

## INVESTIGATION THE HEALTH, SAFETY, AND ENVIRONMENT TEACHING LEVEL IN OIL INDUSTRY EMPLOYEES AND ITS ROLE IN CRISIS MANAGEMENT

(Case Study: Cheshme Khosh Oil Company)

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**Abstract:** The experiences of horrible accidents in industrial complexes and oil industry show that most accidents have occurred because of lack of education and required knowledge of human force. Therefore, occurrence of many accidents and crises could be prevented through training or at least to lower the losses. In turn, this research is conducted by field method and the data collection tool is interview and questionnaire and subjects of this research include shift employees of Cheshme Khosh Oil Company. In this research, a questionnaire including 27 questions was distributed among 50 sample individuals. Hypothesis analysis of this research is performed using SPSS software and single sample t-test. Results of this research imply that research hypothesis which suggests that HSE trainings level and crisis managements is suitable in Oil Region of Cheshme Khosh is rejected by  $P=0.067$  and t-value of 1.875.

**Keywords:** Training, HSE level, Oil Industry, Crisis Management, Cheshme Khosh.

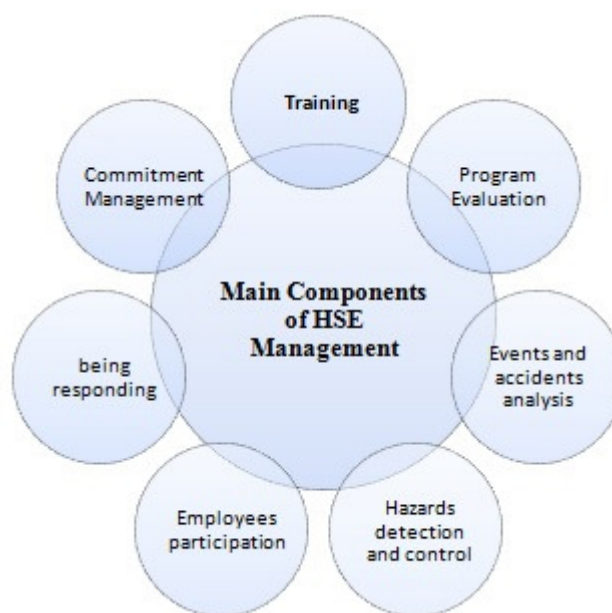
### Introduction

According to the statistics published from labor international organization 88% of accidents are because of insecure activities, 10% are because of insecure environments, and 2% of accidents are inevitable. Therefore, undoubtedly frequency of accidents is considered as a global challenge (Aghae, 2010) and every year high cost is consumed for events resulting from job accidents which could be said that most of them are because of weakness of required trainings which has caused many monetary and life-threatening losses. Training is one of the most important and basic tools for prevention of accidents and it is the first and foremost step in any job (Nabhani, 2008). Therefore, conducting HSE and crisis management trainings is considered as the main approaches is reducing accidents, injuries and monetary and life-threatening losses and increasing HSE culture.

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Training could be considered as a program that during its implementing individual could learn required knowledge and skills considering their tendencies and interests so they could play an effective and certain role in order to meet their goals and it increases the power of understanding, analysis, and recognition of people. Considering that the high percent of the accidents and mistakes occur due to the lack of required knowledge and lack of observing safety principles by employees and especially new employees, therefore with safety trainings we could increase the level of knowledge, skill and proficiency of employees in HSE affairs and therefore prevent the occurrence of many accidents (Nabhani 2008).



**Figure 1.** Main component of HSE Management (OR-OSHA100)

Figure 1 shows the seven main components of HSE management according to OSHA (2010). According to this figure, training is one of the most important elements in HSE management which is done considering the type of job, past trainings and employee's experience (OR-OSHA100). Training topic is very important because conducted studies and investigations in recent years show this fact that generally accidents due to the work do not have a single cause and they occur of technical and human causes. These causes depend on the type of job, environment, work conditions, tools and also the awareness of employees with respect to the work hazards and the level of safety culture of employees in an industrial complex (Osooli, 2010).

Therefore, considering the above-mentioned, the most important goals of this research include: increasing the individuals' awareness level in field of HSE importance and crises management in Oil Industry (cost of accidents, safety advantages and observance of safety

principle), enhancing the individuals' awareness level about preventing the accidents in oil industry and operational region of Cheshme Khosh, increasing the individuals' skill in using safety systems in different industry tiers and recognizing the employees' tasks and responsibilities in reacting to emergency situations.

In this research, besides surveying HSE trainings and crises management in employees of Cheshme Khosh Oil Operational Region, we also mention the required trainings for employees and the role of these trainings in crises management.

### **Literature Review:**

It is quoted that every five years human knowledge doubles and this increase changes everything. So why not make familiar the human resource of an organization with this evolution? Studies show that the employees' training helps in maintaining, continuance and conservation of an organization. A three-year study in Singapore has shown that 17% of commercial and industrial companies of this country faced bankruptcy, while this ratio about companies which have conducted training programs is less than 1% (Moradi, 2011). In sum, usual American companies spend more than 1500 dollars annually in training each employee which these figure show the importance and value of training in the industry (ed.gov-Technology, 1999).

Training is one of the best ways to promote the profitableness index in human societies. Era of management and training high speed communication has made us to a "global village" and in this complicated world the number of opportunities, environmental threats in time unit are increased. One of the most important factors which causes loss is lack of enough information about natural and manmade disasters and also the lack of paying any attention to importance and the role of people in supplying safety, hygiene, and rescue in case of disasters (Hashemi Asl, 2011).

Safety training is a wide effort in order to make individuals familiar with the type of work, required knowledge, and individual skills for accident-free and safe work. In other words, safety training must inform about three ground of personnel's type of job, personnel's science and knowledge, and personnel's skill level in the work (Nabhani, 2008).

In comprehensive model of evaluating and promoting health and safety of job environment (healthy job model), promoting health and safety of job environment is a state in which employees and employers know, want, and can work health and safely. In this model, the knowledge of training and promoting health, job, safety and management is used (Motalebi Ghayen, 2010).

Causes of accidents include: causes due to the lack of individual tools, personal causes such as lack of suitable training, mechanical causes such as lack of machineries. Extensiveness of nature of HSE training should be somehow that be sufficient in reaching company policy and its goals and in the same time be in accord with the discipline and law (Habibi, 2005).

In the system of quality management ISO 9001:2008 part 2-2-6, system of environmental management ISO 14001:2004 part 2-4-4 the topic of training and awareness in ground of quality and environmental problems (Jalali, 2011). Also in the system of safety management and professional hygiene OHSAS 18001:2007 part 2-4-4 the topic of training and awareness in ground of safety and hygiene is emphasized (Taghizadeh, 2010).

Job safety and hygiene training is an influencing factor in preventing and reducing accidents and diseases due to the work in productive units. On the other hand, other methods have different effects in adopting it (Jalali, 2002). Creating HSE instructions and crisis management must be parallel with hazards due to past instructions and new trainings. In these trainings it must pay heed to intuitions, attitudes and beliefs (Toosi, 2012). Therefore, considering the positive effect of training intervention and the role of time in decreasing the effect of training on safety behavior of employees it is suggested that training programs along with later surveillance of managers be hold in regular times (Tajoor, 2011). Trainings reinforces learning spirit and learning organization in evaluating and reviewing their activities in HSE management system get the most benefit from past experiences and events (Roohi, 2011).

One of the most important and basic components which is suggested in implementing continuance improvement plan is employees' and user training who are engaged in the industry. Meanwhile, determining training content, training style, identifying workers exposed to hazard, and implementing training programs is one of the main challenges confronted to safety managers in the industries. What is necessary is presence of a practical guidance in order to help the officials in implementing training programs (Ghosi, 2009).

The most important implementable activities in training include: creating training system, evaluation of training needs, training planning, determining and supplying training facilities, providing training to the employees, effectiveness evaluation, encouraging for self-learning and reviewing, training evolution and continuance (Nasr Azadani, 2009).

Reaching complete safety in different industrial activities and tendency to grown safety culture requires performing essential activities in all grounds which one of the most important is creating required conditions in order to promote knowledge level, attitude and skills of

personnel in job environments. The role of effective training as a progress and evolution axis in different grounds in relation to decreasing the accidents is very important and evaluating the needs, planning, implementation and evaluating the effectiveness of personnel training periods in decreasing the accidents is two-fold important because in one hand, it enhances the level of skill, knowledge and intuition of safety criteria in performing the activities and on the other hand, it reinforces the spirit and self-confidence of personnel. Effective training could have a significant role in relation to determining training needs of safety, optimum training methods and effectiveness evaluation and also in reinforcing safety culture and finally in reducing accidents and controlling the loss (Haji Hosseini, 2010).

In early moments of hazard, awareness and adequate intuition of hazard, the most basic work is gaining required skills in order to be prepared and confront with accidents and disasters and using it for your own and others safety (Aghamiri, 2007). Technological transfer to third-world countries could cause many hazards if safety would not be internal or employees and communities do not receive training. Learning provides the required training and skill for safe work by employees in their jobs. Awareness of adequate work and performing it correctly requires training and practice (Halvani, 2009).

Emergency management competency requires sufficient knowledge, skill and resources, motivation and attitude in different levels which includes training, special training, guidance, laws, and policies for supporting and responding to the operations (Sharma, et al, 2009). Therefore, training the employees' tasks is one of the most important primary principles in emergency management (Faulkner, 2012). And training needs must be performed before the training and then the required planning should be done (Rideley, 2008).

In oil industries, high budget is spent for training but the main reason of its low effectiveness is that training levels are not performed adequately and in sequence. Training levels in HSE and crisis management include: awareness, education, training, practice, and test. The first three elements are primary and the other two are secondary (Givehchi, 2012). Effective elements in training program include: job analysis, training procurement, training implementation, and valuation (surveillance and evaluating training periods) (Nabhani, 2008).

One of the evidences shows that supervisors and unit heads are required to implement the content of HSE management guidance with aim of reducing hazard due to work, providing required condition for HSE training for employees (NIOC Safety Laws and Regulations, 2011).

Considering the dynamic characteristic of job hazards and risks, on-duty training for enhancing preparedness and responding to the emergency situations is highly important and its implementation requires planning and precise study of training needs. Training is considered as the most efficient tool and most powerful process of knowledge and skill transfer to human work force of oil engineering and Development Company (Ahmadi Tavana, 2012).

Training, informing, and instilling culture have important role in implementing HSE management system (Kashkouli, 2010). Also it could be a strategic key in order to conserve and deepen the organization existence in crisis situations and to improve the organization treatment in competitive conditions (Dabiri, 2012).

### **Research Methodology:**

This research is descriptive-analytic and current research type is practical and the study population could be analyzed by survey. Current research by investigating and studying different resources about this topic performs the problem statement in next section. Then, it evaluates the crises management and HSE trainings in shift-work employees of Cheshme Khosh Oil Company and the role of these trainings in crisis control in this company.

### **Case Study:**

Cheshme Khosh Company is located in 52 km away from Dehloran town of Ilam suburbs. Weather of this region is warm and arid. This region is of Operation Regions of West Oil and Gas Company of subset of Iran Central Oil Company which with nominal capacity of 155 thousand barrels per day separates the productive oil of Cheshme Khosh, Paidar, west Paidar and Dalpari oil fields and transfers it by a 18" pipe with 153 km length to the No. 3 operational unit in Ahvaz and Shahid Chamran Pump-house. The transferring oil of Cheshme Khosh is to supply the feed of refineries or export through oil terminal to the Khark Island (WPOGC database, Central Oil Company, 2012).

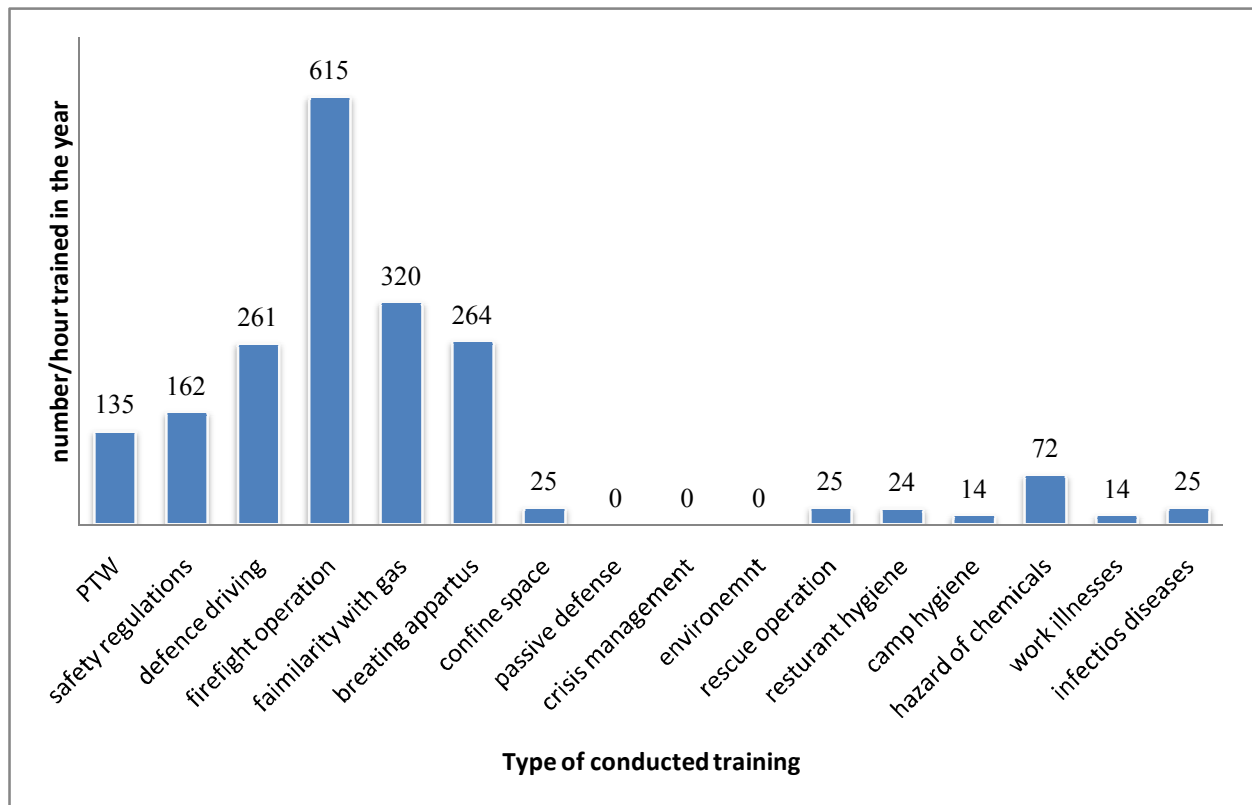
Statistic population of this research includes all contractual and official shift-work employees of operational unit and desalination of Cheshme Khosh Company which considering the oral interviews with employees and according to the consulting with experts 150 individuals were selected. Research time period is April 2012 to April 2013.

Considering the nature of this research, statistic population includes individual who have B.A Degree or employees with lower degrees with more than 5 years experience. Sample number was 49.11 based on Cochran formula; therefore 50 individuals were selected for more accuracy of competent individuals.

Data collection method in this research includes library method in order to collect related information with theoretical basics and research experiences, creating hypothesis model and also questionnaire for examining research hypothesis so that a questionnaire including 27 questions was designed which included a 26 closed question and 1 open question and it was distributed to statistical society.

In this research five-score Likert scale was used to answer the questions. For final evaluation of the research 32 questionnaires were distributed to the statistical population which using SPSS software, Cronbach alpha of durability was calculated. Cronbach alpha coefficient is 0/95 which is a high coefficient so we can say that the achieved results of questionnaire have high stability.

All number of employees in the region 464 individuals had official contract and 564 employees were contractual who wore for one week and rest for another week. Diagram 1 shows the conducted trainings and number/hour trained individuals in Cheshme Khosh Company in year 2012 (Documents of Cheshme Khosh Company, 2012).



**Diagram 1.** Conducted trainings, number/hour trained in the region in 2012

**Table 1.** Number/hour trained, number of maneuvers, number of firefighting practices, number of meetings

number	Title	Row
2177	Number/hour trained in the year	1
10	Hold maneuvers	2
81	Firefighting practices	3
1	Meetings with HSE topic	4

Considering the diagram 1 and table 1 the annual capital of training in this company is 2.11 which is a low number for an industrial unit and training in fields of crises management and passive defense were not conducted. So, considering the provided statistic it is inferred that employees do not have any enthusiasm to attend HSE training classes; therefore, employees must be encouraged to attend these classes.

**Data analysis:**

In current research descriptive statistic, frequency tables for analyzing sociology data of statistic population and one sample t-test foe used for hypothesis evaluation. Also, the open question of the questionnaire for defining codes #1 and #2 was analyzed.

**Research findings:**

Evaluations showed that all respondents are male and the most frequency is related to organizational post of operation unit with 36 percent frequency and work experience with 3-5 years had 40 percent frequency and in relation to education level, B.A degree had 70 percent frequency.

After analyzing data resulting from questionnaire by SPSS software, following results were obtained:

**Table 2.** One-Sample Statistics

SD Error	SD	Mean	N	
0/107	0/763	3/20	50	Employees training

**Table 3.** one sample t-test

95% Confidence interval		Test Value= 3		Df	T	Training level
Upper	Lower	Mean difference	Sig. (2-tailed)			
.4192	-.0145	.20231	.067	49	1.875	



According to the table 3 which is obtained by t-test, there is not a meaningful statistic relationship between questions of this hypothesis ( $P=0/067$ ), therefore, it is more than meaningfulness level and  $t=1.87$  and the response average to this hypothesis is 3.20 therefore with 95% possibility, the main hypotheses based on sufficient trainings in field of HSE and crisis management is rejected. This result is inferred that level of HSE trainings and crisis management in the Company is not sufficient and suitable. Also, results from open question imply that 48 percent of respondents have expressed code #1 that is HSE trainings and 52 percent have expressed code #2 which is crises management, training for emergency situations and performing maneuver; so that employees require training such as: crisis management training, reaction in emergency situation, performing maneuver, rescue, firefighting, individual protection, environmental evaluation, and fighting with Salk.

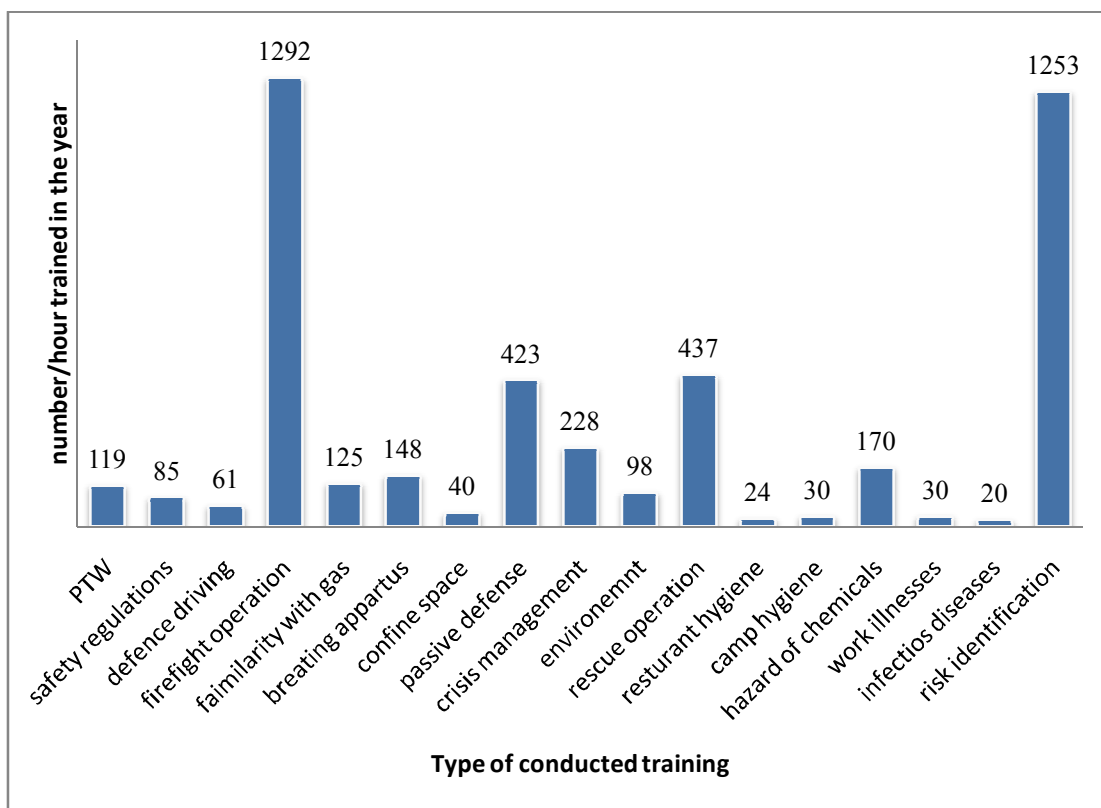
### **Discussion and Guidance:**

Considering that according to the hypothesis test, HSE trainings and crisis management for the employees of Cheshme Khosh Company is not suitable so that after creating HSE training system and crisis management, the education needs must be identified and a precise planning would be implemented and then required facilities for their trainings must be determined by employees and finally required trainings would be provided. For fulfilling trainings, their effectiveness must be evaluated so that training levels (awareness, education, training, practice, and test) must be correctly conducted. In this level, personnel must be encouraged for self-instruction and HSE training and crisis management and their regulations and in this way the mind would be strengthened and the trainings must match the career of the individuals. Also, consultation with psychologists could be touched on so that better result would be obtained from trainings.

In lights of educational needs in time of crisis at least paying attention to trainings such as emergency evacuation training, trainings related to identifying emergency alarms, training related to the way of informing the accidents by personnel, trends of shutting down the unit, the potentials of emergency situation is necessary. These trainings must be provided in time of initializing the organization for new employees in time of using new devices, new materials or in time of adding new process to the system, in time of change of trends, and in times when the indicators show the needs of training. After completing planning and providing required trainings, HSE department must hold emergency maneuvers with different scenarios and then evaluate the performance of all units. So that in next meetings of the

maneuvers, results and problems of each one of these groups are studied and required suggestions would be provided.

Considering the provided suggestions and also the Tool Box Meeting, personnel training with respect to reaction in emergency situation and familiarity of personnel with emergency gathering places, identifying and analyzing hazardous conditions and factors, better reaction to crisis in operational region, trainings about reporting the conditions and unsafe works by employees to the heads or the HSE department, training in time of technological evolutions, change of administrative methods, environmental changes, new material in 2013, is significantly increased and annual capital is 4.46. Diagram 2 shows this graphically.



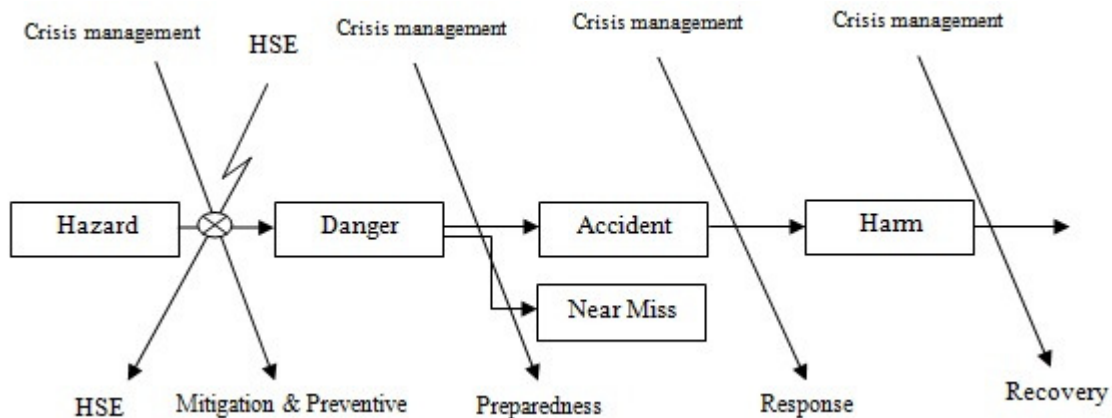
**Diagram 2.** Conducted trainings, number/hour trained in Cheshme Khosh Compani during 2013 (Documents of Cheshme Khosh Company, 2013)

Table 4 shows that number/hour trained, number of maneuvers, number of firefighting practices, and number of meetings with HSE topic in Cheshme Khosh Company during 2013. As it is seen, statistic of 2013 is significantly increased with respect to 2012 and personnel have more inclination to participate in training classes because of encouragements and training diversity and most individuals have had the required preparedness in lights of reporting unsafe situations in order to prevent the accidents and confront with emergency situations (Documents of Cheshme Khosh Company, 2013).

**Table 4.** Number/hour trained, number of maneuvers, number of firefighting practices, meetings with HSE topic

Number	Topic	Row
4592	Number/hour trained in year	1
12	Conducted maneuvers	2
93	Firefighting practices	3
5	Meetings with HSE topic	4

Considering the definitions and concepts of terms risking, hazard, semi-accident, accident, injury, crisis management and also steps of creating injury, accidents and steps of crisis management, HSE role in controlling the accidents and crisis management could be depicted as figure 2.

**Figure 2.** Overlapping point of Crisis Management, HSE

Considering the Figure 2, overlapping point of crisis management and HSE is in Preventing Phase. Therefore, the role of training in crisis management and HSE could be found such that in case of conducting required trainings in this phase the existing hazard, semi-accidents, and accidents would decrease and finally the possibility of accidents, injuries, losses and crisis would be so low.

## Conclusion

The base of sustainable development is human resources development, and the base of human resources development is; awareness, education, training, practice, and test.

Therefore, if all individuals from designers to manufacturers, engineers and managements, employers, and all employees and everyone who engaged in this company receive required

trainings in field of HSE and crisis management and take safety as their priority, then the number of accidents will fall but this is only possible when company senior management provide required resources for HSE training and crisis management to the personnel and protect them so that the possibility accidents and conditions and factors creating crisis in the company would reduce and the cost due to the accidents and crisis management would be significantly decrease.

### References

- [1] Ahmadi Tavana, B., Hosseini, A. Hosseini Jenab, V. (2012). Emergency preparedness and response analysis of the effect of education in promoting knowledge and skills of employees' petroleum engineering and development Company. Second National Conference on disaster management. Page1.
- [2] Aghaee, A. (2010). "Review of workplace health and safety." Printing. Shiraz. Press N Shiraz. Page 12.
- [3] Aghamiri, S.; Saghafinya, M. (2007). "Public education events, prevention, response and first aid." Printing. Tehran. Hellgate Press. Page 1.
- [4] Central Oil Co website <http://www.icofc.ir/>.
- [5] Dabiri, A. (2012). Human resource management in crisis situations. Conference on Human Resources Management Pathology. Page6.
- [6] Document of Cheshmeh Khosh Oil Operation (2012)
- [7] Faulkner, A. (2012). "HSE Rules and Guidance Handbook". Arrow Energy CEO, No 44.
- [8] Ghosi, R.; Khwaja Afzali, M. Ebrahimi, B.(2006). Safety in industrial practical model of effective teaching. Journal of Engineering Education 31 Ss 95-111 Ayranshmarh.
- [9] Givehchi, S. (2012). "Basics of crisis management handbook." Science and Research Branch, Islamic Azad University of sistan and Baluchestan, Zahedan. Page 31.
- [10] Habibi, E. (2005). "Applicable safety and performance standards in the industry." Printing. Tehran. Press Fanavaran. Ss2-3-22.
- [11] Haji Hosseini, A. (2010). Promotion of the role of the Occupational Health and Safety construction industry. The first national conference on safety in the construction industry. Page 1.
- [12] Halvani, G.H (2009). "Safety and Health for Engineers." Second edition. Tehran. Subhan publications. Ss244-232.

- [13] Hashemi, Asl ; Taghipur, faith, faith, faith (2011). The role of management in planning and providing appropriate educational messages to promote the community to reduce losses caused by disasters. *Journal of Educational Development*. Page 10.
- [14] ICOFC portal, <http://www.icofc.ir/>.
- [15] Jalali, A. (2011). "Integrated Management System (IMS)». Sixth edition. Tehran. Press D.A.S - Iran. Pp 13-17.
- [16] Jalali, J; Rzaly, Muhammad Baqir al (2002). Comparative study of the effects of occupational health and safety training on an ongoing and dynamic methods to improve the level of knowledge and attitude of Mines East of city workers. Page 1.
- [17] Kashkouli, M. (2010). Fifth Seminar of Heads of HSE (Health, Safety and Environment). *Torches. Khorasan*. No. 542. Page 6.
- [18] Moradi, M.B (2011). "The standard of ISO10015». South Pars Gas Complex Company. Page 15.
- [19] Motalebi Ghayen, M, Ghazi, O. (2010). "Guide to Safe Work 1, a comprehensive model for assessing and improving workplace health and safety (safe working model). Second edition. Tehran. Pick publications. Page11.
- [20] Nabhani, N. (2008). "Technical safety and protection." Fifth Edition. Tehran. Publications Remembrance Asadi. Pp 216-206.
- [21] Nasr Azadani, M., Rezaei, Fereydoun; Kalati Masumi, A. et al (2009). "Guide to Health, Safety and Environment (HSE) in construction projects." Printing. Tehran. Press the Warriors. Page 53.
- [22] Rideley, J (2008). "Health and safety in Brief", ELSEVIER, Fourth Edition, No 60.
- [23] Roohi, Pe, Roohi, Pa. (2011) Architecture and engineering principles HSE culture and its role in reducing incidents of large companies. Page 1.
- [24] OSHA (2010), "Safety and Health Management-the Basics- (OR-OSHA 100)", No 2, 2-4-37.
- [25] Osooli, A.R (2010). "Introduction Manual overview of the HSE». Printing. Asalooye. South Pars Gas Complex Company. Ss2-17-35.
- [26] Safety Guideline in NIOC. (2011). the management of health, safety, the environment, civil defense and disaster management national oil company. Vol: 1 Tehran. Page3.
- [27] Sharma.V et al (2009), "Capacity Building, Training and Education for Disaster Management". No 1-2.

- [28] Taghizadeh, A.; Farjaminya, B.; Kohanzadeh, F. (2010). "Intergrated Management System (IMS)". Second Edition. Tehran. Publications BCI. Page 140.
- [29] Tajvr, H; Ghanbar race, Amin et al (2011). Effect of safety education on improving worker safety behaviors. Journal of Information Sciences. Letters to the Editor.
- [30] Toosi, M. (2012). "Teach defensive driving techniques". HSE training staff for ICOFC personnel, Mahmoud Abad.
- [31] Welcome Documents Springs Area Oil Operations (2012 and 2013).
- [32] WOGPC Portal, <http://www.wogpc.ir/>.
- [33] WWW.ed.gov/Technology/(1999), No 29.