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### ISSUES OF SHIPBOARD OCCUPATIONAL SAFETY AND SEAFARERS' LABOR PROTECTION

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**Abstract.** *Any vessel, regardless of its purpose and displacement, is a high-risk area, so special attention is paid to occupational safety on ships. Knowledge of and compliance with occupational safety and health standards and regulations is required during any production process on board or during routine operations necessary to ensure the vessel's functioning in accordance with its intended purpose. Any violation of the safety of the production process leads to harm to the health of the ship's crew. The high level of injuries on ships requires finding key solutions to this pressing problem. By analyzing official statistics on injuries to crewmembers, accidents and emergencies during shipboard operations and studying the reasons that led to this, we have concluded that the study of this topic is an urgent need with a certain degree of relevance and a number of unresolved issues.*

Working at sea attracts people with romance and stories of experienced sailors, but it also puts them off by the not always easy working conditions and time away from home. However, while some people are deciding whether they are ready to radically change their lives and join the ship, others are actively filling out questionnaires and passing interviews at crewing agencies.

It is necessary to be prepared for the physical exertion of this job, and often a seafarer has to work for more than 12 hours without days off and holidays. There are also factors such as constant motion sickness, climate change, and time zone

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changes. One must face reality and understand that such work can lead to serious consequences and injuries, especially if safety rules are not followed. Also, it is important to realize that seafarers are separated from their families for about six months. Problems with personal safety or the vessel's passage through high-risk areas, so the risk of being attacked by pirates should not be ruled out. Merchant ships cannot store weapons, so seafarers are practically defenseless in the event of an attack. A ship is a confined space, so you have to constantly stay in a limited area and, despite the fact that they are often very well equipped, the ship is surrounded by the sea on all sides. Finally, working at sea means constant learning, where one of the peculiarities of working on a ship is the need to undergo regular retraining and improve professional skills.

Injuries on ships have always been a pressing issue and remain an urgent problem today: no matter how the shipping industry changes, no matter what technological innovations ships are equipped with, sailors still suffer severe injuries and die on board. Crewmembers are provided with comfortable, convenient workwear, safety shoes and highly effective personal protective equipment for respiratory, visual and other functions. However, no matter what kind of vessels and crews they are, accidents and occupational injuries to seafarers have happened, are happening, and, unfortunately, will happen.

The European Maritime Safety Authority (EMSA) has published its Annual Review of Marine Casualties and Incidents. The report reflects the latest statistics on maritime incidents reported by the European Union countries to the European Maritime Incident Information Platform (EMCIP). According to statistics, maritime accidents have recently remained at the same level: more than 200 vessels are lost every year. The consequence of such accidents is 68% of seafarers lost their lives. Unfortunately, the situation has not been changed for the better due to number of reasons, among which the human factor dominates: insufficient competence of crews, weak control of the command staff, etc. The human factor is closely related to the technical, technological and organizational aspects of security. It is worth mentioning that along with the constant growth of shipping intensity, increase in the size and speed of ships, and the level of automation, substandard shipping still remains significant (ships over 30 years old account for more than 20% of the world's merchant fleet, and their performance characteristics are hopelessly outdated). All of this has a significant impact on accident rates.

A total of 3062 marine accidents were registered in 2022. The total number of incidents stored in the EMCIP database increased to 19500 in 2014-2022. On average, this is 3236 marine accidents or incidents per year.

In total, 106 very serious accidents were reported in 2020, which is 68% more than in 2017. However, in 2019, the number of such accidents decreased to 63. The number of shipwrecks changed in a similar way: the peak was in 2018, and in 2019 a decrease was recorded - to 21 vessels.

Between 2014 and 2022, 320 accidents occurred, resulting in 496 deaths. After a continuous, and significant, decline in the number of casualties from 2015 to 2017, a slight increase was recorded in 2018 and 2019. 88.3% of the victims were crewmembers. The largest number of people died as a result of collisions and falls. Over the period 2014-2022, 6210 people were injured in 5424 accidents. Once again, crew members were the main category of people injured at sea, accounting for 79.3% of the total.

As for the data in the country, during the first half of 2022, 11 accidents occurred on the sea and inland waterway transport of Ukraine, including small vessels, in which

no deaths, injuries and missing persons were reported. During the same period in 2021, 25 accidents occurred on the sea and river transport of Ukraine, including small vessels, in which 4 people were injured, and no one was killed or reported missing. Thus, the total number of accidents that occurred during the first half of 2022 decreased by 14 accidents (-56%) compared to 2021, and the number of injured persons decreased by 4 (+100%). A certain reason for the decrease in incidents is, of course, the hostilities that the state is suffering from that are hampering the traffic and activity of water transportation.

The aging of the global fleet and slow renewal of ships is one of the main reasons for the high accident rate and a factor that increases the likelihood of equipment failure. All of this leads to a large number of accidents at sea. For example, the analysis of the age structure of the dry cargo fleet shown in Fig. 1, shows that more than 80% of the fleet's vessels are over 20 years old, with only 50% of vessels having a service life of up to 30 years.



Fig. 1. Analysis of the age structure of dry cargo ships

Undoubtedly, work at sea is one of the most difficult in the world; so much attention is paid to the organization of practical training of seafarers. The routine operations of a ship and the professional activities of the crew confirm this. However, safety measures must be implemented not only on paper but also in real life.



Fig. 2. Deck works in adverse conditions

Perhaps one of the most important measures to prevent injuries during deck work is for the crew to be aware of safety measures. Therefore, shipping companies carry out the following procedures:

- only persons who meet the requirements set out in international conventions are allowed to work on board ships;
- crew members also receive periodic safety briefings;

- safety rules are established for workplaces and posts, which must be followed by each crew member;
- the ship's environment for people must always be maintained within the recommended limits.

Maritime transport is a reliable means of moving and transporting various goods. This is due to the fact that safety on board is of paramount importance. All crewmembers undergo mandatory training and several types of briefings. The responsibility for their conduct and implementation lies with the ship's master. The Master is obliged to familiarize the new crewmembers assigned to the vessel with the peculiarities of this type of vessel, the daily routine, job description, and emergency procedures. The newly appointed crewmember must have an idea of the location of rescue equipment, be able to use emergency kits and know all regulations clearly.

A crewmember who has not undergone an initial training on safe practices for performing his/her duties shall not be allowed to work on board. The chief mate or chief engineer who is in charge of the crew training process may conduct the training. Passengers, including adult relatives of seafarers, are also required to familiarize themselves with shipboard safety. The officer on watch is responsible for keeping a logbook recording all those who have been instructed.

All labor activities must be carried out in accordance with technological cards and instructions. They indicate the types of work that can be performed on board the vessel individually by crewmembers. Instructions for certain equipment and other technical documents (diagrams) are used for clarification.

Technological documents contain sections with information on the safe technology of performing work on board. A responsible person aboard or a specially appointed officer manages the process. To develop practical skills in the use of technical equipment and ship's machinery for various purposes, practical exercises are regularly held in the form of trainings and special drills.

In order to acquire skills, the training centers also actively use training facilities and simulation vessels. They are used to hone techniques to ensure the safety of the ship in an emergency. Seafarers are constantly monitored and supervised. Compliance with safety regulations on board a vessel requires that each crewmember be assigned certain shipboard equipment, technical and rescue equipment, documentation and facilities. The seafarer is responsible for timely checking the performance of the entrusted device, its serviceability and maintaining it in proper condition.

The duties of the person responsible for shipboard operations include:

- Have an understanding of the structure, design and principles of operation of shipboard equipment;
  - Know safe methods of performing various types of work on the ship;
  - Allocate crew members for maintenance of equipment, taking into account their basic qualifications, practical experience and years of service;
  - Conduct briefings explaining the technology of shipboard operations;
  - Be sure to address the proper use of protective equipment;
  - Regularly check the serviceability of all tools and technical equipment that may be used during the work;
  - Before starting shipboard work in closed or rarely used areas, check the atmosphere;
  - Enclose the work area with a fence or mark it with a safety sign;
  - It is forbidden for people who are not involved in the work to be inside the fence;
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- If any crewmember fails to comply with safety precautions on board the vessel, he/she shall be suspended from his/her duties.

The Master or a person authorized by him is responsible for the safety of the life and health of people under his command. He or she is responsible for personal injury situations and accidents, and must take all necessary measures to prevent them.

Seafarers are also responsible for monitoring compliance with all requirements of safe behavior and the rules for working with equipment. In case of detection of health and safety violations, the crew should immediately notify the commanding officer. At the same time, efforts should be made to eliminate them.

It is forbidden to start repair or maintenance work related to the termination of the functioning of any device without the consent of the Master or Senior Officer (Senior Engineer). A detailed instruction manual with the rules of operation must be attached next to the equipment for household use. This also applies to the canteen and laundry.

When using storm or vertical ladders, remember the principle of having at least three points of support. If necessary, use a safety belt. All gangway handrails and steps, the ship's deck and passageways should be regularly cleaned of ice, water or grease. Ensure that they are not slippery. If a malfunction is detected on the gangway, the ship's officer shall block access to it with a "no passage" sign. No foreign objects should be on the way to workplaces. Equipment packaging should be placed in a specially designated place where it will not disturb anyone. When performing work at height or involving the risk of falling overboard, all seafarers must wear safety vests and helmets and use safety ropes. A person wearing a faulty or dirty uniform is not allowed to perform shipboard duties. Repair and laundering of uniforms is the responsibility of the ship's administration. It is forbidden to wear jewelry (rings, chains, earrings) during shipboard operations. Going beyond the deck fences and bending over them is also prohibited on board.

**Conclusion.** Thus, the shipowner must provide seafarers with acceptable working conditions and respect their right to be informed about the risk, as well as to have knowledge of the level of risk of injury in each workplace and specific preventive measures aimed at reducing it. With this principle in mind, it is important to determine what requirements international conventions impose on seafarers and International conventions, which of these norms are applicable on the Ukrainian territory, how they correlate with the general norms of the national labor law. The comparative study of the mentioned norms allows drawing a conclusion about the necessity of ratification by Ukraine of certain ILO conventions or about the necessity of amendment of the conventions themselves, or the urgent need to adopt new conventions on topical issues of legal regulation of seafarers' labor.

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