Effective Indices on Occupational Incidents in Persian Gulf Ports

Case Study: Bushehr Port

Abstract

The Persian Gulf Region has become a dynamic arena for many small and large ports to develop in recent years, due to its unique geographic and strategic location, and its diverse potentials in maritime, coastal and offshore sectors. Likewise, the influx and growth of various related industries has led to the increasing use of maritime transportation and employment of a large work force in the ports. The operational nature of port activities has placed them among the world's leading hazardous industries and working venues. However, implementing new technologies and following pertinent international standards both at sea and on land have not completely succeeded in guaranteeing safety and health at ports, which remains as one of the biggest challenges of people's working on berths, warehouses, storage yards, service zones, operational machinery, and other port activities. In an attempt to help resolve this issue that is of utmost importance not only for the humanitarian angle of the work, but also for the economic and management concerns of saving time and expenses that might be jeopardized by incidents in the working area for the personnel. This research aims at primarily identifying the relevant indices attributed to personnel safety and health, and then extracting the most effective (and less effective) ones through a combined approach including quantitative and qualitative methods. The 35 indices identified for the southern Iranian ports have been categorized into five groups (namely monitoring/control, education/regulations, management, environment/conditions, and human error), and their role in the incident records for a period of 6 years (2011-17) in the Iranian Bushehr Port has been calculated and statistically analyzed in the form of a case study. Results show that the direct supervision of the port senior management over safety issues through the HSE department, as well as the presence of professional HSE experts with sufficient familiarity and expertise on the related safety requirements and instructions for port operations are the indices with the highest impact on occupational incidents.

Introduction

The potential of job incident has been remained as one of the most important port challenges at jetties installations, warehouses, service zones and operative equipment. This research focuses on the effective indices on occupational incidents in ports for the first time in Iran.

Methodology

A “Mixed approach” with a conjunction of quantitative and qualitative methods is used. After field surveys, through "Focus Groups", by the “Content Analysis" and interview with port operators, the list of indices were defined and quantitative data extracted. Then, identified indices were prioritized to effective and less-effective ones through quantitative and statistics methods (figure 1); classification of qualitative factors is done by Friedman test. Also, Binomial T-test gets used to analyzing dependent and semi-dependent variables. The reliability of results was check through Cronbach's alpha test (figure 1).

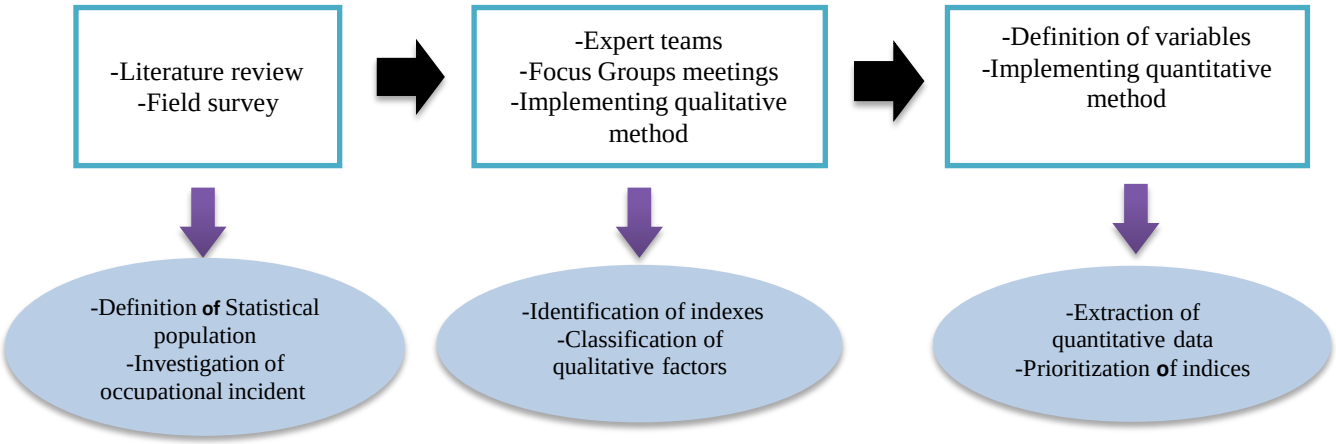

Figure1. Step of research

Results

First 35 related factors are identified and categorized into 5 general groups (5 qualitative factors), which ranked by Friedman test (Table1).

Table1. The classification and ranking of general groups

groups	Human error	Monitoring /control	Education / rules	Management	Environment/ conditions
rank	3.65	3.29	2.99	2.59	2.49

According to the "Binomial T-test" method, the results are analyzed (Figure 2) and effective indices are identified.

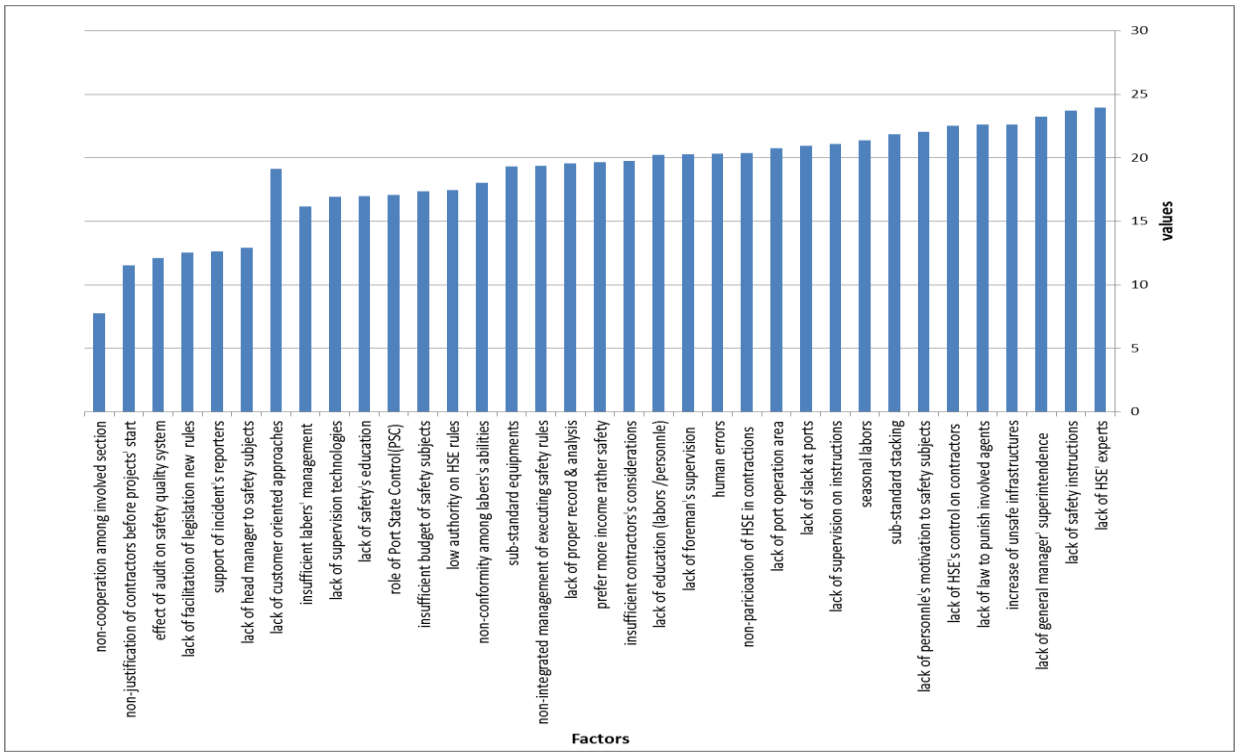

Figure 2. The comparison of effective indices

Discussion

The high potential of ports for occupational incident is not deniable for any manager. Extracted data and site surveys of Iran's ports especially at Persian Gulf region make this fact clear that many different factors have been affecting occupational incidents' rate. Prioritization of indices helps us to distinguish the effective form semi-effective ones. On the other hands, because of the some key items like "time" and "cost", selection of the most critical and effective indices is a challengeable issue. Suggested strategies to control and mitigate occupational incidents could be presented for ports with similar safety levels; quality of equipment's and feature of port area. The first key stone is employing of HSE experts who have sufficient knowledge and proficiency to comply with HSE requirements. Development of HSE department in different operational parts could control and mitigate the effectiveness of identified indices of annual incidents significantly. At the higher level of analysis (Based on table 1), human errors and monitoring /control, training and instructions, management and physical and environmental conditions (which are used as general groups), it is determined that the "human errors" with the average value of 3.65 has the highest impact on occupational incidents. Also, a comprehensive monitoring program by HSE experts has a strong effect to control and decrease such incidents. Regarding to the working conditions of Persian Gulf ports, high potential risks in different operational sections, obtained results have got necessary reliability (based on the reliability test). Hence, to starting a safety program to advance identified indices a technical/commercial programming should be done. For example; classifying the involved indices, allocation of safety fund to the most effective/destructive ones, using expert group in order to resolving basic mainsprings are the primary steps. Also, HSE experts have a deep effect on the effective indices. As a matter of fact, by advancement of safety's importance among port operators as the last involved and general managers as the first, the possibility of occupational incidents will show a drastic decrease in human errors.

Conclusion

Obtained results show that the role of HSE experts has a drastic effect on occupational port incidents. Safety instructions, as the second important index which is under the effect of first one, should be noticed too. Superintendence of head manager on HSE unit has a sharp effect on other factors too. Comparing the results with incident records and port conditions shows that the discussed indices in Persian Gulf ports could be used to enhance the level of safety in other ports of the country.