

Synoptic Analysis of Hail Hazard in Bojnourd City, Iran

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Abstract

Hail is one of the most important atmospheric phenomenon, which occurred during Spring and Fall seasons due to atmospheric instability caused by cumulonimbus clouds and severe thunder storms. The most damages in agricultural sector is due to hail, which caused lost in horticultural and agronomy productions each year. In order to investigate synoptic mechanism on hail occurrence conditions, a cluster analysis was performed according to Bojnourd weather station data. To perform classification and subsequent calculations, the sea level pressure (SLP) and the geopotential height of 500 hPa for 26 days were extracted in the Grad's software. Regarding the mechanism and performance of atmospheric systems in creating hail phenomena in the area, four patterns were identified in the formation of the hail, including: 1) low pressure in the Caspian Sea; 2) low pressure in Pakistan and high pressure in Azores; 3) high pressure Caspian Sea and low pressure in Saudi Arabia; and 4) high pressure in north of the Caspian Sea and Low Pressure of Pakistan. The results showed that the months of April and May had the most hail cases during the studied period. Overall, formation of low and high pressure systems in north and south of the region and enforcement of meridional flows cause a moisture advection from the Gulf of Oman and Caspian Sea in geopotential heights of 850 and 700 hPa. In addition, falling cold air from upper latitudes and lifting of warm air cause a gradient temperature on the area and hence occurrence of hail phenomenon. The region experience more hail phenomenon when low pressure in Pakistan and high pressure in Azores were dominant on the area.

Keywords: Hail, Atmospheric Pattern, Cluster Analysis, Moisture Flux Convergence.

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Hazards Identification and Analysis of the Rural Settlements of Aladagh Rural District in Bojnourd Township

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Extended abstract

This research was carried out in Aladagh rural district of Bojnourd township with 801 KM² area and more than 35 villages, that have been tried be studied its villages environmental and geomorphological problems. in order to understand the rural hazards, important and relevant characteristics contains population, topography, hydrography, geology, climatology and geomorphology are separately investigated. Then, information is set up in maps and tables. The results show that environmental studies and geomorphology are required in rural planning. Natural and geomorphologic hazards on rural settlements in the region have been investigated in terms of the energy flow in both inland and outland groups. The studied area in terms of risk factors for internal processes including earthquakes is a part of a high-risk area. Exogenous hazardous processes including the occurrence of landslides, fallings, floods and drought effects of the environment.

After getting acquainted with the demographic characteristics, it was found that, unlike many points, the second and third densely populated villages are the highest villages between villages of rural district, which on the other hand, this characteristic reflects the role of morphogenic processes in creating the proper platform for the development of villages and on the other hand their risk indicator. The villages of the region are located in two zones consisting of mountainous and plain lands. In the mountain part, on one hand the high slope has been acting as a limiting factor for the rural zone and on the other hand, it has played a role in the formation of slope processes like landslide and rock falls. In addition to raising the groundwater level, low slope in the downstream part between the mountain plain, and flooding the rivers leading to special damage to farms and buildings when falling down. Firouzeh and Bazkhaneh rivers are the main arteries of the region, which the life of a large number of villages in this rural district, depends on their flow in the countryside of them. the presence of active faults and lithology conditions makes the earthquake occurrence of high intensity and high risk. Near 21 villages are located adjacent to the fault line. Most important slope movements in this region include

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landslide and rockfall. The establishment of the Reain, Arkan, Taraghie kord and Darsoufian villages on the basis of pebble sandstone with clay, marly and evaporative sediments in the upper part, has activated landslide outer process. On the other hand, the effects of positive tectonics in the mountainous region and the presence of calcareous and dolomitic height maker formations has activated the process of rockfall in the Paghaleh, Kaykay, Taraghie kord, Darsoufian, Rakhtian and Arkan villages. The proximity of the villages with main and subsidiary waterways and their connection point and also the steep slopes overlooking them, has exposed the flood phenomenon as a risk factor for the population of about 17 villages in the southern, central and northern parts of the region. In the southern part of the rural district, newly built residential units, agricultural lands and roads of Dartoum, Gerivan, Rakhtian and Hesare hosseinie, in central part Khoshmanzar, Mataranlou, down Mehnan, Gharehbashlou, Marz, Kalatehnaghie and Taraghie kord villages and in the southern part Sandalabad, Hamzanlou, Allahverdikhan, Khodagholie, Malkesh and Borj villages are influenced by sudden floods. Drought is one of the damaging problems of the villages in recent years. The annual rainfall data of the synoptic meteorological station of Bojnourd in the period of 30 years leading to to 2017 indicates a gradual decrease in rainfall. In particular, precipitation has dropped dramatically from the long-term average of 30 years (247.2 mm) from 2010 to 2017, and the average of these 8 years has reached 205.5 mm. This process has led to the formation of semi-arid conditions in the area of a large number of rural settlements in this region.

Based on this research, the primary nucleus and central space of most villages have a suitable location for environmental hazards and most of the dangers are on non-standard constructional outside the villages, farms and agricultural lands, which requires more attention from the residents, and Bonyade Maskan, Jehade Keshavarzie and Abe Mantaghehie experts. Therefore, considering the appropriate environmental conditions of the region and the role of villages in the production, with a little investment in the biological and welfare aspects of these villages, in particular the Tarhe hadie, hydrologic structures and their roads, their biological attractions will increase and we will see the optimal use of the natural resources of this region.

Keywords: Natural hazards, Hazard Analysis, Rural Settlements, Aladagh rural district, Bojnourd.

Designing Organizational Factors Affecting Knowledge Transfer Model Aimed at Reducing Environmental Hazards in Iranian Oil and Gas Projects

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Abstract

Despite the potential threats to the environment, the oil industry plays a positive role in society. Knowledge transfer not only plays a significant role in knowledge process, but also helps the oil and gas industry to reduce their environmental impact with improvement in their operational efficiency. Sharing of knowledge, information, and practices across cultural and national boundaries has become a means to address critical global problems. This paper explores oil and gas industry projects and identifies the critical organizational factors that affect knowledge transfer and influence their performance. The paper concludes with a conceptual model that accounts for the relationships among these factors that can guide further research in understanding knowledge and information transfer across national and cultural boundaries.

Introduction

The oil industry holds a major potential of hazards for the environment, and may impact it at different levels. Despite its potential threats to the environment, the oil industry plays a positive role in society as well. It is still necessary to find ways to conciliate industry development, especially active organizations in this industry, with environmental protection. Organizations have the most essential effects in forming and directing the behavior of their staffs. Advances in modern societies have led to more consideration of knowledge management by organizations. Knowledge transfer plays a significant role in knowledge process. Besides, it helps the oil and gas industries to improve their operational efficiency and so reduce their environmental impact. There are various effective factors in knowledge transfer. These factors are generally related to individuals, organizations, and technology. Based on previous studies (Mei et al., 2007; Hassandoust et al., 2001; Wickramasinghe & Widyaratne, 2012), the effective factors can be divided into two main categories named content and context.

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Though in the literature that are many studies which have been focused on the different factors affecting knowledge transfer, limited studies have examined the organizational factors, and there are still many challenges to understanding the essential organizational factors which affect the knowledge transfer procedure in an industrial organization, company or group. This paper focuses on this type of factors, which affects knowledge transfer, from both theoretical and empirical viewpoints. We provide an integrative conceptual framework for organizing the literature on effective organizational factors for knowledge transfer. Most top ten effective factors are identified from the questionnaires filled out by 137 experts from Iranian oil and gas companies. The obtained results reveal that organizational culture, organizational relationships and reward system have the most significant influence on the knowledge transfer. Besides, we provided effective solutions for the organizations to improve their knowledge transfer process. Our findings can help practitioners develop a more focused approach in dealing with the most significant factors.

Materials and methods

Regarding the lack of theoretical point of views, complete and better frameworks is essential to summery and conduct all organizational factors which are most effective in a knowledge transfer process. In this research, it would be realized by answering the following research question.

Research Question: What are the most important organizational factors in knowledge transfer within projects?

The paper develops a conceptual framework for the analysis of knowledge flow transfers in projects. Based on this theoretical framework, the paper proposes research hypotheses and builds a causal model that links the constructs of the model. The organizational factors regarding knowledge transfer in general are summed up from literature and then the issue is studied by conducting a survey in companies. Participants of the study included well-known and successful oil and gas companies. Using in-depth data from Iranian oil and Gas Company, we study the role of organizational factors in knowledge transfer.

Discussion and Results

Based on a systematic investigation of effective factors in knowledge transfer currently available in the literature, a common frame of reference for knowledge transfer development is developed. This frame of reference consists of thirteen organizational factors. Besides, it will provide a good departure point for future work in knowledge transfer, both academically and practically. These factor including organizational structures, reward system, leadership characteristic, organizational culture, organization commitment, motivation, management support, strategy, organization relationship, training, opportunities to share, control mechanism and team orientation. These factors have investigated in oil

and gas projects and it has been identified that 11 items of mentioned factors are effective on transferring knowledge and there is a direct relationship between them. Organizations should attempt to maximize the effect of these factors in order to increase knowledge transfer rate.

Organizational culture has been identified as the most important factor in knowledge transfer. All organizations have personalities as people do and characteristics such as flexibility, innovation, and more. In order to more success, an organization should implement the knowledge orientation culture, such that providing knowledge becomes institutionalized. The second identified priority is the organizational relationship. In order to succeed in knowledge transferring, organizations should create this motivation in their employees. Cash, non-cash, and organizational position lead to better performance of employees in knowledge transfer. Organizations can achieve the best response from their employees by proper defining their reward system. Among the factors studied, it was found that training and team orientations would not have a significant effect on the knowledge transfer in the projects. In addition, despite the positive effects of team works, this factor will not be lonely a motivator for more knowledge transfer. Organizations, with Strengthening and planning on effective organizational factors in knowledge transfer, can prepare the workplace so that knowledge transfer and sharing can be greatly increased.

Conclusion

Organizations have essential effects in forming and directing the behavior of their staffs. Today, most behaviors of the staffs have an organizational origin. This paper aims to identify the most effective organizational factors in knowledge transfer process in order to reduce environmental hazards in oil and gas projects. we developed a conceptual model and hypotheses to verify the role of organizational factors in knowledge transfer. The results reveal that organizational culture, organizational relationships, and reward system have the most significant influence on the knowledge transfer.

Keywords: knowledge transfer, environmental hazards, knowledge, organizational factors, projects.

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Geomorphologic Heritage Assessment of Khorramabad City for Urban Geotourism Development and Conservation against Human Hazards

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Abstract

In recent years, the ideas of urban geomorphologic heritage and urban geotourism have become very important among scientists and specialists. While, the human hazards affecting the natural environment of cities have damaged, destroyed, and threatened urban geomorphological heritage. Therefore, the assessment of the urban geomorphological heritage and suggestion a conservation program is a basic necessity for development stable urban geotourism and is the main goal of this research. This study was conducted as a case in Khorramabad city. This research has been conducted with an innovative and integrated approach by combining fieldwork, quantitative assessment of geomorphological heritage, and investigation of damage and destruction factors and, finally offered a conservation program for the first time. Research data are mainly provided through fieldwork, image resources and subjective maps. The tools used include subjective maps, field tools and ARC GIS 10.6 software. For data analysis, the Pica et al. (2017) model has been used to geomorphosites assessment and fieldwork done to check human hazards affecting them and presented a conservation program. The results showed that among 33 geomorphosites, Falakolflak hill with 25, Makhmalkuh with 24 and Shabikhun cluse with 22 score, gained the highest scores for the development of urban geotourism. Among the threatening hazards of geomorphological heritage, the maximum amount respectively was related to the road construction, the construction in the foothills and the release of garbage and wastes in the geomorphosite core zone. Therefore, in the present research, a conservation framework has been developed in five sections: creation organizational support, assessment, hazard identification, conservation measurements and monitoring

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for conservation of geomorphological heritage and consequently stable development of Khorramabad urban geotourism.

Introduction

Geomorphological heritage are not limited to natural areas, rural and open spaces, but very valuable examples of it can be found in urban spaces. Urban geomorphological heritage can be defined simply as a geologically attractive location, and in particular geomorphological within a city. In recent years, the ideas of urban geological heritage, urban geomorphological heritage, and urban geotourism have been great importance among scientists and specialists. While, numerous human hazards, destroying and threatening, the city's geomorphological heritage, which are the main sources of geotourism development. Therefore, the offer a conservation program for urban geomorphological heritage is a fundamental necessity for the development of sustainable urban geotourism. The main objective of this research is Inventory and evaluate the geomorphological heritage of the core zone of Khorramabad and its buffer zone in order to introduce to tourists and to develop urban geotourism and offer a conservation program as a fundamental necessity for the development of sustainable urban geotourism.

Materials and methods

To achieve research purposes of this research, data such as geomorphological maps, geology and etc. have been used. To do this research, First Geomorphosites of core zone the city and buffer zone it's through fieldwork has been inventoried, then, based on the model of Pica et al. (2017), the geomorphosites have been evaluated. In the next step, using field studies and surveys, have been identified threatening human Hazards each geomorphosite. Finally, based on the results of evaluation the geomorphosites and the check of human hazards affecting them, has been proposed the conservation program of in danger geomorphosites to develop sustainable Geotourism.

Discus and Results

According to the field studies conducted in the area for the inventorying of geomorphosites, samples and various types of geomorphological heritage are inventoried. In assessing the geomorphological heritage, the Falakolaflak hills, has gained the top scores among the geomorphosites evaluated in terms of urban geotourism. What that has caused more damage to Khorramabad city's geomorphosites included road construction, construction (as a result of physical development of the city), and the spill garbage. Therefore, based on the results obtained and field studies, has been offer a conservation program for the urban geomorphosites of Khorramabad. This protection plan has been written in five

sections: organizational support, evaluation, understanding the hazards, protective actions and monitoring.

Conclusion

According to the results of the research, the core zone and the buffer zone of Khorramabad city, has a lot of diversity of landforms, which has given the view and special beauty to this city. Part of this urban geomorphological heritage is anthropogenic or man-made phenomenon; but the problem that exists it is that these interventions and anthropogenic influences, if it is too much, become a completely negative and hazardous factor for the destruction of geomorphosites. Existing destructive effects show that is needed protective actions and after that to actions monitoring and continuous monitoring and the current protection rules to the extent that it seems are not protecting works and natural heritage. Therefore, serious action is needed in this regard.

Keywords: Urban Geomorphologic Heritage, Urban Geotourism, Human Hazards, Conservation, Khorramabad.

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**The Physical and Social Resilience Framework of the City
Districts against the Earthquake
(Case Study: Keshavars District in Region 6 of Tehran City)**

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Abstract

Despite several decades of valuable research by researchers in the field of disaster resilience, there are still many uncertainties about this issue. Perhaps the only thing that exists in this regard between consensus researchers is that the resilience is a complex, multifaceted, and multiple dimensional concept. This issue also has more uncertainties in the resilience of the city districts, especially in social and physical aspects. However, improving the resilience of urban neighborhoods against a disaster such as an earthquake is important and can be exploited using the capacities and potentials available at these levels to reduce the possible consequences of the earthquake and return time to the previous and even better than before accelerated.

Accordingly, the purpose of this paper is to "develop a resilience framework to promote earthquake risk management at the neighborhood with an emphasis on physical and social dimensions." Also, identification of factors and indicators that affect earthquake and capacity building for earthquake risk management with a community-based approach in the framework developed to improve the resilience is another aspect of this study.

In order to create a framework for physical and social resilience of the neighborhood against earthquakes, first specialized texts and global experiences have been studied, and based on this, key components and indicators of physical and social resilience of the neighborhood have been deduced. To determine the sub-indices, the four-dimensional framework of Bruneau was selected as the basis for this field of study. After deducing the indicators, the AHP (Analytic Hierarchy Process) method was used to achieve their weight and prioritize them. Subsequently, by selecting a neighboring unit from Keshavarz district in region 6 of Tehran, observations were done and descriptive and analytical maps were

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prepared in CAD and GIS softwares. Then by SWOT technique, strengths, weaknesses, opportunities and threats were identified. The SWOT table was analyzed with respect to the weight of the indicators and a final strategy was proposed to enhance the resilience of the case study.

This article concludes that the 4 criteria of Bruneau (4R), including "Robustness", "Resourcefulness", "Redundancy" and "Rapidly", in promoting earthquake resilience, despite providing a good foundation, in the "neighborhood scale" are not complete and comprehensive. In addition to the 4R, in order to achieve a resilient neighborhood, there are other criteria such as "flexibility", "compatibility", "diversity", "centralization", "density", "enclosure", "legibility", "regularity", "balance", "collaboration", and "cohesion" are also considered.

Keywords: framework, physical resilience, social resilience, neighborhood unit, district, earthquake.

Geographical Survey of Chlorine Gas Leakage at the Chlorination Station of Abfa Company Using Aloha Software (Case Study: Lar Station)

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Abstract

Chlorine is a toxic gas and oxidant that is used in Iran to treat drinking water. Failure to investigate the effects of gas leakage or reservoir explosion can cause irreparable damage to employees and residents around the station. So far, no research has been done on this issue in Lar. The present study studies the release of chlorine gas from a one-ton reservoir at Lar chlorine station. In this paper, using Aloha software, we examine the nature, extent, rate of propagation, and various risk areas and vulnerable populations. Investigations show that the gas release in the event of damage to a one-inch valve can result in a deadly radius of 1.5 kilometers, effective 5 kilometers' radius and Can be felt up to 10 kilometers. It was also found that in the warm season in the first minute about 400 kg, and in the cold season 330 kg of gas can be removed from a hole in the diameter of one inch. Due to the possibility of occurrence of the incident and the location of the station in the direction of the prevailing wind, there is the possibility of harming a large number of citizens located at a radius of 5 kilometers from the station. Therefore, taking effective steps, such as: informing the residents, increasing awareness of the staff and the relief forces, installing proper scrubbers and increasing the level of safety of the station are necessary.

Introduction

A chemical leak is a serious threat to the air quality and occupational safety of residents near its leakage site. Despite the large efforts of factories and industries to manage chemicals safely, there is always the possibility of devastating and fatal accidents. In many cases incidents are not understood, predicted or avoided. Getting ready to respond to these crises at the time and place of occurrence requires the identification and assessment of high-risk

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locations. The incidence of accidents in densely populated areas has a wider impact on society. The extent of the damage caused by these incidents depends on the extent of expansion, the first reaction to the incident, the incident and the surrounding area. An appropriate response to these conditions requires an appropriate coordination between individuals and local institutions. This occurs when the level of awareness in society increases the risk and the need for mutual preparedness to deal with it.

In our country, despite the importance of the hazards of exposure to chemicals, are generally programmed to respond to emergencies, taking into account the nature of the various materials and their respective risks, the level of risk and their range of exposure in a manner that is as effective as possible in the shortest time possible, There is not.

One of the most potentially damaging materials that is widely used today in the industry is chlorine gas. A large number of major industrial incidents in the last century have been related to the release of this toxic gas in the environment. Chlorine is used in the manufacture of plastic materials or other materials for the treatment of water and sewage, as well as the manufacture of refrigerants, glues, insecticides, drugs, disinfectants, bleachers and other consumer products. One of the sources of chlorine emissions from a water treatment plant in Iran is August 14, 2017 in Dezful, which left one dead and 509 injured, so it is best if possible to replace the chlorination system with a purification system with Ozone is a more modern, safe and effective way.

Ozone is one of the compounds that, according to its specific properties, has been used by European countries for nearly a century as a disinfection in drinking water. The first application of ozone was made in 1893 in the Netherlands and was fed to a refinery that fed the Rhine River. Today, more than 1,000 water treatment station use ozone as part of a chemical treatment, most of which are in the western countries, especially France, Switzerland and Canada. The largest ozone depletion facility has been used in the regions of Paris and Montreal.

Software modeling is a quick and accurate way to predict the extent of material release and simulate its consequences. Because the available mathematical models for sequencing modeling involve complex and time-consuming computations, the use of simulation software at this stage is important and because the evaluation of the consequences of hazards such as the release of high-risk chemicals in the environment, one of the most important and essential steps to increase the level of safety in existing or developing units is the importance of using more software with more capabilities. The purpose of the assessment is to determine the extent of the potential hazards and incidents of fire, explosion and distribution of toxic substances.

After modeling the probable events that can occur in a process, it is time to assess the effects and consequences of the incidents, which can be classified into

the two categories of consequences of the toxicity of released materials in the environment and the consequences of the explosion of abandoned materials in the environment. One of the information's necessary to assess the outcome of process events is vulnerability criteria, which, after using the scenario modeling stage, to analyze the extent of possible damage, should compare each outcome with standards that indicate the degree of damage.

Due to the location of the Clare gas reservoir near the town of Lar and its location in the direction of the dominant winds of the region, as well as its location located at an altitude higher than the city, it is necessary to consider the possibility of leaking this gas heavily Poisonous and hazardous, for this purpose, the purposes of this study is to investigate the possible scenarios of chlorine gas release at the Abfa chlorine station. One of the scenarios with a high probability of occurrence is the possibility of failure and leakage of gas from the outlet tubes, which is one inch in diameter. This study examines the occurrence of this happening in the summer.

Materials and Methods

In order to investigate the risk of chlorine emissions and to calculate the release method, the amount of dispersion and radius of damage, it is necessary to collect data including the physical and chemical properties of chlorine gas, the climate of the region, storage location and use of gas, storage tank type, shape, size and reservoir capacity. At first, the weather information of the area was extracted from the Meteorological Organization's Statistical Yearbook. Then, by referring to the station, information about the location of the reservoir and its type were collected.

Since the existing mathematical models for outcome modeling include complex calculations and very timely, the use of simulation software at this stage is important. In order to model the distribution, propagation speed, dispersion rate, and the radius of modeling impact by software, a quick and accurate method for Anticipating the extent of its material release and simulating its consequences has been exploited by ALOHA software, one of the free software for air pollutant release. The software is provided by the US Environmental Protection Agency (EPA) to model incidents caused by the release of toxic, explosive, or explosive fire or explosive substances. The software has a very rich database (more than 1,000 chemical materials) and a simple environment to prevent user mistakes.

Discus and Results

As mentioned earlier, the most important criterion in the rate of diffusion and diffusion of gas is wind speed and air temperature. Therefore, considering the climatic conditions of the area, the calculations were carried out in two seasons (warm and cold). According to the climatic averages table for the warm season,

the average temperature is 34.4 ° C. Relative humidity is 35%, wind speed is 16 m/s and the wind direction for the western wind and for the cold season average temperature is 11.8 ° C, relative humidity 60% Wind speed is 9 m/s and the direction of the wind blowing is considered. Also, the cloud cover is 5% and the fracture in the tank's outlet valve, which has a diameter of one inch. According to the calculations made in the software, It was also found that more reservoir storage is evacuated in less than 5 minutes in almost all cold and hot seasons. The average discharge rate is 390 kg / min, but in the first minute it is about 400 kg in the warm season and about 330 kg in the cold season is discharged from the reservoir. Another output of the software is the radius of gas emission and its concentration for 60 minutes, which shows that in the warm season, 1.5 km of concentration to 20 ppm, in the range of 5 km concentration of 2 ppm, within 10 km of concentration to ppm 0.5. In the cold season, in the range of 1.4 km of concentration to 20 ppm, in the range of 4 km, the concentration of concentration in ppm 2, reaches 6.8 km to the concentration of 0.5 ppm.

Conclusion

It can be concluded from the findings of this study that the release of chlorine gas in the event of damage to its outlet valve in the warm season will be broader than the cold season in general, but it covers the area of hazardous emissions in both seasons to a point in the city. Which includes important uses and high population densities such as the only city hospital, Azad University, Mehr hosing Area, the largest city stadium and a large number of major city departments. Also, this area includes one of the most important links between the two cities of Larestan and Gharash (Dadman Highway), which always has high traffic. According to the location of the station in the direction of the wind direction of the region and the emission range up to 2 ppm, it is clear that the whole area of the new city of Lar is at risk of gas emissions, and it is possible to harm a large number of citizens located at a radius of 5 km from the station Therefore, effective measures such as informing the residents, increasing the level of awareness of the staff and the relief forces, installing proper scrubbers and increasing the level of safety of the station are necessary. According to calculations, diagrams and maps, it is clear that in a radius of 1.5 km the emission is extremely dangerous and deadly, and up to a radius of 5 km, there is a possibility of serious and long-term complications for people and deprives them of the ability to escape. Considering the possibility of such a critical occurrence is very high, it is necessary to first install scrubbers for chlorination stations and the staff of the training station will be trained to deal with this situation. It should be noted that due to the speed of evacuation of materials, it is possible to arrive at the time of other relief forces It is therefore necessary to have the equipment necessary for staff and guards in place so that they can be responded promptly and appropriately in case of occurrence, it seems that, if

possible, alert systems are available for hazardous areas and to People are taught how Faced with this situation.

Keywords: Chlorine gas, Crisis, Water treatment plants, Emergency response plan.

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