

## STUDY OF EFFECTIVE FACTORS INFLUENCING THE IMMUNE SYSTEM, ENHANCING MARINE TRANSPORTATION

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### Abstract

*Promotion of maritime safety and reducing the human and financial losses and damage to the marine environment in order to maintain the status of the ports in the country, reducing investment risk in maritime and shipping, marine economy and sustainable development, has special importance. It appears that due to the lack of a systematic approach to Safety repetition rate of accidents in this sector does not show significant decrease. This paper presents a systematic approach to Safety and tries to focus on the need for Safety applications in ports, by this, Safety system ultimate goal that is reduction in risk, danger and events in this section be achieved.*

### 1. Introduction

Shipping industry as one of the most important components of transport, due to environmental conditions of activity and being international always is faced with many risks.

Nowadays with the growing trend of global economy and therefore an increase in transportation of goods and raw materials through the sea, importance and attention to safety and security issues in vessel traffic has also changed radically. On the other hand, the connection between the ports and maritime transportation and other modes of transport such as road, rail and air transportation. Importance and attention to safety and security issues in vessel traffic has also changed radically. On the other hand, the connection between the ports and maritime transportation and other modes of transport such as road, rail and air Transportation also having a valuable human and physical capital as most sensitive points and even are considered as strategic points of countries.

Technology development caused Humans benefit from greater and faster service and at a lower cost. In line with this development, need to improve the Safety increased to higher level.

Therefore special attention to Safety is inevitable necessity and most basic tools for improving Safety is continuous assessment there are two conventional operational thinking in designing vessel traffic management system. First, the seafarers should have access to accurate information, timely and needed in order to have appropriate decision making.

Second mechanisms should be established for implementation and the expected results. It is clear that in all cases threatening the safety of a waterway, just cannot be fixed with vessel traffic management practices; for example, possible loss of steering or propulsion of ships cannot be resolved with vessel traffic management tools but in this case may also traffic management tools, reduce the negative aspects (Kiani Moghaddam, Talebnejad, 2012)

In the port, which Vessel Traffic Management has been implemented, administrators are selected and used existing tools until be able to perform effectively routine traffic activities and Safety

points in accordance with the specific characteristics of the port, therefore different characteristics of Ports

require effective traffic management measures that are specific for each port (Sollasi, 2005)

## 2. **Definition of Safety**

Ports have long been considered as one of the most dangerous places for job because of the variety in the tools and equipment used in ports, abundance of jobs and operating systems, the extent and variety of imported and exported goods is more distinct from other industrial sectors and have higher potential of accident. Safe Work in this environment of diversity requires a scientific attitude, conscious and active on mode of port and maritime services to internal and external customers. Use of the unaware of safe working practices, use of inappropriate equipment, worn and unsafe and unsafe procedures including cases that can itself or more factors together provide fertile field for disaster. They are events that occurrence of them not only cause are irreparable damages

in lives and treasure but also enter undeniable flaw to the validity of ports. Prevention of unsafe conditions and acts by employees is one of the main causes of occupational health and safety management in this regard, public inspection and specialized, using Czech lists, investigate the causes of accidents occurred are a few examples of the wide range of safety risk factors that have been identified. Provide instructions of safe work, develop and implement written plans defect inspection and repair of equipment and facilities, optimization procedures, continuous training of employees to learn how to work safely, monitoring plans to identify system weaknesses are including effective actions, that in Are active control and prevention of work-related accidents in port areas and about the personnel and equipment of the four main operations of the port (ship berthing, loading and unloading, transport and delivery of goods and receive operations) including cart, cranes, tractors, trucks, forklifts and Information Systems, electricity, water supply, repair shops, etc. that are used to support port operations applicable. Obviously, the effects of these measures can be incidence in the form of Increase safety factor of the port, reducing the rate of accidents increasing the efficiency of machines and equipment, increasing access to lower cost, reducing idle time of machines and equipment (Utilization factor) because of the need to repair or replace the unit, no need to recruit and train replacement staff, no need to provide medical care to accident victims, no need to buy parts, administrative costs do not need, insurance and legal the bulk of the time and energy to devote to their managers and executives (Hassan Mohammadi Zadeh, 2004)

## 3. **Identify strategies to improve the immune maritime traffic**

- Proper enforcement of existing laws
- Codification New Rules
- Improve communication
- Traffic Services
- VTS Vessel
- The required changes in waterway

According to the environmental factors studied and the impact of such weather conditions, entry of vessels with flags of different and management of marine transportation companies of varying

quality, the proposed solution has been selected by relevant experts in order to monitor and reducing potential losses (Kiani Moghaddam, Talebnejad, 2012)

#### **4. Different attitudes into immune issues**

With the study of the evolution of Safety in developing countries two different attitudes to Safety issues are encountered:

A - passive attitude

B - active attitude

#### **Passive attitude:**

In this view attitude of those involved in the immune system focus on safety after the incident was handled. This means that in this attitude deliberate planned action for prevention of accidents does not take place according to the current position of the organization and all efforts of individuals associated with immune issues respond to review the events. This kind of attitude is high in terms of cost and consequences of accidents cause lack in efficiency and effectiveness and cause organizational risks.

#### **Active approach to safety**

In fact, this view is the engineering attitude to safety that is another perspective view of the immune system. Much of this kind of thinking involved with the immune system's efforts focuses on preventing hazards, on the other hand, this approach immune issue is seen as a system. Systematic approach to the issue of Safety has a lot of benefits and during this process cause and effect relationships and interactions between system components is considered in terms of Safety. (Gol Mohammadi, 2004)

#### **5. Application concept of System Safety Engineering**

System consists of a variety of implementation which are formed a part or unit. Safety is also a description of the function of a component or components of a system under certain conditions in the way that create the lowest acceptable level of casualties. Terms of Engineering also includes result and function of maneuver or perform an action supported by expertise combined with following words: System safety engineering can be defined as follows: Skillful application and function of set of elements linked together to perform a task, produce a product, a service or a process to establish the lowest acceptable level of waste.

#### **6. Function of System Safety Engineering**

In the form of an immune system, assessment and Hazards Assessment & Analysis is considered as the core of a safety program. Safety process - Preliminary Hazards Assessment (PHA), that indeed a general assessment of the workplace Safety Hazards is considered, Sub Systems Hazards Assessments (SSHA) mentioned environment is an act by the immune system mechanism in the next stage will be discussed. Systems Hazards Assessments (SHA) (entire organization or workplace) is the actions that is undertaken at the end of the risk assessment. The result of above process is that environmental hazards in all components of the system and then impact of hazard each part on other sectors is assessed systematically. Finally, suitable measure to prevent and control intended environmental hazards is established and will be implemented

#### **7. Objectives of a safety program:**

There are many purposes for a safety program that some of them are:

1. Create a safe and disciplined environment in which all employees and contractors have no possibility of unauthorized exposure of hazardous conditions

2. Providing appropriate and effective and easy to perform a variety of missions work requirements, standards and guidelines for safety standards and regulations.
3. Gain an understanding of common sense coupled with consistent orientation for the establishment and maintenance of a safe working environment
4. Establishment of a competent authority in the interpretation of safety regulations in the workplace, state regulations and determine implementation of safety measures.
5. Comprehensive safety determining the policies for all units in the way that is inclusive of all requirements of the program.
6. Development of a safety plan with the Self-Assessment.
7. Evaluate the performance of duties towards each department's plans.
8. Creating a safer work environment with the lowest degree of risk in return for the establishment of environmental hazards
9. An effective and efficient and comprehensive safety training

**8- Outlines of a safety program:**

1. Existence of Safety Policy
2. Support and involvement in the effective management in safety program
3. Development of safe work procedures and provide appropriate equipment
4. The appropriate design and forecasting for all the components work
5. Preventive maintenance and effective about all the equipment of work and related supplies on order to prevent accidents and conditions that will increase the risk associated with work forces.
6. Effective and continuous safety engineering support in all matters relating to executive
7. Documenting all activities
8. Develop effective ways of testing equipment,, especially personal protective equipment
9. The most important design measures when emergencies happen
10. Written description of the responsibilities associated with maintaining a safe and secure working environment
11. Training and skills development, work safety and comply with all departments and operations
12. Constant Vigilance on proper implementation of program components (Moradi, 2008)

**9- The main elements of a comprehensive system of safety:**

With mention above introduction the need for suggesting a comprehensive system of safety that can have necessary comprehensive for deal with all the components of works is felt.

In this system, a comprehensive system that covers internal and external environment of the system in terms of safety is briefly introduced. In this approach, the five basic elements that could be the most important issue of each system in terms of Safety are introduced as follows:

- A. Elements of management and organization - Safety Administration
- B. the element of electrical, mechanical and personnel protection
- C. elements to prevent and protect against the risks of fire
- D. The element of engineering analysis of events
- E. Maintain a safe environment and sanitation work (Gol Mohammadi, 2004)

**10- Review and identification of hazardous areas and compliance with safety requirements:**

1 - Places of movement of goods –

These places, have been diagnosed as dangerous places in port accidents. 68 percent of port accidents is related to goods and its handling. These locations are: ships, port docks, areas near the ferry dock. Therefore detect and install adequate warning signs seems necessary.

2 - Input and output places

Given the safety issues at each port begins since the arrival of the ship or ... to port, hence give importance to the following will help to promote safety of Port:

Hydrography and Geography map of the area

- Find, maintain, and make sure to specify the paths for the input channels to the Port and Harbor and also the port areas and prevent them from interfering with simultaneous entry and exit.

- Printing, distribution and modification maps maritime and port areas comply with current rules and principles of international maritime area.

- publishing news and weather reports of the area about the future climate and necessary warnings to ships and port areas.

- Necessary and sufficient warning signs and sailors in port.

- Specify safe harbor and port to meet the needs of ships in normal and emergency situations and establish the necessary facilities in order to service properly by a set of ports.

3 - Training, personnel in skill and compliance with safety precautions. Although education issues have lower cost, compared with other factors but it seems that it has been less attention. Port staff at the beginning should be placed under special education and specialized and certificates after primary issuance and should be extended by the relevant organs after passing the courses safety repeatedly. Employees should know way of proper use of the port equipment and safety tips related to themselves and their colleagues

4 - Certification and activity permit for companies and workshops that is active in port areas

Such permits should be issued according to the type of work and the workplace and having trained and qualified personnel.

5 - Limiting undue and unnecessary movements of people, vehicles in port areas.

Movement of people should only be confined to the location of their activities and transport, rest and standing in unnecessary site should be avoided. Commuting routes of vehicles and railway be identified and be in the way that have less interference together, port transportation equipment should be under certain circumstances and time. Employees pass as possible be away from the operating area and, be under certain symbols and colors, passage of vehicles and manpower in one place at the same time be avoided

6 - Use appropriate clothes and tools for workers and staff in port areas

7 - Using the standard, suitable and safe operational equipment and vehicle in the workplace. Port facilities and equipment must be periodically tested and professionally reviewed and necessary documents about safety of such equipment and accessories and their drivers should be issued. Loading and unloading and handling of goods should be done by suitable safe and principal active equipment and accessories

8 - Creating a suitable culture among port workers and incentives for the timely reporting of incidents and social disaster and prediction of climate and safety at work determines the groups

and subgroups in control of events  
And developing strategies to prevent the occurrence and recurrence of similar incidents and the importance of the role of the Working Groups in enterprise structure and workshops subset of port. (KazemNia, 2008)

### **11- Conclusions and recommendations**

Briefly many factors play role in process safety in the marine transportation system for the overall safety of the transportation decision makers and planners should consider them that some cases which should be considered in recommendations are presented. For further study of each of the above factors, other researchers can estimate their effects on the immune process by conducting field study.

In order to optimize, continuity and safety at all levels of learning and preventing Break the immune system in the process of maritime transportation especially ports affairs, the following suggestions are offered in this part:

- Developing a comprehensive and proper system of education so that it covers all aspects of jobs that will be implemented by the port.
- Senior Managers set rules and regulations tailored to the needs of employees (human factors), So employees of the port, feel that senior managers understand their problems and supporting them in difficult situation.
- Developing a comprehensive human resources strategy in the way that this document considers all aspects of human including the following description:
  - Developing incentive system in such a way that resulting from combined or integration of motivational theory to sustain in motivation of individuals
  - Developing the process of recruiting, training, maintenance and development of human resources in ports,
  - Developing educational system so that it becomes a lifelong process of learning to teach.
  - The policy should make the learning process as a business and not a "random process" should be considered.
  - In development of strategic human resource attention must be paid regularly and consciously to processes that support individual learning as well organizational factors that is considered as a barrier to organizational learning
    - Duties and responsibilities should be done by identifying the exact work.
    - The amount and complexity of work tasks be considered challenging.
    - Developing systematic business and rest of staff port with finding shifts approach that have the least impact on employee performance.

### **12- Resources**

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