ΑΕΝ ΜΑΚΕΔΟΝΙΑΣ
ΣΧΟΛΗ ΠΛΟΙΑΡΧΩΝ

Occupational Accident Prevention

ΡΑΦΤΟΠΟΥΛΟΣ ΙΩΑΝΝΗΣ
ΕΠΙΒΛΕΠΟΥΣΑ ΚΑΘΗΓΗΤΡΙΑ:
ΠΑΝΑΓΟΠΟΥΟΥ ΜΑΡΙΑ

ΑΚΑΔΗΜΙΑ ΕΜΠΟΡΙΚΟΥ ΝΑΥΤΙΚΟΥ

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<u>ΠΤΥΧΙΑΚΗ ΕΡΓΑΣΙΑ</u>

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Α/Α	Ονοματεπώνυμο	Ειδικότητα	Αξιολόγηση	Υπογραφή
1				
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ΤΕΛΙΚΗ ΑΞΙΟΛΟΓΗΣΗ				

Ο ΔΙΕΥΘΥΝΤΗΣ ΣΧΟΛΗΣ: ΤΣΟΥΛΗΣ ΝΙΚΟΛΑΟΣ

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ABSTRACT

Every single year, according to the International Labour Organization (I.L.O.) around 2.3 million people lose their lives worldwide due to occupational accidents and diseases. This adds up to more than 6.000 daily casualties. Nonetheless, occupational casualties are just a fraction of the whole equation. The I.L.O. reveals that a staggering 340 million occupational accidents take place annually around the globe. Unfortunately, underreporting is leading to a false depiction of the overall figures, which are unquestionably higher. Such shocking and alarming numbers are hard to go unnoticed. These numbers are sadly the reflection of the modern working industry and are more linked to warlike scenarios rather than the workplace itself. This dissertation aims to unravel methods of preventing occupational accidents and techniques to reduce their likelihood and impact in the maritime industry and especially onboard commerce vessels. Unfortunately, accidents are prone to occur in all aspects of one's working environment and their consequences can significantly impact both the employee and the employer. Safety in the shipping industry should be prioritized and it is of vital importance that all seafarers, irrespective of their rank and responsibilities are familiar with safety procedures, protocols, policies, regulations and guidelines mainly due to the fact that conditions onboard commerce vessels greatly differ from those onshore. Primarily, due to the fact that access to medical supplies and hospitalization onboard is particularly limited, it has to be ensured that occupational accidents are prevented at all costs. Maritime regulations and guidelines that have been introduced by various organizations and committees, in addition to company policies offer tools that can be used against the occurrence of such accidents in great effect. The following pages are divided into chapters with their own thematology and subsections that serve the main topic, for a more pleasant reading. All references that have been used for the completion of the dissertation can be found at the last pages.

Chapter I: DEFINITIONS

I.1: Introduction

Accidents are prone to happen in every aspect of one's working environment and can heavily affect the employees' physical and mental health. Similarly, to any other occupation, in the maritime industry safety risks and hazards are susceptible to frequent occurrences. Although, what distincts accidents that can potentially take place at companies onshore and maritime companies and therefore convert them into far more detrimental and risky ones, is predominantly the accessibility to hospitalisation. Irrespective of the seafarers' rank and duties, accidents can occur anytime due to the nature of the workplace environment, fatigue caused by demanding and long-lasting working schedules, exaggerated overconfidence, bad communication, lack of training and familiarization, poor understanding of safety procedures and false utilization of control measures. All of the above may result in minor or serious injuries, fatalities and illnesses. Specifically, injuries - even minor ones - and illnesses can potentially be a significant threat to the seafarers' health if they are neglected and not treated correctly. Before proceeding to analyze the prevention measures utilized to avoid occupational accidents in the maritime industry, it is deemed necessary that important terms are delineated.

I.2: Crew and maritime employment

According to international law, for a maritime employment contract to be in force and valid, a prior agreement needs to be made between the employer and the employee. The employee is to agree in participating as a member of a composed crew in a vessel's voyages. The aforementioned employee is essential to have in possession all the required documents and certifications in accordance with the provisions of STCW to prove their competence and education at the level of their rank's responsibilities. It is ought to be noted that even if a crew member does not exclusively provide pure marine labour, they are still considered a seafarer and their contract can not be terminated nor converted into a land labour one. This means that the contract will remain valid even if for any reason there is no actual voyage execution and there is no confrontation of maritime hazards. If all of the above are to be met, the contract of employment is objected to the provision of maritime labour law and the employee is legally considered a seafarer. In case an employee does not possess the aforementioned qualifications their contract is to be considered as a land contract, where the provisions of common labour law are to be applied.

I.3: Occupational accidents in the maritime industry

An occupational accident in the maritime industry is described as a work-related incident due to which the seafarer is made unable to continue carrying out their duties, regardless of whether they had a share of responsibility in its occurrence and is not intentionally caused by the seafarer. For an accident to be work-related the seafarer needs to be tied to an active and valid employment contract. The period of time required for the consequences of the accident to occur is not in relevance to the consideration of the work-related incident as an occupational one. Occupational accidents include:

- Injuries and fatalities due to the nature of the working environment
- The occurrence of an illness from which the seafarer was not previously suffering from
- Aggravation of a pre-existing illness which was caused by the continuation of the employment contract
- Incidents that can cause harm to the health of the seafarer and are legally considered as exceptional and unusually unfavourable, thus assuming the character of a violent incident.

I.4: Hazards versus risks

It is also essential to distinguish the meaning of critical terms that are often confused but have completely different definitions:

Hazard:

Curiously, the word ‘’hazard’’ has many definitions but when referring to the workplace environment it can be described as the potential source of an accident that can lead to adverse physical and psychological effects. Simply, a hazard is identified as anything that could potentially harm a person involved in a task. Falsely, it is common to mention the resulting harm as the hazard instead of the main source. According to the CCOHS, there can be found numerous categories of hazards, some of which are:

- Biological (Viruses and living organisms)
- Chemical (Chemical substances)
- Ergonomic (Nature of workstations)
- Physical (Noise, radiation)
- Psychosocial (Stress, violence)
- Safety (Equipment failure, occupational hazards)

Risk:

On the other hand, the word “risk” in the workplace environment refers to the likelihood of a harmful incident occurring due to the exposure to a hazard. Risks are calculated in a matrix that contains both the severity of the consequences and the probability of the presented hazard to actually cause harm. The identification and management of risks is the main focus of all health and safety agencies in the modern era. There are numerous factors that can affect the eventuality of a risk and will be described thoroughly in the next chapters.

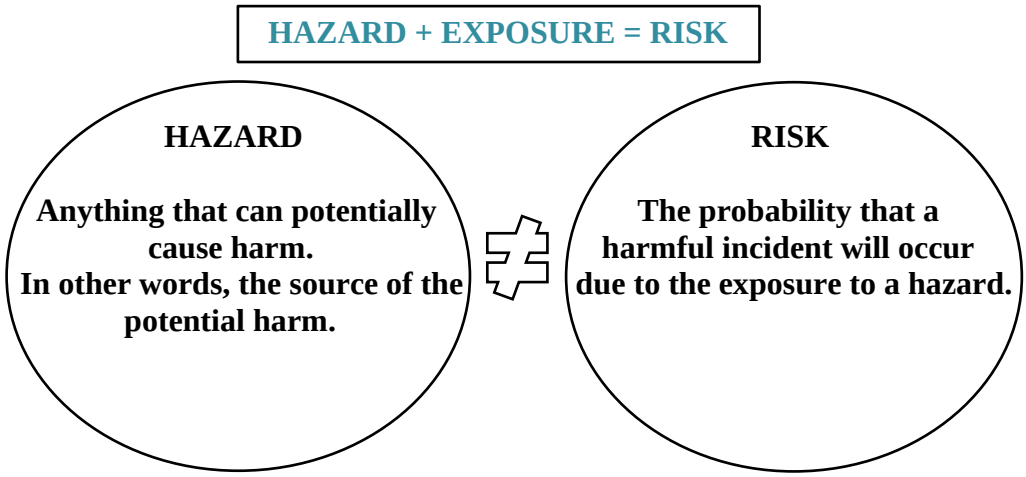
Residual Risk:

In some cases, even after the identification of a hazard and its potential risks and the implementation of all necessary control measures, the risk remains but in a less harmful state and is likely to be acceptable in order to commence a task. This term is mostly linked to risk assessment forms and can be evaluated through a similar matrix as mentioned above.

Exposure:

In the workplace environment, exposure is referred to the subjection of employees to hazards. Both the duration and the way of exposure play a crucial role in the development of accidents. The exposure typically occurs through:

- Inhalation
- Contact
- Close proximity
- Ingestion



1.The differences between hazards and risks.

CHAPTER II: CONTROL MEASURES

II.1 Introduction

By definition, control measures are the actions with the implementation of which the potential exposure to hazards is eliminated or minimized and as a result, imminent risks are controlled. A series of control measures are applied to the maritime industry's working environment as a way to protect seafarers from being exposed to various dangers of the maritime labour. Although, this mitigation of exposure to hazards and the risks involved, demand both the implementation of control measures and the development of risk awareness to coexist within the workplace. For that reason, it is of great significance that proper training is conducted regarding the identification of hazards and risks and the appropriate application of control measures.

II.2 The hierarchy of control measures

The hierarchy of control measures as depicted by The National Institute for Occupational Safety and Health (NIOSH) is an inverted pyramid that begins with the elimination of the hazard, as the most effective measure and ends with the provision and usage of personal protective equipment as the least effective way to minimize the risk involved in a hazardous situation. The effectiveness of the control methods reduces as the infographic descends.

The hierarchy of control measures is as follows:

1.Method I-Elimination: It is the most effective way to both eliminate the hazard and the risk that accompanies it. Although it may be found challenging to implement, it ought to be the first considered action. For instance, if a job is not needed to be urgently completed, it can be postponed until more favourable conditions are met.

2.Method II-Substitution: To mitigate the risk, if possible the hazard can be substituted with a less harmful one. For example, replacing a cleaning product that contains toxic chemicals with a non-toxic product that can perform equally well for the assigned work.

3.Method-III-Engineering controls: It is a combination of the two aforementioned measures and their aim is to remove the hazard before contact is made by the seafarer.

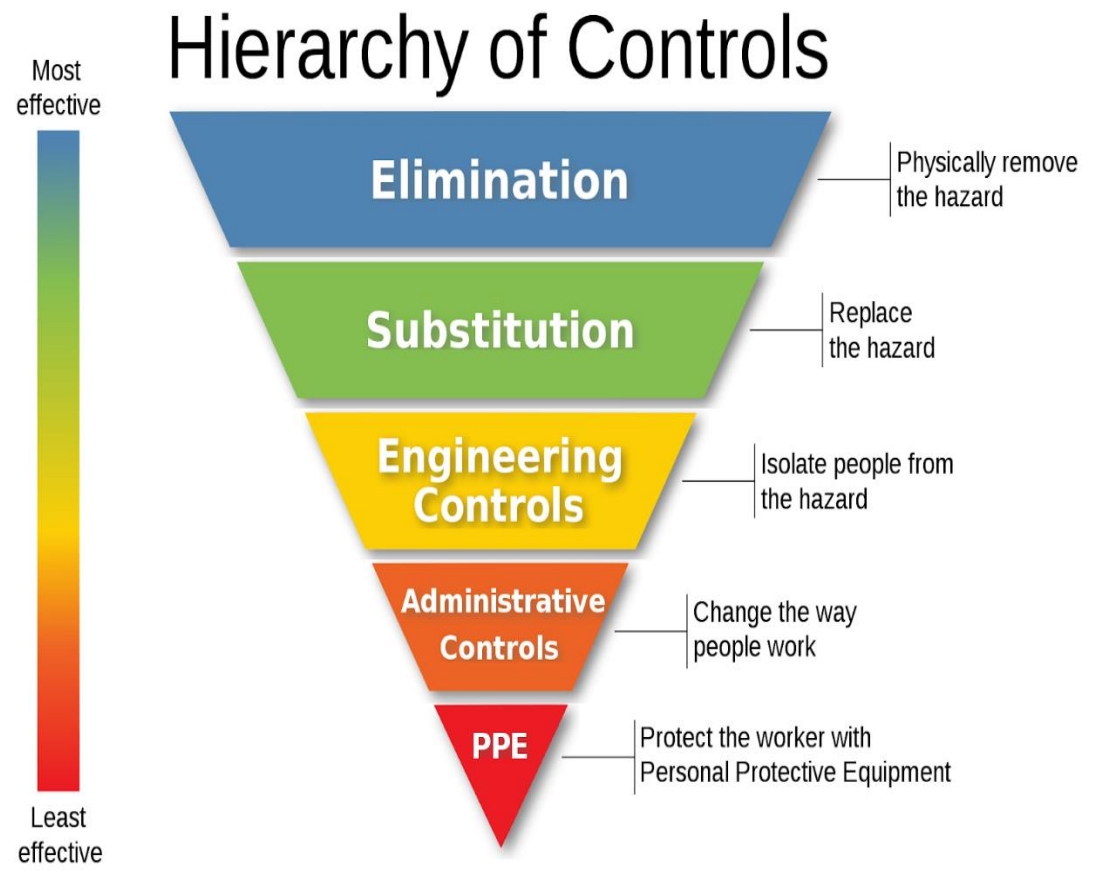
The types of engineering controls contain:

- Isolation and Enclosure: These can be accomplished with the restriction and the enclosure of the hazard, such as completely covering equipment whose unauthorized and false usage can be proved destructive.
- Transportation: Relocating the hazard to a safer environment. For example, stowing a dangerous cargo into a specified area.
- Guarding and shielding: These can be achieved with the installation of protective units such as any kind of barriers or the implementation of tightened security measures.
- Ventilation: Air, free of dangerous compounds, is vital for the working crew's health. It is essential that all areas are well ventilated and air filters are used, especially in enclosed and confined spaces before and during the task.

4.Method IV-Administrative controls: These are safety protocols and procedures which are in effect for the purpose of mitigating a seafarer's hazard exposure and for providing a safe working environment. Their aim is to establish a safe working culture inside the industry and train the seafarers to behave and work accordingly. They mainly consist of:

- Sets of policies, regulations, safe working practices and guidelines from various sources (ISM, Companies' SMS, ILO, MLC, Occupational Safety and Health agencies, and other related sources)
- Checklists of procedures
- Standards of training and certification
- Installation of safety signs
- Risk assessments
- Permits to work

5.Method V-Personal Protective Equipment (PPE): The correct usage of which can prevent injuries, illnesses and even fatalities from occurring during physical labour and hence minimize the risk involved in such tasks even though the hazard and the exposure to it remains.



2. Infographic by The National Institute for Occupational Safety and Health (NIOSH), United States Federal Agency for the prevention of work-related injuries and illnesses. The above chart can be found slightly modified in other countries' similar agencies.

CHAPTER III: ADMINISTRATIVE CONTROLS

III.1 Introduction

According to the National Institute for Occupational Safety and Health (NIOSH), administrative controls are a series of safety policies, regulations and guidelines that are implemented for the sole purpose of preventing occupational accidents. As precautionary measures, they are more successful in the prevention of work-related accidents than the last piece of the inverted pyramid, the Personal Protective Equipment (PPE). The reason for that is because administrative controls require prior time-consuming planning and management while Personal Protective equipment provides simply a physical protective measure against hazards. The seafarers are to mandatorily comply with the administrative regulations and company policies in order to establish a safe working culture that can minimize the exposure to hazards, mitigate as low as reasonably practicable the risks involved, reduce human errors and provide a safe working environment onboard vessels. Overall, the administrative controls can be proved to be cost-effective in implementing, although they require constant updates. Specifically, in the maritime industry, the administrative controls are subjected to international provisions (IMO, ISM, MLC, ILO, STCW).

III.2 International Maritime Organization

The International Maritime Organization (IMO) is a specialized agency of the United Nations which primarily regulates shipping. The concept of the IMO was firstly founded in 1948 and now consists of 175 member-states. It is mostly concerned with matters such as maritime safety and security, environmental protection and maritime legislation. The IMO establishes regulations that are mandatory to be complied with on an international spectrum. Some of these regulations that are of utmost importance are the Standards of Training, Certification and Watchkeeping for seafarers (STCW), the Safety Of Life At Sea (SOLAS) and the International Safety Management Code (ISM).

III.3 International Safety Management Code

The International Safety Management Code (ISM) is a combination of international standard regulations and guidelines regarding the safe management and operation of vessels. This code has a widespread application as it is founded on international principles providing flexibility to the establishment of a safety management system (SMS) according to each ship owning companies' needs while concurrently maintaining compliance with the mandatory requirements. The ISM Code is a compulsory set of regulations and guidelines for all passenger vessels, all cargo vessels of 500 GT (Gross Tonnage) and upwards and mobile offshore units. Moreover, it includes assessments of the entirety of the identified hazards and provides a safety management to all the applicable vessels. It was adopted by the IMO in November 1993 (Resolution A.741-18) and integrated as part of the Safety Of Life At Sea (SOLAS) Convention, Chapter IX (9). The ISM Code is made to ensure and maintain the safety of the seafarers eliminating any variances regarding the safety protocols. In order to cover the immense variety of the shipping industry, the code is expressed in broad terms so that all ship owning companies can easily conform. Upon compliance with all the requirements of the ISM Code, the Document of Compliance (DOC) is issued to the company and authorizes it to operate specific types of vessels.

The ISM requires that the applicable shipowning companies:

- Establish their own Safety Management System (SMS)
- Provide adequate safety working practices to safeguard their employees' health and safety
- Define safety roles, their responsibilities and authority
- Assign qualified personnel both onshore and sea
- Document properly all required ISM forms
- Improve familiarization and training on safety issues
- Introduce policies to prevent environmental pollution

III.3.1 Safety Management System

The ISM code sets broad boundaries so as all shipping companies to which the code applies, can establish their own Safety Management System. Depending on the field that each maritime company focuses on, the respective Safety Management Systems can greatly differ due to distinct safety requirements. That leads to the fact that each company operates with its own unique SMS that conforms to the general regulations of the ISM Code. For the Safety Management System to be in compliance with the ISM Code oughts to include at least the minimum requirements. Shipping companies have the freedom to expand their SMS according to their own administrative guidance in order to cover more safety aspects and therefore enhance their safety quality. Duplication of Safety Management Systems has to be avoided since each company encounters unique safety hazards. When both the onshore and onboard employees operate a vessel in conformation with the Safety Management System, a Safety Management Certificate (SMC) is issued to the specific vessel. It has to be noted that the SMC is only issued for each vessel individually. Both the SMC and the DOC are documents that interest all third parties involved in shipping operations and especially the charterers.

Safety Management Systems mainly require that:

- A committee that oversees safety management proceedings onshore is established while concurrently officers onboard vessels carry out their safety duties according to the Safety Management Manual (SMM) introduced by the company
- Any discrepancies that concern the responsibilities involved in safety roles and their correct performance are resolved
- Internal audits are carried out to ensure the safety of the vessel in all aspects.
- ISM compulsory regulations are complied with
- The establishment and documentation of SMS forms are conducted properly and kept in good order in the vessels' records
- Communication lines between onshore and onboard personnel are established
- Procedures for reporting non-conformities, accidents and near misses
- Policies that safeguard safety both onboard and onshore
- Policies that protect environmental pollution

III.3.2 Benefits and drawbacks of the ISM Code and SMS

The International Safety Management (ISM) Code and the respective Safety Management System (SMS) can be proved to be exceptional tools concerning safety issues in the maritime industry when implemented correctly. Particularly they:

- Identify and evaluate hazards and risks and therefore safety precautions are enforced
- Raise safety awareness
- Minimize the frequency of occupational accidents
- Insure against exposure to liabilities
- Improve the safety quality of each shipping company
- Reduce costs and human errors
- Consist of a great marketing tool

Although, nothing comes without drawbacks. Both the International Safety Management Code and Safety Management System are subjected to disadvantages, the important of which are:

- An enormous amount of documents, checklists and procedures are introduced that are time-consuming and pose an extra source of stress for those in charge
- In some cases, implementation can be proved to be challenging
- In-depth evaluation, familiarization and training require valuable resources and time
- Documents are mostly subjected to the judgement of the person filling them in and in many cases are not objective
- Implementation of procedures may be costly

III.3.3 Designated Person Ashore

According to the ISM Code, each maritime company is to appoint a Designated Person Ashore to constantly monitor one or more of its vessels in all aspects of safety and pollution prevention. The DPA must have direct communication to the high ranking management of the company and is a vital link between onshore and onboard personnel. This individual ensures that the company's vessels are operated according to the company's Safety Management System and all required resources and support are provided to the marine crew. The DPA also supervises the SMS documentation, carries out internal audits and improves the SMS of the company. Lastly, communication with this individual has to be available twenty-four hours a day, seven days a week. All communication details concerning the Designated Person Ashore are to be posted in accessible areas throughout the accommodation for all the crew to freely use.

III.3.4 Safety Audits

Safety audits are conducted regularly and are documented evaluations of the efficacy of occupational health and safety policies. It's a comprehensive examination of all safety activities onboard a vessel and the crew's understanding of safety issues. They can be proved to be cost-effective since they continuously improve the safety culture, procedures and practices onboard vessels and therefore reduce the frequency of occupational accidents. Safety audits are considered by many Health and Safety Agencies to be an indispensable part of occupational safety alongside safety awareness, guidelines and training. Their purpose is to:

- Assess the efficiency of safety activities, identify shortcomings in the company's SMS and report them back to the company's management for improvement.
- Determine the conformity with the company's SMS
- Insure against exposure to liabilities
- Increase safety efficiency

III.3.5 Near-misses

Near-misses are unplanned incidents in which no real damage or injury occurred but could have under different circumstances. They are also known as ‘’close calls’’ or ‘’near-accidents’’. Near-miss incidents are safety errors that can occur anytime in the duration of a work-related task. Near-misses and accidents share the same root causes so reporting and analyzing them can lead to great improvements in the overall safety measures and procedures. Moreover, they are cost-effective learning opportunities and provide proactive methods of preventing future accidents. Furthermore, reporting near-miss incidents lead to the employees’ participation in the company’s safety system and thus improving communication and teamwork. Unfortunately, in many cases, they are simply ignored, mainly due to the fact that no damage or injury took place. In addition to that, employees do not tend to report such incidents because of the fear of punishments. Consequently, chances for a safer working environment, are utterly lost. To counter that, an ideal reporting system has to be established that shall embrace a non-punitive culture so that there will be no fear of consequences. The company’s SMS has to introduce methods of identifying, reporting and analyzing encountered near misses. According to studies, a high ratio of reported and investigated near-misses lead to a 95% reduction in accidents. Moreover, there are about 600 identified near-misses for every serious accident. Near-misses must not be overlooked by both employees and companies. Reporting and investigating them must not be dealt with as merely another piece of paperwork because if studied thoroughly they have the ability to prevent accidents and save lives.

III.4 International Labour Organization

The International Labour Organization (I.L.O.) is an agency of the United Nations (U.N.), formed in 1919 and consists of 187 member states. It is responsible for setting and supervising international labour standards that safeguard workers’ rights on a global spectrum. The ILO has a particular interest in the shipping industry as millions of multinational workers around the world are employed in that sector. Since 1920, the ILO has adopted more than 60 maritime labour standards and working practices. Most notable of those standards are health and safety, welfare, training, minimum ages and conditions of employment. Although its greatest success came to be in 2006, as 178 state members adopted the Maritime Labour Convention 2006 (M.L.C.). ILO’s maritime-related programmes consist of the International Programme for the Promotion of Decent Work in the Maritime Industry and the Port-Worker Development Programme.

III.4.1 Maritime Labour Convention

The Maritime Labour Convention (MLC) is a convention of the International Labour Organization (ILO) that entered into force on 20 of August 2013. It is also known as the ‘’Seafarers’ Bill of Rights’’ and integrates regulations for health protection, medical care, welfare and social security protection, accommodation, recreational facilities, food and catering, employment conditions and minimum requirements to work onboard ships. The convention safeguards the seafarers’ rights to decent and humane working and living conditions and sets the boundaries for fair competition in the freight market for ship owning companies. The convention is applicable to both vessels and port facilities of all nations that have ratified it. Moreover, the convention also applies to all labour agencies that supply the maritime industry with workforce. The Maritime Labour Convention is a powerful tool for all seafarers’ and needs to be satisfactorily understood in order to provide its full protection. Non-conformities with the Maritime Labour Convention can result in hefty fines, penalties and even arrests.

III.5 Standards of Training, Certification and Watchkeeping

Standards of Training, Certification and Watchkeeping (S.T.C.W.) is an international convention for seafarers that was first adopted in 1978 and entered into force in 1984 and later subjected to amendments. It sets minimum qualification requirements for seafarers on an international status. Those minimum standards are vital for the prevention of accidents, as they include safety training courses and provide a good understanding of safety regulations to all seafarers. Before the establishment of the STCW, each nation would set its own basic requirements for the training, certification and watchkeeping for seafarers leading to great discrepancies. State members that have ratified the convention have the right to either meet or surpass the requirements that are listed in the STCW. It’s important to be noted that the convention also applies to vessels that belong to non-party states when visiting state members’ ports as a measure to ensure that no more favourable treatment is given to non-party members than the party members. This is mostly the reason why this particular convention has such a wide acceptance (99.2% of the global shipping tonnage).

III.6 Safety signs

Installation of safety signs is another administrative control measure used to indicate hazards, obstacles, locations or mandate control measures. All signs need to be written in English, but when a vessel also operates in another working language, the text used in the safety signs should also be translated and displayed in that language. There should be extreme caution regarding safety signs to passenger ships due to the fact that passengers may not be familiar with vessel hazards, obstacles and locations. Seafarers must be properly trained in order to understand the meaning of each safety sign. Ship owning companies ought to ensure that their vessels are sufficiently supplied with all the required safety signs. Both the companies and the vessel officers need to ensure that the safety signs are displayed at the appropriate designated spots.

Colours and symbols on the safety signs are vital so that personnel and passengers who are not familiar with the working language of the ship can easily understand the information that is being displayed. Charts with all the safety signs that are being used onboard a vessel alongside with their respective definitions should be posted on accessible areas around the vessel. Safety signs are to be compulsorily installed according to the IMO regulations. Their design, size and place of installation are governed by IMO standards. In case that no suitable symbol is available, proper phrasing can be used instead. They also have to be adequately illuminated and installed in such a way so they can be easily visible.

Safety signs are divided into the following categories:

1.Prohibition:

Format: Red circular band with a red diagonal bar of 45° (degrees) and white background. The act that is prohibited is depicted in black colour. The red colour must cover at least 35% of the safety sign's surface.

Definition: Stop, shut down or evacuate.

2.Warning

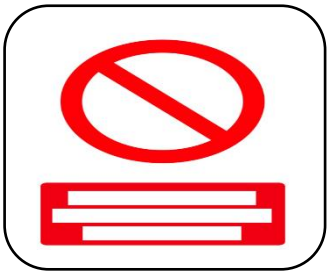
Format: Yellow triangle with a black border. The hazard is depicted in black colour. The yellow colour must cover at least 50% of the safety sign's surface.

Definition: Take precautions and be vigilant. A hazard exists and can possibly occur.

3.Mandatory

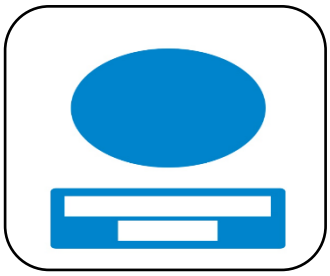
Format: Blue circle. with the precaution symbol to be taken in white colour.

Definition: Take a specific action.



3. Prohibition Sign

4. Warning Sign



5. Mandatory Sign

4.Emergency-Safety

Format: Green square or rectangle with the depicted symbol in white colour. The green colour must cover at least 50% of the sign's surface.

Definition: Emergency escapes, directions, first aid and equipment locations.

5.Firefighting equipment

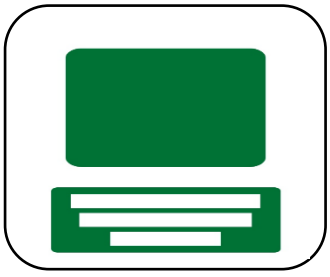
Format: Red square or rectangle with the depicted symbol in white colour. The red colour must cover at least 50% of the sign's surface

Definition: Location of firefighting equipment

6.Obstacle marking

Format: Signs, tapes and paint can be used. Their shape is rectangular and has yellow, black or red stripes with an inclination of 45° (degrees)

Definition: Warning of the existence of an obstacle. Commonly used on staircases, areas with a high risk of falling objects, manholes and slippery areas.



6.Emergency-Safety Sign

7.Firefighting Equipment Sign

8.Obstacle Marking

CHAPTER IV: DOCUMENTATION

IV.1: Risk Assessment

According to the Canadian Center for Occupational Health and Safety (CCOHS), risk assessments are an administrative control measure that identify the potential hazards and the risks involved in dangerous situations, provide an analysis, an evaluation matrix regarding the risks that accompany the identified hazards and recommend reasonable actions to eliminate the hazards or mitigate their consequences. After successfully completing the aforementioned steps, risk management can provide a safe working environment for any hazardous activities that are about to be performed. Risk assessments are generated from historical data and scientific research. They discern patterns and can contribute significantly to risk estimation and risk control. There are many different methodologies implemented to assess risks involved in hazardous situations. Some of them are either quantitative, qualitative or a mix of both. In the maritime industry, the methodology that is used in risk assessments in accordance with the IMO's regulations is called FSA (Formal Safety Assessment) which aims to improve maritime safety in all aspects. It was introduced in 1988 as a response to the Piper Alpha catastrophe, an offshore platform that exploded in the North Sea, resulting in 167 casualties. FSA's guidelines were later endorsed by both the Maritime Safety Committee and the Marine Environment Protection Committee.

The Formal Safety Assessment method, according to the International Maritime Organization consists of the following five steps:

1. Identification of hazards - What could go wrong?
A group of researchers and experts list all risks that could occur, based on evidence from past accidents, their personal experiences and assessments.

2. Assessment of risks - How bad and how likely?
The extent of the risks is evaluated according to various approaches. The evaluation is also linked to the ALARP principle (As Low As Reasonably Practicable) in which all risks are compared and controlled within appropriate limits.

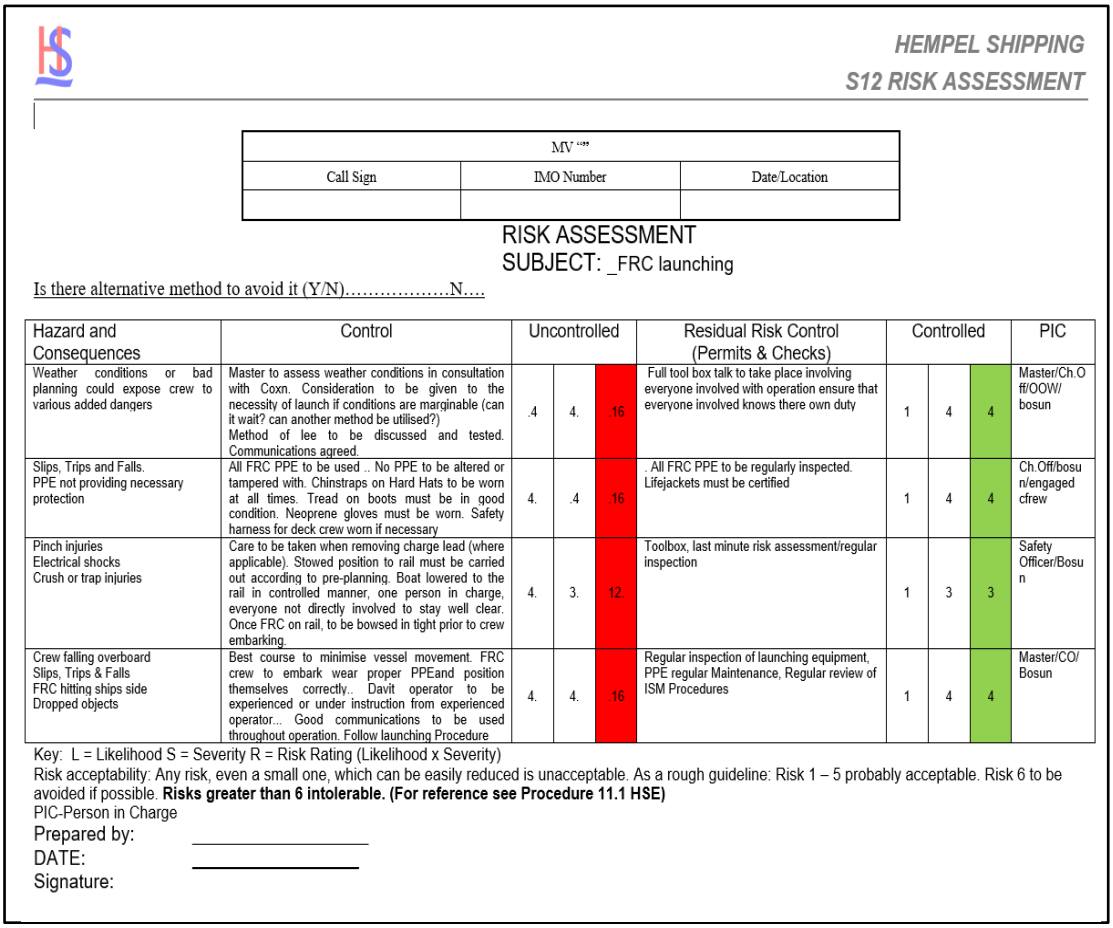
3. Risk control options - Can matters be improved?
All risks that have been identified need to be further reduced by implementing control measures. Moreover, after taking all proper control measures a re-assessment must take place to evaluate the new extent of the risks.

4. Cost-benefit assessment - What would it cost and how much better would it be?
In this step, the control measures that are about to be implemented are compared to financial criteria. Each risk control option and its respective benefit are thoroughly examined to define their cost-effectiveness.

5. Recommendations for decision-making- What actions should be taken?
This is the fifth and final step of the FSA. Based on the above, the group of researchers and experts suggest the measures that should be implemented so that the identified hazards are adequately controlled.

A typical risk assessment in the maritime industry can include but is not limited to:

- Vessel's information (Vessel's name, IMO number, Call sign)
- Date and place of issue
- All the identified hazards alongside their consequences
- Risk control measures that will reduce the risks
- The evaluation of the risks based on the respective company's risk assessment matrix
- Residual risk control measures
- The final evaluation of the risks after the implementation of the control measures
- A list of the persons in charge
- The signature of the officer in charge for the preparation of the risk assessment form



HEMPEL SHIPPING
S12 RISK ASSESSMENT

MV ""		
Call Sign	IMO Number	Date/Location

RISK ASSESSMENT
SUBJECT: _FRC launching

Is there alternative method to avoid it (Y/N)……N….

Hazard and Consequences	Control	Uncontrolled			Residual Risk Control (Permits & Checks)	Controlled			PIC
Weather conditions or bad planning could expose crew to various added dangers	Master to assess weather conditions in consultation with Coxn. Consideration to be given to the necessity of launch if conditions are marginable (can it wait? can another method be utilised?) Method of lee to be discussed and tested. Communications agreed.	.4	4.	.16	Full tool box talk to take place involving everyone involved with operation ensure that everyone involved knows there own duty	1	4	4	Master/Ch.Off/OOW/ bosun
Slips, Trips and Falls. PPE not providing necessary protection	All FRC PPE to be used .. No PPE to be altered or tampered with. Chinstraps on Hard Hats to be worn at all times. Tread on boots must be in good condition. Neoprene gloves must be worn. Safety harness for deck crew worn if necessary	4.	.4	.16	All FRC PPE to be regularly inspected. Lifejackets must be certified	1	4	4	Ch.Off/bosun/engaged cfrew
Pinch injuries Electrical shocks Crush or trap injuries	Care to be taken when removing charge lead (where applicable). Stowed position to rail must be carried out according to pre-planning. Boat lowered to the rail in controlled manner, one person in charge, everyone not directly involved to stay well clear. Once FRC on rail, to be bowsed in tight prior to crew embarking.	4.	3.	12.	Toolbox, last minute risk assessment/regular inspection	1	3	3	Safety Officer/Bosun
Crew falling overboard Slips, Trips & Falls FRC hitting ships side Dropped objects	Best course to minimise vessel movement. FRC crew to embark wear proper PPEand position themselves correctly.. Davit operator to be experienced or under instruction from experienced operator... Good communications to be used throughout operation. Follow launching Procedure	4.	4.	.16	Regular inspection of launching equipment, PPE regular Maintenance, Regular review of ISM Procedures	1	4	4	Master/CO/ Bosun

Key: L = Likelihood S = Severity R = Risk Rating (Likelihood x Severity)
Risk acceptability: Any risk, even a small one, which can be easily reduced is unacceptable. As a rough guideline: Risk 1 – 5 probably acceptable. Risk 6 to be avoided if possible. **Risks greater than 6 intolerable. (For reference see Procedure 11.1 HSE)**
PIC-Person in Charge
Prepared by: _____
DATE: _____
Signature:

9.HEMPEL SHIPPING –Risk Assessment- Fast Response Craft Launching
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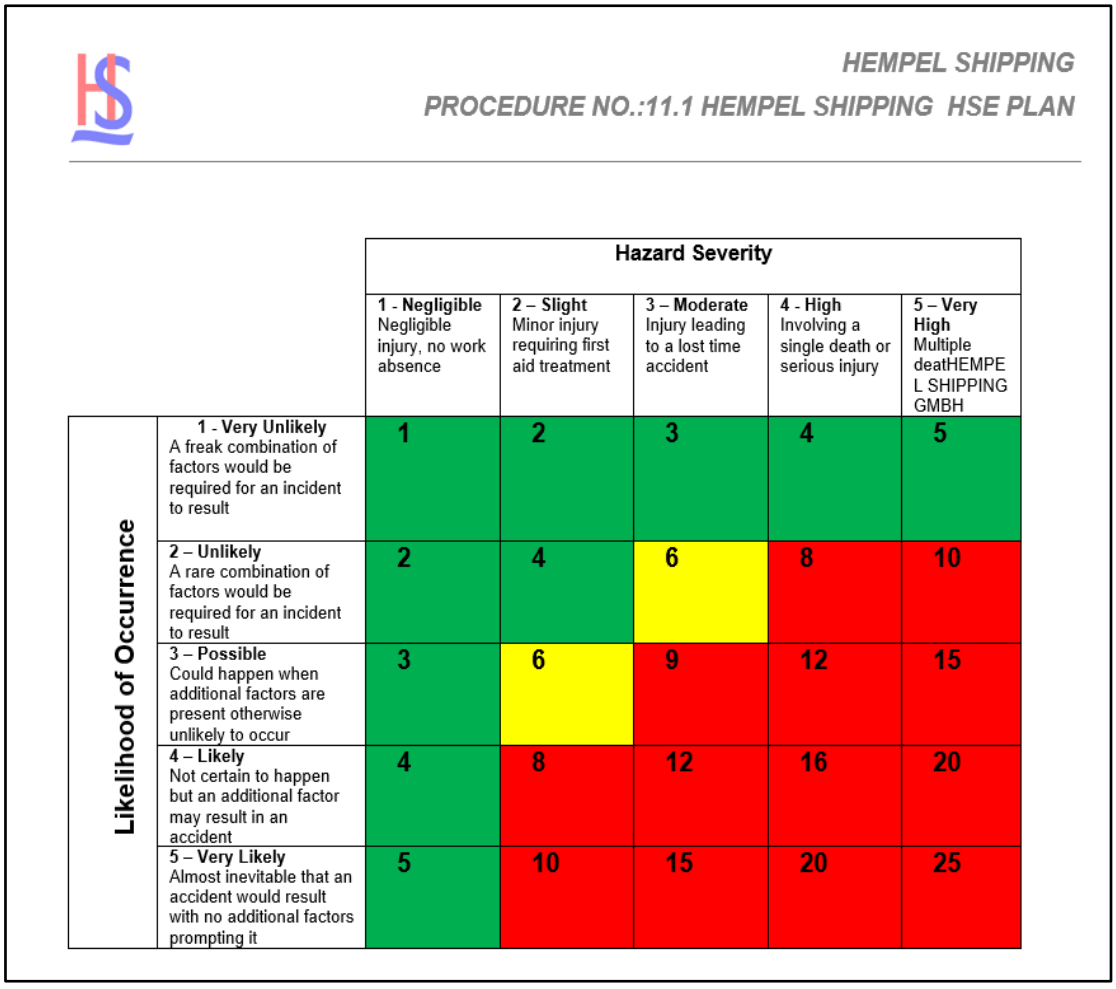
IV.1.2: Risk Assessment Matrix

It's a table of risk evaluation that is divided into two axes, one for the likelihood and one for the severity of the consequences. It is also known as ''Probability matrix'' or ''Impact matrix''. It provides fast and simple results concerning the risk estimation. The multiplication of those two axes (Likelihood x Severity) equals to the risk score or risk rating. Risk scoring can vary depending on the results of the above equation. The most common ratings that can be found in a risk assessment matrix are:

- Low or Tolerable: Acceptable and manageable
- Medium: Rigorous monitoring will be required so as the risk continues residing into ALARP limits
- High: Additional control measures must be introduced in order to further reduce the risk to ALARP limits before the work commencement
- Extreme: Unacceptable and intolerable. The work has to be postponed and redefined



HEMPEL SHIPPING

PROCEDURE NO.:11.1 HEMPEL SHIPPING HSE PLAN

		Hazard Severity				
		1 - Negligible Negligible injury, no work absence	**2 – Slight** Minor injury requiring first aid treatment	**3 – Moderate** Injury leading to a lost time accident	**4 - High** Involving a single death or serious injury	**5 – Very High** Multiple deatHEMPEL SHIPPING GMBH
Likelihood of Occurrence	**1 - Very Unlikely** A freak combination of factors would be required for an incident to result	1	2	3	4	5
	2 – Unlikely A rare combination of factors would be required for an incident to result	2	4	6	8	10
	3 – Possible Could happen when additional factors are present otherwise unlikely to occur	3	6	9	12	15
	4 – Likely Not certain to happen but an additional factor may result in an accident	4	8	12	16	20
	5 – Very Likely Almost inevitable that an accident would result with no additional factors prompting it	5	10	15	20	25

10.HEMPEL SHIPPING –Risk Assessment Matrix
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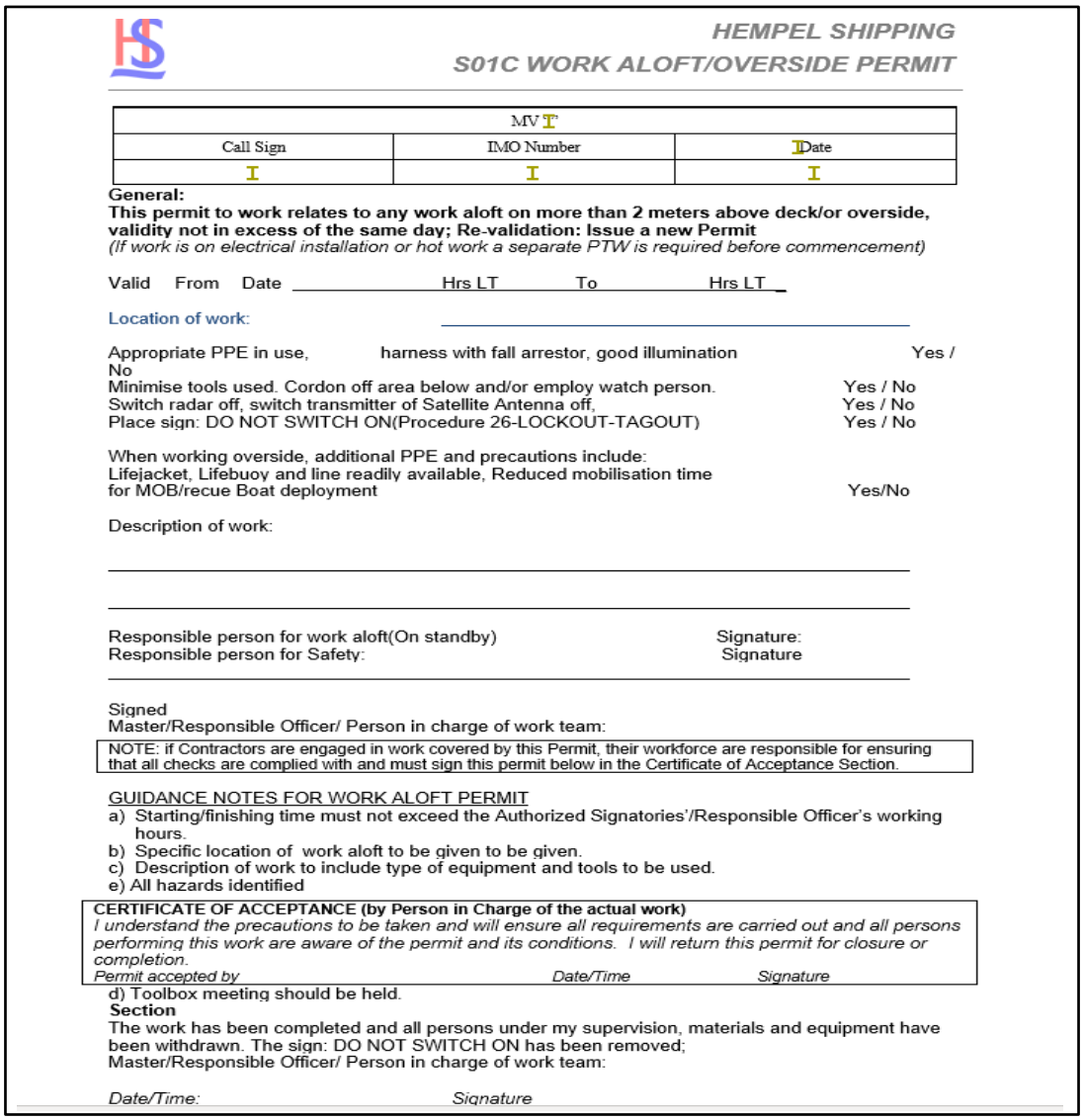
IV.2: Permits to work

According to HSE, (Health and Safety Executive), a government agency in Great Britain that is responsible for promoting, regulating and enforcing occupational health, safety and welfare and also conducting research into occupational risks, permits to work apply when a task that is about to be performed is identified as highly hazardous and hence rigorous control measures have to be enforced. This means that a prior arrangement concerning safety procedures and proper authorization has to be conducted before commencing such hazardous tasks. The permit to work is issued only for jobs that are classified as hazardous and not routine ones. It establishes safety boundaries and thoroughly analyzes step by step the work procedures and the hazards involved in order to complete the job safely. Furthermore, the permit to work is based on the respective risk assessment but should not be confused with it, as they are two distinct forms. In a permit to work document, declarations from both the workers involved in the task and the supervisor are required in order to guarantee that all parties have carefully read it. If for any reason, the permit is deemed invalid, a new permit to work document has to be re-issued. Permits to work must be kept in good order onboard the vessel in cases of inspections. Furthermore, a copy of the permits should be posted near the worksite at a visible area. More particularly, a typical permit to work onboard a vessel can include but is not limited to:

- Vessel's information (Vessel's name, IMO number, Call sign)
- Place, date and the time frame of the permit's validity
- The exact location onboard the vessel where the work is about to be performed
- The reason of work
- Prior-work preparations and a work description
- A checklist that verifies the above
- Signatures of the working seafarers, persons on standby, supervisor and master
- A certificate of acceptance
- Any special circumstances that render the permit invalid
- A section that is to be filled in and signed again by the personnel involved after the successful completion of the work

Permits to work and Risk assessments are typically required for the ensuing work categories:

- Entry into enclosed spaces
- Hot works
- Working aloft or over the side
- Working on deck with adverse weather
- Gas testing
- Tasks that involve high voltage electricity
- Operating heavy-duty machinery



HEMPEL SHIPPING

S01C WORK ALOFT/OVERSIDE PERMIT

MV		
Call Sign	IMO Number	Date

General:
This permit to work relates to any work aloft on more than 2 meters above deck/or overside, validity not in excess of the same day; Re-validation: Issue a new Permit
(If work is on electrical installation or hot work a separate PTW is required before commencement)

Valid From Date _____ Hrs LT To _____ Hrs LT _

Location of work: _____

Appropriate PPE in use, harness with fall arrestor, good illumination Yes / No
Minimise tools used. Cordon off area below and/or employ watch person. Yes / No
Switch radar off, switch transmitter of Satellite Antenna off, Yes / No
Place sign: DO NOT SWITCH ON(Procedure 26-LOCKOUT-TAGOUT) Yes / No

When working overside, additional PPE and precautions include:
Lifejacket, Lifebuoy and line readily available, Reduced mobilisation time for MOB/recue Boat deployment Yes/No

Description of work:

_____

_____

Responsible person for work aloft(On standby) Signature:
Responsible person for Safety: Signature

_____

Signed
Master/Responsible Officer/ Person in charge of work team:

NOTE: if Contractors are engaged in work covered by this Permit, their workforce are responsible for ensuring that all checks are complied with and must sign this permit below in the Certificate of Acceptance Section.

GUIDANCE NOTES FOR WORK ALOFT PERMIT
a) Starting/finishing time must not exceed the Authorized Signatories'/Responsible Officer's working hours.
b) Specific location of work aloft to be given to be given.
c) Description of work to include type of equipment and tools to be used.
e) All hazards identified

CERTIFICATE OF ACCEPTANCE (by Person in Charge of the actual work)
I understand the precautions to be taken and will ensure all requirements are carried out and all persons performing this work are aware of the permit and its conditions. I will return this permit for closure or completion.
Permit accepted by *Date/Time* *Signature*

d) Toolbox meeting should be held.
Section
The work has been completed and all persons under my supervision, materials and equipment have been withdrawn. The sign: DO NOT SWITCH ON has been removed;
Master/Responsible Officer/ Person in charge of work team:

Date/Time: *Signature*

11.HEMPEL SHIPPING – Permit to Work – Work Aloft / Overside
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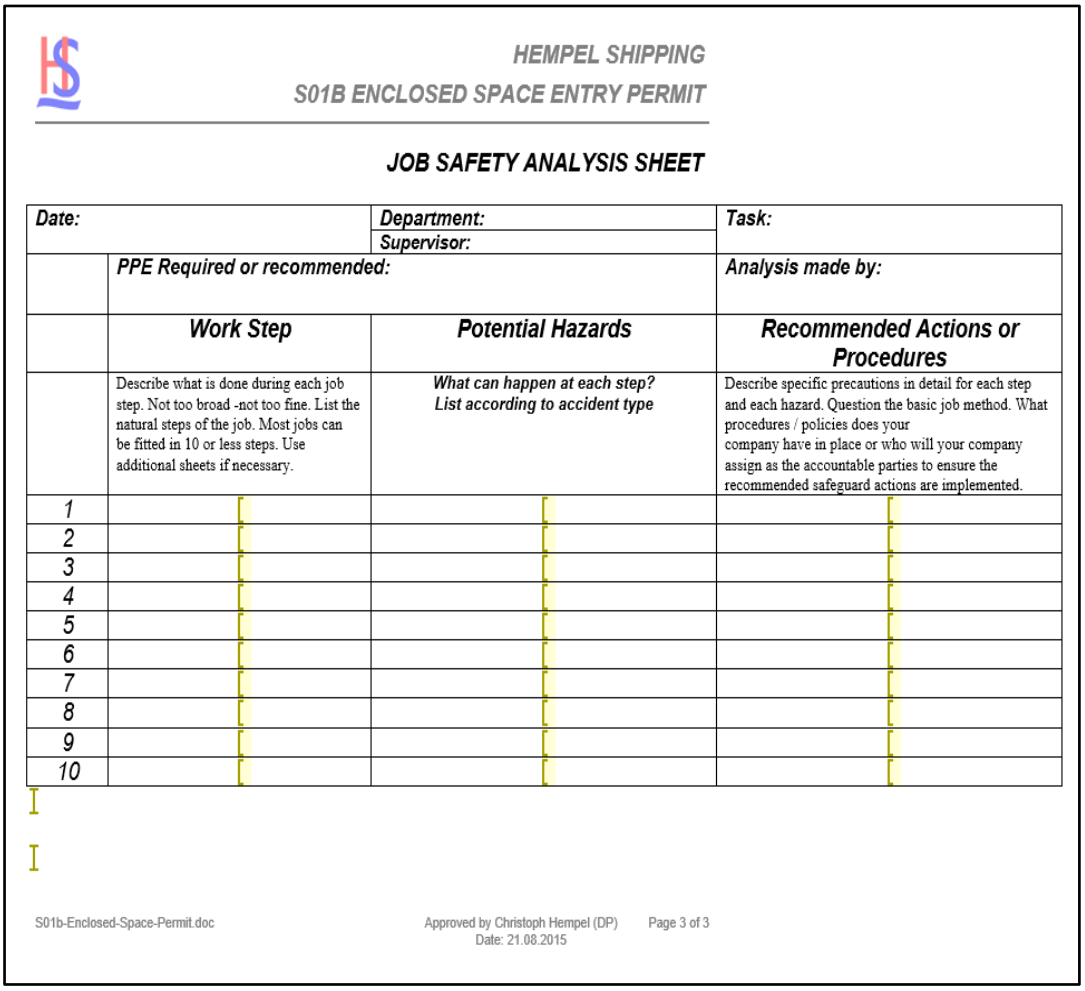
IV.3: Job Safety Analysis

According to CCOHS (Canadian Centre for Occupational Health and Safety), a Canadian government agency for the prevention of occupational injuries, fatalities and illnesses and the promotion of safe and healthy working environments, a job safety analysis is a procedure document that ensures that safety and health principles are implemented in the duration of work. JSA is also known as JHA (Job Hazard Analysis) or JHB (Job Hazard Breakdown). Another job analysis method, known as TJB (Total Job Analysis) includes the expansion of the JSA in all other aspects of the task rather than just safety concerns. JSA is utilized to further examine a specific work mainly due to the fact that risk assessments and permits to work are not meant to thoroughly analyze the work that is about to be performed in such a degree as JSAs. Generally, the work is divided into simple steps in which the potential hazards are identified. After the identification process, recommendations on how to perform the task safely are listed for each step and each hazard. This safety analysis gives a major advantage to those involved with a task since they are aware - prior to the work performance - of the exact hazards that can occur during each step and therefore are properly prepared.



HEMPEL SHIPPING

S01B ENCLOSED SPACE ENTRY PERMIT

JOB SAFETY ANALYSIS SHEET

Date:	Department: / Supervisor:	Task:
	PPE Required or recommended:	Analysis made by:

	Work Step	Potential Hazards	Recommended Actions or Procedures
	Describe what is done during each job step. Not too broad -not too fine. List the natural steps of the job. Most jobs can be fitted in 10 or less steps. Use additional sheets if necessary.	What can happen at each step? List according to accident type	Describe specific precautions in detail for each step and each hazard. Question the basic job method. What procedures / policies does your company have in place or who will your company assign as the accountable parties to ensure the recommended safeguard actions are implemented.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

S01b-Enclosed-Space-Permit.doc Approved by Christoph Hempel (DP) Page 3 of 3
Date: 21.08.2015

12.HEMPEL SHIPPING – Job Safety Analysis Sheet – Enclosed space entry
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IV.4: Familiarization

Familiarization is of vital importance onboard vessels since it significantly improves safety awareness of new personnel, introduces them to their new working and living environment and refreshes their knowledge. Familiarization should not be overlooked or considered as another part of the overall vessel's paperwork by the officers in charge. It's a stepping stone for all newcomers onboard and can be proved to be particularly useful in cases of emergencies, inspections, audits, trainings, routine duties and safety onboard. Familiarization can be time-consuming and a wearing process for the officers in charge but in the end, it is beneficial for everyone and a cost-effective method of preventing accidents on board and continuing the vessel's operations without delays. This process typically contains:

A safety orientation:

- Training on how to use and locate safety equipment (PPE, Firefighting and life saving equipment)
- How to identify alarms
- Locating designated muster stations and escape routes
- Duties during emergencies (Fire, Man Over Board, Flooding, Lifeboat launching, etc.)
- Routine duties
- Familiarization with safety signs
- Introduction to the company's safety policies

An onboard orientation:

- Introductions with the rest of the crew
- Briefing on the vessel's daily timetable (meals, cleaning hours, etc)
- Introducing to the new living quarters
- Familiarization with the vessel's communication systems
- Familiarization with the vessel itself while concurrently emphasizing on all the potential hazards (Accommodation, Deck, Bridge, Engine, etc.)

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S06 FAMILARISATION CHECKLIST

MV ""		
Call Sign	IMO Number	Date/Location

After arrival / embarkation of any new* person on board, it is the Master's and Duty Officers responsibility to ensure that the new person is immediately familiarised and briefed about the following:

1. Person's cabin, assigned life raft, location of life jacket and immersion suits, nearest fire extinguisher and other fire fighting equipment, escape routes, safety plan and any other vessel specific personal life saving appliances including training in the use of life saving and fire fighting appliances.
2. All on board safety information Symbols, Signs, Alarms, Signals
3. Personnel procedures for „Man Overboard"
4. Immediate actions when detecting fire or smoke, raising of alarms
5. Actions after hearing „Abandon Ship" or „General Alarm"
6. All locations of Master Stations, station bills and its content
7. Special duties assigned in case of boat and life raft launching (only marine crew)
8. Demonstration of vessel's internal communication system
9. Assignment of station during mooring and un-mooring (only marine crew)
10. Familiarisation tour through vessel (Deck, Engine, Accommodation)
11. Introduction of new employee to all crew members (only marine crew)
12. Instruction in the drug & alcohol policy
13. Location of company's Safety Manuals (Standing orders for all officers) (only marine crew)
14. Check of crew member's safety working clothes - by Master
15. Cabin control - all cabin items in good order
16. Instruction in the duties on board
17. Information about cleaning and meals
18. ISM Manuals, Standing Orders, use of Forms, safety duties (only marine crew)
19. Instructed about risks associated with entering enclosed spaces and applicable procedures on board
20. Complaint Procedure available and seafarer understand the rights (only marine crew)
21. Asbestos containing materials on board management and areas (if applicable)

Name of Person	Position on board	Date on board	Sign

I, _____ Master of _____ hereby confirm that persons listed above have been fully briefed and familiarised in all above issues and I will ensure that he will be further trained in accordance with company's Quality and Safety Management System.

Date Master / stamp

13.HEMPEL SHIPPING –Familiarization Checklist

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IV.5 Incident/Accident report

An incident/accident report is a form that documents all details linked to the occurrence of a specific unusual event. The form must be filled out as soon as possible after the incident in order to ensure that no vital information is overlooked. All Health and Safety agencies around the world agree that such reports are essential for understanding the root causes of unusual incidents and thus preventing their occurrence in the future. Furthermore, the report secures individuals from future liabilities that arise from the incidents. Proper analyzing of such reports can also raise safety awareness, safeguard the company from future costs and enhance the efficiency of safety policies and protocols.

When referring to incidents and accidents those include the following:

- Near misses
- Unsafe condition
- Injuries (minor or serious)
- Disabilities (permanent or temporary)
- Damage to property
- Fatalities

More particularly, a typical incident/accident report onboard a vessel can include but is not limited to:

- Vessel's information (Vessel's name, IMO number, Call sign)
- Place and date of occurrence
- A full report of the incident/accident that occurred
- Any corrective actions that have been taken
- Any actions that have been taken to prevent reoccurrence
- Signatures of the Master and DPA

HEMPEL SHIPPING

S02 ACCIDENT / INCIDENT REPORT

Definition:

An acident is undesirable or unfortunate happening that occurs unintentionally and usually results in harm, injury, damage, or loss; casualty;. Incidents can be classified as follows:

Accidental Bodily Injury (for further details see specified definitions by NOPSA in Form HS-18)

FT	Fatality
MI	Major Injury
LTI ≥3	Lost Time Injury ≥3; Resulting in 3 or more lost days
LTI <3	Lost Time Injury <3; Resulting in more than or equal to 1 lost day(s), but less than 3
MTI	Medical Treatment Injury
ADI	Alternative Duty Injury
NM	NEAR MISS is an unplanned event that did not result in injury, illness, or damage - but had the potential to do so. Only a fortunate break in the chain of events prevented an injury, fatality or damage.

Damage to Property

DAM:	Damage accident.
NON:	Non Conformity; no measurable outcome but under different circumstances a probable measurable outcome could occur.

MV ""		
Call Sign	IMO Number	Date

Name of Master:	Place:
If this ACC / INC –Report occurs from a Shipboard Management Meeting M02; or ISM – AUDIT; OR STOP CARD S 16:Fill in the date and subject:	Definition as per above:

Section A – Fact (report what did occur)

Designated Person informed and confirmed: Date:
Name and signature of Master:

Damage caused by third party?	Yes	No	If Yes issue Damage report D05
Shall be closed within 3 month if applicable			

Section B - Corrective Action:

Name and signature of Master:

Section C - Follow Up Verification (only by DP) Date:

- Corrective action has been completed with satisfactory result:

- Corrective action is incomplete and comments are as follows:

-Preventive Action to prevent reoccurrence has been applied with satisfactory result:

Name and signature of DP(or his Deputy):

CORRECTIVE ACTIONS in place and approved by Designated Person (or his Deputy)	Date:
PREVENTIVE ACTIONS approved by Designated Person(or his Deputy) CLOSED OUT	Date:

14.HEMPEL SHIPPING –Accident/ Incident Report

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CHAPTER V: PERSONAL PROTECTIVE EQUIPMENT

V.1 Introduction

According to the International Labor Organization (I.L.O.), Personal Protective Equipment (P.P.E) is deemed to be essential as a preventive measure against the occurrence of workplace accidents. It's required by Regulation 4.3-Health and Safety Protection and Accident Prevention- of the Maritime Labour Convention (MLC) that all states that have ratified the respective convention are obligated to provide a safe and hygienic working environment for the seafarers on board the ships that fly their flags. This includes the institutionalization of appropriate training and the provision of approved PPE. Seafarers are highly exposed to dangers that could affect their physical and mental health by the nature of their working conditions that are often proved to be unsafe in comparison to common shore occupations. Furthermore, the maritime organizations are to establish a workplace culture that is not exclusively promotive to the habitual practice of the PPE but also encourages the safe and correct usage of the said equipment. It is deemed necessary that the personal protective equipment that is used in the workplace is compatible with each other so as to remain effective against the hazards and the risks involved while meeting the ergonomic requirements. Lastly, the protection that the PPE provides in case of accidents is limited and does not eliminate any hazards, meaning that the personnel should not have their safety standards lowered while using them. It is required that the shipowning companies supply their ships with the appropriate and adequate Personal Protective Equipment (PPE) which is to be stored at all times in such a way so as it is conveniently accessible. Moreover, the gear is to be frequently maintained and inspected in order to be kept in fine condition. The protective equipment has to be correctly used by the crew members as per the manufacturer's instructions which should be kept in sight near their place of storage. Training must be scheduled regularly for the purpose of raising awareness for the subjected risks, the right usage and its correct maintenance. Generally, the ship owning company is responsible for providing suitable free of charge personal protective equipment to its employees, even though the workers can choose to supply themselves with their own PPE that is to meet the adequate standards outlined in the regulations.

15. Personal protective equipment

V.2 Personal Protective Equipment

The Personal Protective Equipment (PPE) that can be found onboard vessels, varies depending on the body part that it is intended to protect:

1.Head/Ear Protection:

- Hard Hat:

Purpose: The many kinds of hard hats are mostly used to protect the most essential body part, the head, from injuries or electric shock.

Design: They are predominantly constructed of high-density polyethylene, advanced engineering resins or fiberglass which is suitable for heat resistance. They are also fitted with straps to prevent slipping off their wearer's head.

Common Injuries: If not used the seafarer is accident-prone due to falling debris or random objects and chemical drips that can lead to fatalities. Furthermore, it can greatly reduce the risk of hair entanglement.

- Face Shield:

Purpose: Face shields are meant to protect the entirety of the face including the eyes, mouth and nose against projectiles, chemical splatter, infectious microorganisms. That is why they are used to prevent the spread of the Covid-19 pandemic. It is of importance that it be noted, that they are secondary protectors and should be worn with respiratory support and eye protection.

Design: The materials used for their construction are of high impact and heat resistance such as polycarbonate, polyester or plastic. They also provide optical clarity.

- Earplugs:

Purpose: Earplugs protect from low intensity of sound energy by muffling tones as they block sound waves.

Design: They are small in size and can be directly inserted into the ear canal. There are a lot of types of earplugs, the most common of which are foam and silicone ones. Foam earplugs are made of polyvinyl chloride (PVC) or polyurethane and silicone earplugs' material is usually soft and flexible rubber.

- Ear Defender:

Purpose: They are noise-cancelling headwear that protect from high intensity of sound energy in loud environments such as construction sites.

Design: They consist of hard cups with soft cushions that fit over the wearer's ears and their design reminds of normal headphones.

2. Eye Protection:

- Safety goggle:

Purpose: Safety goggles are a type of personal protective equipment used to protect the eyes from hazardous chemical splatter and harmful fumes or vapours. They are primary protectors since they offer significant protection as they can be sealed around the eye area and keep out objects, gases or liquids from entering the eyes.

Design: Their lenses are typically made of polycarbonate providing resistance to impact and clear eye view even under foggy environments while maintaining lightweight. Their frame is commonly made of sturdy plastic that is shatter-resistant and highly durable.

- Safety glasses:

Purpose: Safety glasses protect the eyes from dust, volatile particles and projectiles even though they have additional side shields they do not provide as much protection as goggles.

Design: The lenses of the safety glasses are made of various materials depending on the manufacturer such as plastic, polycarbonate or trivex.

- Gas welding goggles:

Purpose: This type of goggles provide high eye protection as they protect against heat and optical radiation created from welding although face protection may be required. Similarly, to arc welding helmets, they protect the eyes from UV (Ultraviolet rays) and IR (Infrared rays) light exposure preventing eye injuries.

Design: They are equipped with dark filters of various shades depending on the safety they provide and they form a protective seal around the eyes preventing sparks, volatile particles and projectiles from damaging the eyes.

- Arc Welding Helmet:

Purpose: The arc welding helmet protects the face, eyes and neck area of its user during the fabrication process in which they are exposed to electromagnetic radiation (UV-ultraviolet rays, IR- infrared light), sparks and heat.

Design: They are equipped with different shades of lens filters and can easily be adjusted to the head thanks to their ratchet-style head straps.

Common Injuries: This headgear is important as a measure to prevent photokeratitis, a painful eye condition also known as arc eye which is caused by exposure to artificial UV light. They are also meant to prevent blindness due to the inflammation of the retina. Moreover, it protects the user from flash burns and skin damage.

3. Respiratory Protection

- Dusk mask:

Purpose: This type of mask is used to prevent the inhalation of non-harmful volatile dust or sand particles. They can also filter allergens from entering the immune system.

Design: Dusk masks are most commonly made of paper (or fabric) with fitted elastic straps so they can be held in position.

- Half face mask:

Purpose: This mask protects mainly from cargo fumes or other harmful chemical fumes and dust particles. It is also equipped with disposable filter pads.

Design: Half face respirators are usually made of rubber, silicone and neoprene which are highly durable. For their manufacturing, silicone is preferred due to the flexibility and comfort it provides. Moreover, it is fitted with elastic straps and there are filters on both sides.

- Full face mask:

Purpose: They are air-purifying respirators that prevent the inhalation of chemicals, cargo fumes, gases and dust particles.

Design: This type of mask covers the whole facial area and is equipped with usually more than one filter/ cartridge. They are commonly made of hard plastic and lined with a soft silicone flange and they have fitted top and bottom straps.

- Surgical mask/ KN95/ N95:

Purpose: These types of masks are disposable and used to minimize the spread of respiratory droplets that are released when the wearer talks, sneezes or coughs and also protect the wearer from inhaling droplets released by others. Nowadays, they are used due to the Covid-19 pandemic so as to control its spread and reduce potential cases of illness.

Design: Surgical masks are made of a combination of layers of absorbent materials such as cotton and non-absorbent ones such as polyester blends and thus do not provide as much protection as KN95 and N95 masks. KN95 and N95 manufactured materials are usually synthetic like polypropylene plastic polymer and they can filter out and capture 95% of tiny particles in the air. Also, some N95 masks come with an

optional filtration valve made of electrostatic non-woven polypropylene fiber that provides more protection to the wearer.

4. Protective suits:

- PVC wetsuit:

Purpose: This type of suit protects from mild chemicals, oils, rain and saltwater.

Design: It is made of plastic polyvinyl chloride (PVC) as its name suggests. The PVC wetsuits are commonly of bright colours so as they can be highly visible for marine operations such as deck, cargo hold and tank activities.

- Boiler suit:

Purpose: Boiler suits are used to mainly protect the wearer from cuts, burns and entanglement in moving machinery but they can also provide relative protection from dirt, spills and grime. This clothing must be worn near heavy-duty machinery spaces to minimize the risk of burning and scalding.

Design: The majority of them are made of flame retardant and waterproof fabrics and they cover the whole body.

- Thermal suit:

Purpose: This type of suit aims to protect from weather conditions and specifically keep the wearer relatively warm by preventing hypothermia.

Design: It covers the whole body and it is manufactured from aluminized polyethylene and can be worn under a PVC wetsuit if the weather necessitates it.

- Apron:

Purpose: Aprons are a type of protective cloth that safeguards the wearer from potential burns generated by sparks.

Design: It covers the torso and thighs and is fitted with straps that can be tied around the neck and around the waist.

5. Hand protection:

- Rigger gloves:

Purpose: They are meant to protect from abrasion and grime and they are used for manually working heavy-duty machinery equipment, ropes and wires.

Design: They are reinforced with synthetic leather palms and nylon stitching.

- Impact gloves:

Purpose: This type of gloves are used in environments where there are high risks of impact hazards. They also tend to mitigate vibrations involved in heavy manual labour.

Design: They are made of durable and flexible materials such as thermoplastic rubber (TPR).

Common injuries: The continuation of exposure to intense vibrations can cause hand-arm vibration syndrome (HAVS) which triggers permanent numbness, muscle weakness or pain and in some cases the Raynaud's phenomenon - also known as "white finger"- that reduces the blood circulation and thus turns the fingers pale.

- Welding gauntlets:

Purpose: These gloves are made to protect from welding splatter, abrasion, cuts and high temperature. They are used for arc and gas welding workshops.

Design: They are typically made of a combination of leathers such as cowhide, deer hide, goatskin and pigskin.

- PVC Gloves:

Purpose: This type of gloves protect from a variety of oily chemicals, abrasion, cuts and punctures. They are mostly used for oily cargo operations and deck or engine duty.

Design: They are manufactured of polyvinyl chloride (PVC) and they are thin so as to provide fingertip sensitivity.

- Latex gloves:

Purpose: Latex gloves safeguard from abrasion, oil and a variety of chemicals. They are commonly used for chemical work such as chemical cargo handling operations and sandblasting. They are also used to protect from biohazards such as viruses and bacteria and thus reduce the risk of infections.

Design: These gloves are made of natural rubber.

- Thermal gloves:

Purpose: This type of gloves are designed to protect from cold or intense temperatures

Design: They are made of layers of heat resistant materials and materials that retain heat while removing moisture.

6. Protective shoes:

- Safety boots:

Purpose: Safety boots protect from severe impact and punctures. They also provide stability and thus safeguards from slips and falls.

Design: They are ankle lengthed and their typical design includes coverage of the feet' phalange bones made of steel. The soles are also constructed of steel plates and are oil resistant, increasing the wearer's stability.

- Safety shoes:

Purpose: They are a type of protective footwear and they protect from minor impact and light punctures.

Design: They do not cover the ankle and they can also sometimes be reinforced with steel, aluminum or plastic caps.

- Wellington boots:

Purpose: They offer protection from water, oils and other chemicals and they are recommended for wet environments.

Design: Wellington boots are typically made of waterproof materials such as polyvinyl chloride (PVC) or rubber and they are below knee-high length.

7. Miscellaneous:

- Barrier cream:

Purpose: Barrier cream is used for hand care to protect against contaminants, other irritant substances and occupational skin disorders such as dermatitis.

Design: It is a cream formula and the substances used vary based on the manufacturing company.

- Safety harness:

Purpose: It is a harness used for protecting the wearer's body from falls by evenly distributing the forces of gravity across the body.

Design: It is typically made of nylon and polyester and it is designed so that it provides comfort to movements.

- Personal gas monitor:

Purpose: Personal gas monitor is a device that collects samples from the air of the surrounding area providing warnings for oxygen depletion or the presence of toxic and flammable gases.

Design: They are portable monitoring devices with integrated software that alarms the user whenever the concentration of oxygen is dangerously low or when harmful gases are present.

V.3 Personal Protective Equipment and female seafarers

A matter of importance that should be addressed is the availability and suitability of personal protective equipment for female seafarers. It is a common fact that men and women differ significantly on body size and thus the men's sizes of P.P.E. can be extremely uncomfortable and unsafe for female seafarers. Nowadays, as more women join the maritime industry the situation demands more diversity in supplying various sizes of personal protective equipment. A survey conducted by ''CHIRP Maritime'' in 2019 proved that safety concerns on this issue have been ignored for a prolonged time and revealed that female seafarers have been struggling with not being provided with the correct or even a close to a suitable size. Safety concerns are of utmost significance for the maritime industry and not wearing any protective equipment due to unavailability can be proven vital. It is also important to be noted that wearing the wrong size can become a great hazard too as the stability or the optical quality of the wearer can be significantly obstructed. For instance, a woman using a hard hat designed for men is possible to have her vision reduced if the equipment constantly slips over her eyes. Another example regards the protection while working aloft. The improperly sized safety harness can hinder the movement of a female seafarer as a typical woman's body can be relatively smaller than a man's and thus suffer safety hazards.

CHAPTER VI: FATIGUE, ALCOHOL AND DRUGS

VI.1 Introduction

By definition, fatigue is characterized as a retardment in physical and mental health caused by the deprivation of energy and restricts one's capabilities. It can seriously affect reaction time, decision making, strength, eyesight and balance. Fatigue is also another contributory factor that can lead to occupational accidents. Many incident investigations that have been carried out in the shipping industry identified fatigue as the source of the accidents. A common feature found in many cases of accidents was seafarers suffering from fatigue while being on duty. It is a usually seen problem for the whole transportation industry and specifically for the maritime industry as its nature requires concentration, situational awareness and constant vigilance for long periods of time in combination with tiring workloads.

Fatigue regulations concerning the shipping industry can be found in IMO, MLC and ISM. In the IMO "Guidelines on fatigue" the potential consequences of fatigue are listed along with their symptoms. Consequently, the ISM establishes safety management requirements for the ship-owners such as manning ships with medically fit seafarers. Despite the existence of these primary conventions, codes such as the International Code of Safety for High Speed Craft also address and secure fatigue management. The MLC(2006) Reg. 2.3 has regulated a maximum of working hours and a minimum of resting hours in order to ensure the safe conduct of any operations onboard by securing the minimization of fatigue.

It appears that fatigue is an unquestionable maritime related hazard impairing seafarers' duty performance. In a study conducted by Gander and Le Quesne (2001, as cited in Gander, 2005) on New Zealand's coastal ferries' officers its was found that 61% of them felt usually affected by fatigue while on duty. Moreover, 26% of the officers reported recalling in the last 6 months an occupational accident resulted from fatigue. Besides the impairment of the performance, in the maritime industry fatigue also impacts the well-being of the seafarers by increasing mental and physical health problems that may lead to chronic illnesses and disabilities. That is due to the fact that 24/7 shift patterns on a vessel with severe noise and vibration cause great disturbances to crew members.

So what are the underlying reasons that result in seafarers' fatigue?
According to Ellis (2005) several seafarers and shipping companies in the UK, Singapore and Philippines reported some of the issues that they considered to be linked to fatigue, included:

- The extra load of paperwork
- Excessive drills and training
- Long and demanding working schedules
- False entries on working-hours documents
- Inadequate crew manning

VI.2 MLC A2.3 Regulation

The MLC regulation (2006) about working hours and hours of rest ensures that seafarers have a maximum of working hours and therefore a minimum of resting hours so as there is no impediment to maritime activities due to fatigue while maintaining the health of the workers. According to the Standard A2.3- Hours of Work and Hours of Rest the term “hours of work” refers to on-duty hours while “hours of rest” is the period off duty, excluding short breaks. The maritime companies ought to take into account the hazards that are accompanied by the fatigue of the seafarers that can potentially threaten the safety of their vessels. The shipping companies also need to inform their respective vessel masters about the conduct of drills and trainings so as not to disturb the rest periods of their crew.

More specifically, the A2.3 Regulation states that:

The limits of working hours are:

Maximum working hours should not exceed:

- Fourteen (14) hours daily
- Seventy- two (72) hours weekly

Minimum hours of rest shall not be below:

The minimum resting hours should not be less than:

- Ten (10) hours daily
- Seventy- seven (77) hours weekly

These hours of rest can be divided if necessary in two periods, the first of which should be at least six (6) hours long and the in-between period shall not be more than fourteen (14) hours in length.

The Regulation A2.3 also requires the posting of the vessels’ hourly working arrangement in an accessible place and should include :

- The maximum working hours or the minimum resting hours enforced by national laws and regulations
-
- The service schedule at sea and in port

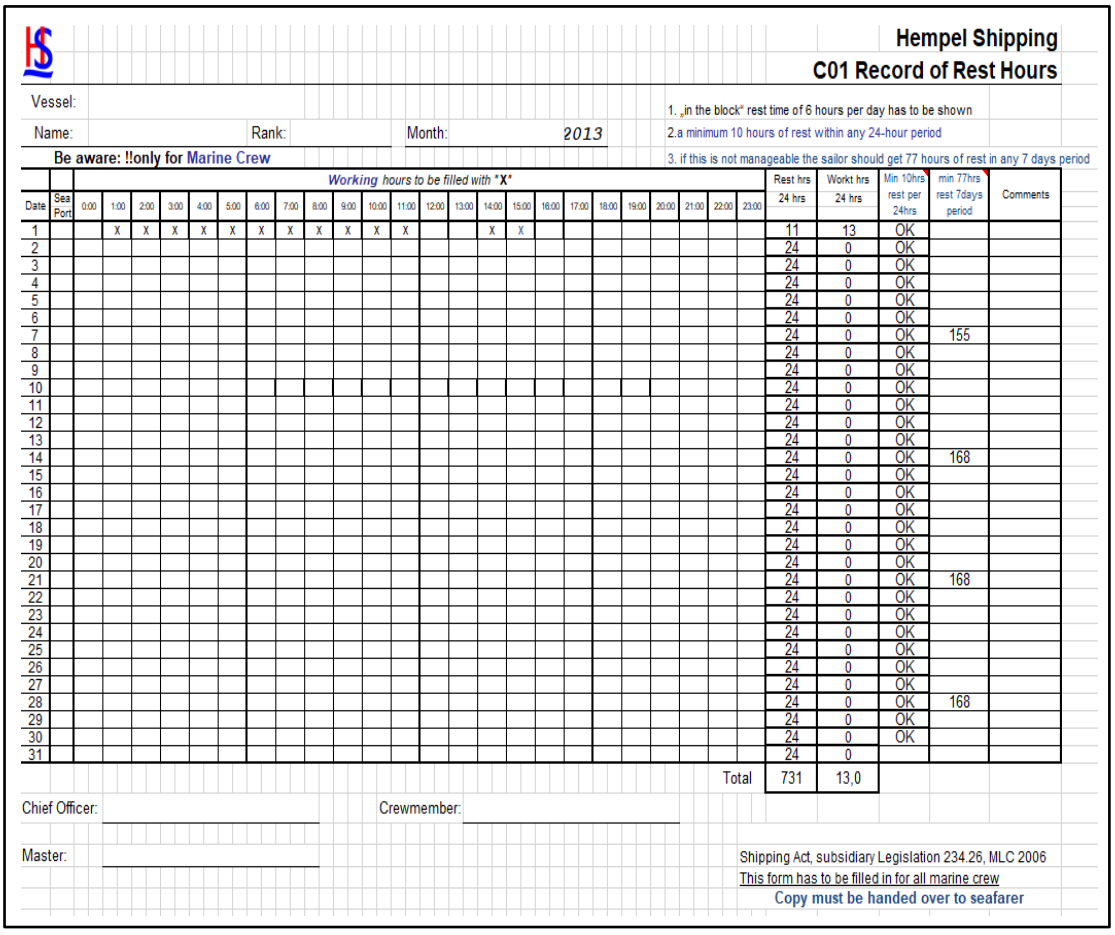
Lastly, it is important to be noted that the master has the absolute authority which is not to be restricted by this Standard. To clarify, in case of emergencies and safety reasons the master has the right to suspend the working or resting hours of their crew until the situation is resolved. After normality is restored the master shall ensure that the specific seafarers receive a sufficient period of resting.

VI.3 MLC-Young Seafarers

The MLC also provides a guideline (Guideline B2.3.1-Young Seafarers) regarding the working and resting hours of underage seafarers. To delve deeper the provisions applied to seafarers under the age of 18 are:

- The hours of work shall be no more than eight (8) hours daily and forty (40) weekly and overtime shall only be mandated if necessary.
- Adequate time shall be provided for meals. Specifically, for lunchtime, one hour should be secured.
- After the completion of two (2) hours of continuous work, a 15-minute break should be assured.

Similarly, to regulation A2.3, the master can exercise his overriding authority and request the young seafarer to be exempted from this guideline for emergency, training and safety reasons. These exceptional cases shall be recorded and signed by the master.



Hempel Shipping
C01 Record of Rest Hours

Vessel:
Name: Rank: Month: 2013
Be aware: !!only for Marine Crew

1. „in the block" rest time of 6 hours per day has to be shown
2.a minimum 10 hours of rest within any 24-hour period
3. if this is not manageable the sailor should get 77 hours of rest in any 7 days period

Working hours to be filled with "X"

Date	Sea Port	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Rest hrs 24 hrs	Workt hrs 24 hrs	Min 10hrs rest per 24hrs	min 77hrs rest 7days period	Comments
1			X	X	X	X	X	X	X	X	X	X	X			X	X									11	13	OK		
2																									24	0	OK		
3																									24	0	OK		
4																									24	0	OK		
5																									24	0	OK		
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25																									24	0	OK		
26																									24	0	OK		
27																									24	0	OK		
28																									24	0	OK	168	
29																									24	0	OK		
30																									24	0	OK		
31																									24	0			
																								Total	731	13,0			

Chief Officer: Crewmember:

Master:

Shipping Act, subsidiary Legislation 234.26, MLC 2006
This form has to be filled in for all marine crew
Copy must be handed over to seafarer

16. HEMPEL SHIPPING –Rest hours record
The above document is solely for academic display purposes and remains a property of HEMPEL SHIPPING

VI.4 Alcohol and drugs

Alcohol and drug abuse is quite a common practice misused by many people both on land and at sea with tremendous consequences for everyone's health and safety. Unfortunately, this issue is hard to confront because each government has distinct regulations against the abuse or even use of drugs and alcohol. In the maritime industry, seafarers have the ability to access an enormous variety of drugs and alcohol due to the nature of shipping. Of course, the extent of such access depends greatly on the ports of call. For example, a variety of drugs and alcoholic drinks is extremely accessible in ports of South America and West Africa, due to the establishment of different legislation background and their hard traceability. Moreover, while at sea, abuse of drugs and alcohol are twice as perilous in contradiction to similar misuse on land. The side effects of such abuse in combination with the unstable vessel's conditions create the ideal environment for occupational accidents. Studies show that seafarers are exceptionally susceptible to drug and alcohol abuse due to the mental health impact created by the hardships of the occupation and restricted social interactions. This form of escapism can lead to serious disturbances in both on-duty and off-duty hours and in the worst-case scenario occupational accidents as such misuse decreases critical thinking, reaction time and safety awareness. To prevent the risks of occupational accidents due to the consumption of alcohol and drugs it is of utmost importance that the pattern of this abuse is detected so the implications of the impairment they cause can be minimized. That is the reason for the creation of drug and alcohol policies which are based on the guidelines of the International Maritime Organization.

More specifically, the International Maritime Organization (IMO) states that:

- A medical testing system is to be established and regular examination are to take place
- Training is to be conducted and awareness is to be raised regarding the effects, symptoms and the consequences of alcohol and drug abuse
- Safety limits are to be established (maximum blood alcohol level, restrictions and prohibitions on drug abuse
- Lines of assistance and communication are to be established in order to aid diagnosed seafarers detox
- A non-discrimination climate must be adopted so that seafarers after their successful detoxification are not stigmatized throughout their career
- Create a friendly and helpful environment onboard vessels so as addicted seafarers can be encouraged to seek assistance

Moreover, masters onboard vessels are to ensure that:

- There is sufficient monitoring of the performance of the vessel's officers and seafarers
- The alcohol and drug abuse problem is identified and dealt with
- Disciplinary procedures and carried out if necessary
- Test procedures are being executed (Alcotests and drug-tests)
- There is familiarity with the policies and the procedures among the crew
- Sufficient feedback is provided regarding the programme
- Medical advice is obtained to deal with emergency medical situations
- Cooperation with port authorities is achieved by all means available
- Compliance with all national regulations concerning the misuse and abuse of harmful substances depending on the port of call

It's worth noting that Regulation VIII/1, Code A-VIII/1 and B-VIII/1 of the STCW Convention, as amended in June 2010 provides alcohol limits onboard vessels. More specifically, it demands a 0.05% for blood and 0.25 mg/l for breath detection limit. However, shipping companies are eligible to further stringent their drug and alcohol policies but are restricted from adopting policies that don't follow the minimum requirements set by IMO's regulations. Moreover, seafarers need to comprehend that abuse and misuse of such substances can greatly expose not only themselves but also their colleagues and the vessel's operations to hazardous situations. On account of that, seafarers must realize that any case of abuse of illegal substances will not be tolerated by both state authorities and shipping companies.

CHAPTER VII: COVID-19 IN THE MARITIME INDUSTRY

VII.1 COVID 19 AND PREVENTION

As mentioned in the first chapter, the occurrence of an illness from which the seafarer was not previously suffering from and even the aggravation of a pre-existing illness are considered as occupational accidents. That leads to the fact that illnesses are in fact an inseparable part of the occupational accident concept in the maritime industry. In recent years, a new pandemic is spreading fast all over the globe. Responsible for this pandemic is a virus named SARS-CoV-2. This virus is highly contagious and leads to a disease called COVID-19. The Covid-19 pandemic has impacted most aspects -if not all- of the everyday life. It is only logical that this virus has taken a toll on the maritime industry as well. Shipping services are considered of utmost importance especially at times like these where transportation is proven to be difficult due to the spread of the virus. A level of safety measures against the virus is implemented in the maritime industry that safeguards both ships' crews and terminals' personnel. It is essential that those who work in the field of the maritime industry are well protected against the virus so that sea transportation can continue operating undisrupted and therefore all the crucial supplies are delivered to their destinations. Unfortunately, due to travel restrictions, crews around the world will probably experience great delays at the periods of signing in and signing off. Moreover, vessels might be experiencing shortages concerning essential supplies and crew numbers and inspections may be postponed depending on the port states' regulations. These problems can potentially be a cause of occupational accidents as the vessel requires non-fatigued crew members, sufficient supplying and regular inspections. In order to fight the virus, firstly we need to understand how it works. Researchers have concluded that the SARS-CoV 2 spreads through volatile liquid particles coming through the mouth and nose of the infected persons especially when they cough or sneeze.

According to scientists, some preventive measures to minimize the spread of the SARS virus are :

- Keeping at least 6 feet (2 meters) distance from others
- Wearing the appropriate masks (surgical masks, KN95 and N95 masks or protective shields) and protective suits
- Frequently washing hands accompanied with regular use of antiseptic
- Getting vaccinated against the virus and its mutations
- Being informed about the disease, its consequences and the way it spreads
- Quarantine if tested positive

Crews onboard vessels need to prevent infections at all costs since medical support is limited depending on the location of the vessel. Shipping companies and seafarers need to adapt to the major delays as port authorities and facilities tend to operate with remotely or with emergency staff only due to the virus. Unfortunately, the future is uncertain but new research is being conducted and vaccines against the virus and its mutations have been developed and are still being researched upon to achieve the highest possible success rate.

17.The maritime industry during the COVID-19 pandemic

CHAPTER VIII: COMMON RISKY WORKS ONBOARD VESSELS

VIII.1 Hot works

The term “hot work’’ refers to any tasks that can potentially be a source of ignition. Hot works mostly involve - but are not limited to - tasks such as welding, grinding and brazing. Before performing such tasks a hot work permit and a linked risk assessment is required in order to implement all safety and health principles and thus minimize the risk of an accident occurring. Generally, the surrounding area of the worksite must be clear of any dangerous gases or flammable materials. Fire appliances have to be in good condition and easily accessible in case of fire. All personal protective equipment related to the task is required to be worn by the persons involved in hot works. If the hot work is taking place in confined spaces, sufficient ventilation must be assured. Lastly, a designated crew member has to be on standby as a fire watch in case of an emergency for the duration of the activity and for at least 2 hours after its completion. For carrying out safely hot works:

- Appropriate personal protective equipment is to be used and inspected prior to the work performance
- Screening must be used in order to protect the rest of the crew
- First aid equipment must be available and easily accessible near the worksite
- Appropriate firefighting equipment must be ready for use in case of emergency near the worksite
- Communication methods must be available at all times
- Adequate supervising is to be conducted
- Sings must be placed in clear view after the work completion that warn about the high temperature of the surface area

VIII.2 Working aloft-overside

Any work that is performed at a location where risk of falling is identified, is considered as work at height. That may include works at the accommodation, bridge wings, cargo holds, tanks, hatches, stairways and of course working overside. Prior to their performance, a permit to work and a linked risk assessment have to be issued. This means that all adequate control measures are implemented and the work is thoroughly examined and planned. Supervision is of vital importance and must not be disregarded. In any case, the person who will carry out the work has to be fully competent, trained and experienced. Any seafarer who is below the age of 18 or has less than 12 months of sea experience should not take part in such activities unless the work is considered as planned training and is accompanied by a competent person.

However, such tasks should only be performed if there are no alternative methods for their completion. For the safe performance of works at height:

- Appropriate personal protective equipment is to be used and inspected prior to the work performance. A safety harness must be worn at all times
- The work should be performed in broad daylight, but if it must be completed urgently at night, adequate illumination must be provided
- Tools must be minimized and a toolbox is required in order to provide freedom of movement to the person who is performing the work
- Communication methods must be available at all times
- If the work is being carried on top of the navigation bridge, any harmful equipment must be turned off (RADAR, Satellite antennas, transmitters, etc.) and a note or sign must be placed in the bridge mandating officers to not switch on the equipment until the completion of the respective work
- When working overside, additional personal protective equipment must be used including life jackets. The navigation officer must be notified and ready to activate the MOB alarm and the rescue boat should be ready for deployment
- Adequate supervising is to be conducted

VIII.3 Enclosed spaces

Any space that has limited entries and exits is considered an enclosed space or confined space. Such areas onboard vessels can contain toxic or flammable gases and vapours or even lack the sufficient oxygen levels. Enclosed spaces on vessels are considered -but not limited to- all cargo spaces, double bottoms, fuel tanks, ballast tanks, sewage tanks, pump rooms, chain lockers, voids, duct keels, cofferdams, engine crankcases, engine air receivers, CO2 rooms and battery lockers. All such areas must be considered as potentially harmful for any human activities. Even after testing the composition of the atmosphere in enclosed spaces, the danger may still be lurking. Just a single inhalation of toxic gases or air depleted in oxygen can lead to a loss of consciousness and subsequently death. Risk assessments and permits to work are essential to be issued prior to the work performance in such areas. If such works are not urgent, they should be avoided. For the safe conduct of works in enclosed spaces:

- Appropriate personal protective equipment is to be used and inspected prior to the work performance
- Communication methods must be available at all times
- A reporting system must be agreed
- Adequate supervising is to be conducted

- Sufficient illumination must be provided
- The space must be segregated from neighboring areas
- All pipelines' valves that serve the space must be secured in order to prevent accidental openings
- The space must be continuously ventilated before and after work performance
- Prior to entry , atmosphere tests must be conducted in order to determine the air's composition. Such tests must be frequently re-conducted during the work performance
- All necessary rescue, first aid and resuscitation equipment are available near the enclosed space's entrance
- In case of ventilation failure the space must be immediately evacuated

VIII.4 Mooring/unmooring and Anchoring operations

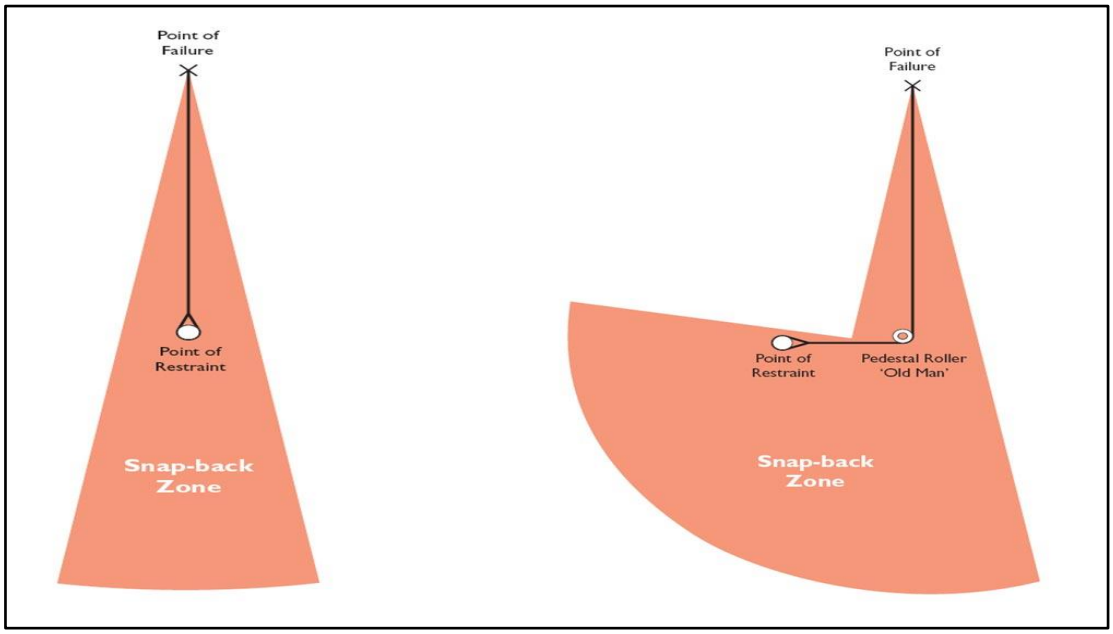
Those operations ensure that the vessel is either secured to a fixed position or let free to maneuver. Such operations require thorough prior planning and include multiple hazards and risks for the personnel involved. Chain/ line jumping, crushing injuries, risk of falling into the sea, eye injuries from rust, dirt and other volatile compounds and machinery failures are all possible scenarios that need to be assessed prior the operation performance. Moreover, such operations are conducted on the vessels' decks and thus exposing the crew to weather conditions. Risk assessments and permits to work are to be issued. Simple mistakes can gravely endanger individuals, the crew team and terminal workers. For carrying out safely such procedures:

- Appropriate personal protective equipment is to be used and inspected prior to the work performance
- Prior inspection and maintenance of the equipment must be conducted (Lines, anchors , hydraulic machineries, winches, etc.)
- Communication methods must be available at all times
- A reporting system must be agreed
- Adequate supervising is to be conducted
- Sufficient illumination must be provided in case the operation is conducted at night time
- All necessary rescue and first aid equipment must be available near the mooring and anchorage stations
- The crew is to be familiarized with the operations' procedures

- Anti-slip painting must be applied on the mooring and anchorage stations
- If excessive strain load is detected, it has to be immediately reported to the supervisor
- Teamwork must be established
- All mooring and anchorage stations must be free of any obstructions
- Lifebuoys must be ready for use
- The crew must be aware of the snap back zones

VII.4.1 SNAP BACK ZONE

A snap back zone refers to the space on the deck's mooring station that a mooring line can recoil in case of a failure under excessive tension. In case of a snap back , the line can travel with incredible velocity and has the potential to gravely injure anyone on its path. It is of vital importance, that such snap-back zones are properly marked on the mooring deck stations so as the working crew can avoid them. That includes markings near the drums, fairleads and rollers. However, the crew must always bear in mind that the markings could be inadequate mostly due to the fact that the true trajectory of a failed line is hard to be predicted and depends on various and complex factors (Line's composition and Breaking strength). This leads to the fact that the crew must never loose their sense of safety and always be vigilant. Moreover, it is also worth noting that the snap-back trajectory depends greatly on the line's point of failure. In general, the whole mooring deck station should be considered as a probable snap-back zone.



18.Snap-back recoil areas

RECOMMENDATIONS AND CONCLUSION

In my opinion, safety should be a number one priority for everyone involved in maritime ventures, from seafarers to companies and international organizations. Incidents and accidents should not be regarded as mere statistics. Behind them, human lives and properties are endangered. The maritime industry is considered to be one of the most dangerous occupation fields. Due to medical supplies and hospitalization being extremely limited onboard vessels, all necessary actions to prevent occupational accidents must be taken whatever the cost. Crew members should never be left alone while on duty at all times. Safety is in numbers. It is more reasonable to work in groups and pairs even for the most straightforward tasks rather than be isolated in case of need. Particularly, young and new seafarers need to be accompanied by experienced and competent colleagues. Statistics show that they are indeed the most vulnerable groups onboard commerce ships and have to be protected at all costs. Another important tool for the prevention of occupational accidents is communication. It is of utmost importance and can literally save lives. Proper means of communication have to exist and be available for every single crew member from the lowest ranking seafarer to the master. This way, it will be ensured that no crew member will ever be abandoned in emergency situations and times of need. Moreover, another life-saving tool against occupational accidents for seafarers onboard vessels is personal protective equipment. Unfortunately, proper training is not conducted for the right use of such equipment and seafarers disregard wearing even the most vital parts of the said equipment. Furthermore, seafarers need to comprehend that using personal protective equipment will not eliminate any hazards or risks. The equipment is solely a barrier between the user and the hazard and can only mitigate the consequences in case of an accident. However, this fact does not undermine the usefulness of the equipment. Personal protective equipment can be proved to be a borderline between death and life and should not be regarded as obstructions. Shipping companies and organizations have to be more stringent and unforgiving in cases that crew members are detected to either lack the proper means of communication or personal protective equipment. Moreover, particular attention must be paid to familiarization. Familiarization can greatly improve safety awareness, especially to newcomers if carried out correctly by the officer in charge. It should never be overlooked as another part of the overall paperwork or considered as something that the seafarer already knows. Masters and officers should firstly consider the safety of their crew above anything else. They have to thoroughly assess all possible scenarios. ISM-SMS documentation should also not be regarded as part of the overall paperwork. If studied and prepared correctly they have the potential to prevent accidents and save lives. They can be a wearing process and time-consuming but if it is for the sake of saving lives, so be it. If highly risky works onboard are not urgent, simply avoid them and wait for more favourable conditions to be met. Particular emphasis must be paid to alcohol and drugs. Addicted personnel are not only endangering themselves but also their fellow colleagues and the vessel itself. Cases of abuse or misuse of such harmful illegal substances have to be reported immediately to the master and the authorities in order to protect everyone, including the addict. Lines of communication and assistance must be open and available at all times for all seafarers so as to provide guidance against abuse of drugs and alcoholic drinks. Moreover, another significant issue is fatigue. It is expected that crew members that suffer from fatigue are greatly susceptible to accidents. Masters have to ensure that their vessels comply with all MLC regulations concerning working hours and rest hours so that their crews can

continue providing their services safely. Furthermore, near-misses must not be ignored. They have to be reported in order to be analyzed and prevent similar future occurrences. The fear of consequences that arise due to reporting incidents must be eradicated by adopting and promoting a non-punitive culture (no-blame culture) within the companies. Reporting incidents and accidents is a cost-free process of understanding new root causes and methods of preventing accidents. Occupational accidents affect both employees and employers and must not be overlooked. Organizations and committees around the world supply the maritime industry with great tools for preventing occupational accidents and have to be utilized to the fullest. In conclusion, by applying such principles, surely the working environment onboard vessels will be immensely improved. Occupational incidents and accidents will drop significantly and a reinvigorated and enhanced version of safety onboard vessels will emerge. Safety does indeed require resources and time but in the end, it can be proven to be beneficial for all parties involved. Safety is a reflection of quality and can ensure smooth conduct of all vessel's operations and contribute to profitability.

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