, meeting the requirements of maritime safety assurance. Continue to invest in building lighthouses for national defense and security in the Truong Sa and Hoang Sa archipelagos and the border areas and islands so as to assert sovereignty and national sovereignty over the sea and islands. To step by step transfer current shipping lanes managed by branches and localities to the Ministry of Communications and Transport for unified management and promotion of the efficiency of maritime navigation infrastructure. To perfect the specialized legal system on maritime safety; To improve the quality of

recruitment and training of human resources to ensure maritime safety and raise the level of managers and technical workers on a regional basis to meet the requirements of managing and operating the reporting system. modern maritime brand.

3. SOLUTION

To perfect the system of legal documents, standards and technical regulations in the field of maritime safety in order to perfect the legal system as a basis for the development of marine navigation safety; To formulate a mechanism to mobilize capital sources and other preferential mechanisms and policies for the effective implementation of the Scheme; Strengthening the information on maritime safety in Vietnam's seas, asserting sovereignty and national sovereign rights at sea; Propaganda to raise public awareness of the location and importance of maritime safety activities; Awareness of the use and protection of maritime safety infrastructure; Strengthening the training to improve the capacity of personnel in the management, exploitation and use of marine navigational safety infrastructure; To study and apply scientific and technological advances in the management, operation, design, manufacture and manufacture of maritime signals; Strengthening the coordination of activities to ensure maritime safety between the Ministry of Transport and the relevant ministries and branches; Enhance international relations and international cooperation in maritime safety activities. Although still able to do the task, the requirements of the new situation, the system of marine lights, maritime signals existing for decades must also be modernized. Accordingly, this system must be capable of controlling, remotely monitoring, supplementing, enhancing marine support tools for seafarers, such as automatic identification AIS, VTS management system ships Marine, ENC electronic chart enhances the ability to manage and mitigate the risk of marine equipment ... towards establishing an electronic marine environment. This is the number one priority solution to a total of 13 solutions to ensure current maritime safety. However, this requires huge capital investment due to high equipment costs, if equipped with AIS system for 600 maritime signals, 50 lighthouses now cost millions of dollars. Mass production system is a very high input price, but we also have localization solutions, self-study, production, towards the same international technical features, continue to 2015 research dynamic system, then 2-3 years implementing that system, and continue to transfer to the member units. At the same time, improving the quality of surveying, deepening dredging channels, ensuring the depth of the channel for ships of ten thousand tons into safe seaports is a sustainable solution. In order to improve maritime safety, there should be comprehensive solutions on the state management of maritime navigation, the coordination between maritime safety, maritime port and related units in the work. Managing the navigable channels and seaports, raising the sense of responsibility to navigators and owners are carried out. In addition to the management and operation of the maritime signaling system well in accordance with the standards published by the navy, the depth survey will also be carried out in a timely manner and disclosed to the public. Seafaring communities use the best services thus reducing the risk of unsafe security. For the crossroads of the sea, Ganh Rai Bay - the economic development area should have solutions to stream flow, more strict rules and regulations, the means of itinerary here, especially with the means inland waterways for improved navigational safety. Hopefully with the above-mentioned solutions, this year, Vietnam's maritime safety assurance branch not only assists the ship with safe navigation, but also conducts ships in and out of ports. As a result, the flow of luong lanes contributes to the creation of a maritime safety environment for the marine economic sector of Vietnam.

4. CONCLUSION

To improve the level of infrastructure to ensure maritime safety, meet the requirements of marine economy development and IMO requirements, IALA recommendations as well as international conventions that Vietnam participates. This is the enthusiasm of many years of maritime guarantors. Currently, our country has 39 routes, including some of which have curved lines with small radii, causing difficulties for navigation. Sai Gon - Vung Tau, and Quy Nhon fairways have a minimum bore radius of 500m. Mainstream streams are one-way flows. Only some Dung Quat, Quang Ngai, allows 2-way navigation under limited conditions. The navigational navigation system is relatively full with 918 maritime beacons and 134 maritime vessels. However, there are too many types of signals that make it difficult to manage the operation as well as maintenance and repair. The signaling device is outdated, not yet equipped with remote monitoring equipment and other radio signaling devices. Some lanes have not yet installed night-time signaling equipment. Thus, the modernization of maritime safety systems is very necessary

REFERENCES

[1] http://vov.vn/kinh-te/bao-dam-an-toan-hang-hai-theo-huong-hien-dai-hoa-322700.vov

[2] www.vinamarine.gov.vn/Index.aspx?page=about&tab=lspt

[3] http://www.mt.gov.vn/vn/tin-tuc/34827/lich-su-70-nam-phat-trien-cua-nganh-gtvt-viet-nam.aspx

[4] https://thuvienphapluat.vn/van-ban/Giao-thong-Van-tai/Quyet-dinh-1166-QD-TTg-phe-duyet-De-an-phat-trien-bao-dam-an-toan-hang-hai-130992.aspx

[5] Nguyen Minh Quy (2008). "Risk and Simulation - Based Design of Approach Channel". Delft University of Technology, the Netherlands.

[6] Pianc (1997). "Approach channels - A guide for design" International Association of Ports and Harbors.

[7] Thoresen, c. A. (2003). Port Desĩgner's Handbook: Recommendations and Guidelines, Thomas Telíbrd Publishing Ltd, Heron Quay, London E14 4JD.

[8] Wsace. (2006). "Hydraulic Design Guidance for Deep-Draft Navigation Projects" U.S. Army Corps of Engineers, Washington, DC.

[9] Webster, c. (1992). Shiphandling simulation application to waterway design, National Academy of Sciences, United States of America.

[10] IALA Guideline No. 1062 On The establishment of AIS as an Aid to Navigation.