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A Study on the Safety Protection of Maritime Rescuers

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Abstract

The rescue system and the maritime rescue system are the two main components of our rescue system, one of the main components of international rescue work is the maritime rescue work. The rapid development of the economy and science and technology has given an important impetus to the development of the maritime industry in China, but the risk to the lives of those working at sea is greatly increased by the fact that external natural conditions can largely restrict and affect the work at sea. The orderly implementation of rescue work at sea requires the effective cooperation of society and various organisational sectors. We must pay attention to rescue work at sea to improve a strong guarantee for the safety of people's lives and property. The research paper is a study of the safety protection of maritime rescuers. The main purpose is to improve safety protection of rescuers in scientific methods and suitable safety protection articles when conducting rescue tasks. The concluding chapters described the results of protection in rescue environment and rescue operations. A number of recommendations are made concerning the need for further investigation in the subject.

Keywords

China Rescue, Safety Protection, Rescue Environment, Rescue Operation

1. Introduction

The initial rescue boat of China appeared in Song Dynasty and named Official Ferry Boat. The Official Ferry Boat belonged to the government for ferry transportation of business men and shipped their cargo from south area to north area. The rescue responsibility of the official ferry boat is their partial job [1]. Subsequently, the “Red Rescue Boat” emerged at the end of Ming Dynasty, the “Jingkou Rescue Organization” and “Jiaoshan Rescue Bureau” appeared during the Qing Dynasty. They were all non-governmental organizations and the priorities were to rescue people trapped in the sea or river of the wrecked ships. Although the initial stage was non-professional both on equipment or working strategy, all of them were the bases of the rescue development of China and it proved that rescues at sea already existed in China several hundred years ago [2].

2. Risk for Rescuer from Rescue Environment

2.1 Heavy Weather Influence on the Rescue Boat and Crew

It is in most of time that rescuers engaged in rescue operation are required to operate under extreme weather conditions. When things start to go wrong in these conditions, they will happen so quickly and may con-spire to make the rescue task even more difficult. The rescuer must be prepared for heavy-weather operations at any given time. This section will introduce a basic understanding of the influence taken from the different rescue environment for the rescue boat and crew [3].

2.2 Poor hydrology Influence on the Rescuer

Reef area is the dangerous region of numerous islands, beaches and reefs. There are 6500 islands which is 500 square meters located in the coastal lines of China. The distribution of reef area is very wide and with the following characters: navigation waterway is narrow and winding, there are a lot of reefs and shallow beaches near the navigation waterway, the speed of current are large with the complex directions [4]. To conduct rescue operation in such dangerous water aimlessly will leads to the stranding and touching of rescue boats itself. Moreover, it is not easy to control rescue boats because of the influence of the large current speed, fast current and eddy, and these factors lead to the collision accident between the rescue target. Such situation will not only damage the rescue operation but also destroy the rescue boat itself.

3. The Risks for Rescuer During the Rescue Operations

3.1 Risk of Towing Operations

Every towing activity is potentially dangerous. Towing should never be considered “routine”. Knowledge of principles and standard procedures should be applied to account for weather and sea conditions, vessel types, and crew experience. The tow should always be within the crew’s and vessel’s capabilities, otherwise there are still dangerous when to tow a grounding ship in good weather conditions. The safety of the crew and the crew of the towed vessel is more important than property, and the primary responsibility in any towing situation is to maintain safety. Towing mishaps can be prevented by honestly evaluating risks involved in every step of any towing evolution. Communicating with the towed vessel’s crew who may have important information necessary to complete a successful mission is essential [5-6].

3.2 Risks of the Afterdeck Operation of Rescue Tugboat

Under the circumstance of big storm, rescue crew work on the after deck of tugboat is easy to be influenced directly by the wave such as striking and rolling. The wave will strike the afterdeck directly, and then make it soaking intermittently and wet and smooth due to the low freeboard of the rescue tugboat afterdeck. Moreover, the wave will strike the rescue crew’s body directly and knock them down, or even throw them at the hard stuff which located at the afterdeck.

3.3 Risks of the Engine Room of Rescue Tugboat

The engine room is a special working environment. Firstly there are many hard stuffs because of the machines are made of metals. Secondly there are numerous high speed equipments such as main engines and auxiliary engines. Thirdly the temperature of the engine room is about 40 centigrade degree. Furthermore, the center of gravity of the rescue tugboat is lower than the normal merchant ships, and the shaky frequency of the ship is higher. So the rescuer is hard to control the stability of them, especially in the storm. The above situation is a challenge for the crew checks in the engineroom [7].

3.4 Risks of Operation of Rescuing Dangerous Cargo Ship

It is well-known that the dangerous cargo ships are the ships which transported the dangerous goods, such as oil tank, LNG ships and chemicals goods ships. The dangerous goods have the nature of burning, explosion, erosion, toxic and releasing radioactivity, and it is easy to cause casualties, property loss if dealt with improperly or if accident happening. There are all kinds of dangerous goods with different natures and dangerous levels. Moreover, most dangerous good shave more than one type of dangers. Once the accident happened on the dangerous cargo ships, i.e. fire, explosion, collision and grounding etc., there are more difficulties and higher level of danger for the rescue boat and crew during the rescue operation. However, rescue operations have to be done even if there is only one distressed person left in the wrecked vessel. Therefore, ships shipping dangerous goods are the most difficult and dangerous rescue target, and this part of the dissertation analyzes the unsafe element of the dangerous goods ship rescue operation.

3.5 Risks of Air Operations

Coordinated operation between rescue boats and aircraft is a latest part of rescue operations. While an aircraft can generally search an area faster or may reach on-scene sooner, a vessel can investigate more thoroughly and usually provide more direct assistance. Whether a pollution incident or a rescue case, boats and aircraft may be called upon to work as a team. Boat operations with aircraft usually involve transfer of a person or equipment between a helicopter (rotary-wing) and a boat. Sometimes, a boat must coordinate with a fixed-wing aircraft.

The main function of helicopters including hover; deploy rescue swimmers/EMTs or civilian divers; perform winch using a rescue basket, stokes litter, or rescue strop; deliver equipment (e.g., dewatering pump and fire suppression kits) when available; deploy datum marker buoys; search with radar; provide night illumination; direction find; perform multi-mission patrols; conduct supply/replenishment operations. The author will focus the risk of air operation on the heli-

copter winch operations, hoisting and helicopter salvage and towing in this research paper due to their high risk levels.

4. Analysis of the Present Protection Measures of Rescuer in China and the Rising Problems

4.1 Safety Protection of the Rescuer in the Dangerous Rescue Environment and Some Rising Problems

Dangers coming from the rescue environment for the rescuer have already been introduced in Chapter 2. The casualty of the rescue crew and the damage of the rescue boat both affect the rescue operation and the national wealth. Rescuers should pay enough attention to their own safety to make sure that they could conduct the rescue operation without troubles.

4.2 Safety Protection Measures for the Rescue Operations

Overcome the effects of static forces by starting a tow slowly, both on the initial heading or when changing the towed vessel's heading. A large amount of strain is placed on both vessels, their fittings, and the towing equipment when going from dead-in-the-water to moving in the desired direction and at the desired speed. Specifically, to start the tow on the initial heading, perform the following procedures: apply the towing force on the initial heading to gradually overcome the towed vessel's inertia; as the towed vessel gains momentum, slowly and gradually increase speed; to change the tow direction, make any change slowly and gradually after the towed vessel is moving. Furthermore, to change the towed vessel's heading, perform the following procedures: apply the towing force perpendicular to the vessel's heading. Once the towed vessel starts to turn, resistance will develop; apply turning force slowly and gradually; tow in the desired direction and gradually overcome inertia to get the towed vessel moving forward; once making way, the effects of static forces lessen; until the tow achieves a steady speed and direction, apply power or turning force to defeat any remaining inertia or to change the towed vessel's momentum gradually.

5. Possible Solution to the Rising Problems via Learning from the International and Domestic Latest Safety Protection Methods

5.1 The Domestic New Fabric Application

The domestic new fabric when put into use on the rescue protection working clothes will make the working clothes windbreak in winter and heat insulation in summer. Such new fabric is made of the PTFE film via two-way stretch with a special cellular structure. It is water proof due to the numerous cell distributed on the film of the fabric, and the diameter of the cell is one of the 20 thousand of the water-drop. It is wind break and heat insulation because of the cell is very tiny and its irregular rank. Therefore, the new fabric with these characters is suitable for the working clothes of the rescue crew who is working in the heavy weather. The working clothes with such new fabric will protect the rescue crew in the storm, cold weather and heat weather, finally reduce the influence of the navigation environment on the rescuer.

5.2 The Application of the New Types of Safety Belt

New types of safety belt HD-SZD-I, is useful for the safety protection of the rescue crew working on the deck in the storm. Firstly, the belt can be pulled out at will and the crew can move up the belt to take back the automatic controller when they are finishing their job at the fixed location, so, the new types of safety belt will not limit the action of the rescue crew. Secondly, the automatic controller will instant lock when the safety belt is impacted by the force, and then the shock absorber will lease the belt slowly to protect the rescue crew. In other words, the rescue crew will not fall into the sea when they are stroke by the wave, and the strike force will be reduced by the safety belt. Therefore, it is better to apply such safety belt on the rescue crew working on the deck of the rescue tug boat in the storm.

5.3 Risk Assessment Methods on the Poor hydrology and Rescuing Dangerous Cargo Ship

The Methods of Crew Rest and Utilization from British Coastal Guard detail one example of how formal safety assessment methods can be applied to Rescue Boat, equipment and procedures. The methods mentioned adhere to the International Code of Safety for High Speed Craft - HSC Code (International Maritime Organization, London 1995). Other recognized systems for conducting risk assessments may be used, as appropriate.

6. Conclusion

In conclusion, China Rescue plays a significant role in shipping economy. Although new rescue reform started late, the noble spirit of rescue made rescue enterprise dramatically improved. However, as a special force and wealth of a country, Chinese rescuers need to be protected. Good protection of rescuer needs not only suitable and effective protective articles but also scientific methods of risk assessment. It is important for the future development of China Rescue to

find out new problems of safety and resolve them. Good protection on the safety of rescuer may increase the confidence of rescuer to made decisions resolutely and carry out rescue task bravely, ensuring rescue task performance effectively and increasing rescue mission success rate, so that rescue spirit with Chinese characteristics can be carried out in rescue operations. Furthermore, good safety protection of rescuer gives expression to the idea of focusing on people. Therefore, it is time to take actions to protect rescuers to ensure the rescue and shipping enterprises maintain a momentum of healthy development.

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