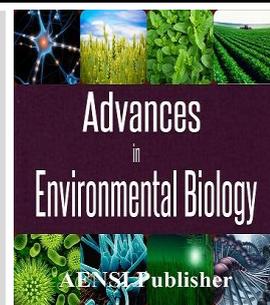




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“Examining the Relationship between Crisis Management and Passive Defense with Security of Oil Installations of Gachsaran”

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ABSTRACT

The aim of the present study is examining the relationship between crisis management and passive defense with security of oil installations of Gachsaran. According to the research literature a model was considered for the study. Two main hypotheses and 6 sub-hypothesis are examined in this research. Population of this research consisted of all staff members of oil installations of Gachsaran, data are collected by questionnaire. Random sampling was used to select the statistical sample, a total of 293 personnel were providing data for this study. To analyze the data, SPSS software has been used. First, the desirability of these variables were tested using one-sample t-test, the positive relationship between variables (research hypothesis) was confirmed by Pearson correlation coefficient. The results indicate that the critical decisions require a suitable model to lead the manager to make correct decisions to determine the team and its operational levels for members based on indices. Also the more coherent and integrated together with greater sense of responsibility they would protect each other during accidents and natural disasters and in such a situation the facilities are good and reliable.

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INTRODUCTION

The oil industry has a special place as a propellant in the economy and having essential role in achieving the objectives of the national economy in the 20-year horizon, is the driving engine of national economy, promoting IRI economic diplomacy and ensuring national security through the development of regional and international cooperation and interactions. While 28% share of GDP, 84% share of foreign exchange earnings, more than 95% share of primary energy supply is undeniable. Studying oil field indices indicate the growing movement has been realized in many aspects of the industry and it can provide desirable conditions in coming years.

South Oil National Company is the most sensitive productive institution in the oil industry and consequently in the country. Since the smallest interrupt in the activities of the company can be associated with many adverse effects so security guards role as a major arm of companies in the region is vast and important. Security providing in all oil fields is for the protection of property, plant and human resources of oil industry. Sustainable security is very important in all stages of production and in this respect, creating protection systems is necessary and inevitable. Regarding the development of science and technology, national Iranian Oil Company security guards has been changed its attitude from traditional to modern security consistent with modern technologies [21]. In fact, passive defense is a set of measures and actions which must be applied using tools and available geo-environmental conditions without the need for manpower so that these measures will increase the ability to defend the oil installations and also reduces the impact of the crisis; Whilst it should be possible to reconstruct the damaged areas by the lowest cost. Crisis management is an important issue of interest to practitioners with more emphasis in recent years. Crises are part of the business environment and removal of all the crises that threaten the organization is impossible [8]. On the other hand, compliance with the existing conditions, adopting the competitive environment and taking advantage of economic mechanisms, Need tools to take more advantage of the created opportunities [22]. In this study we sought to answer the question of how we

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can study the relationship between crisis management and Passive Defense with security of oil installations of Gachsaran.

Research literature:

Crisis Management:

Crisis management is an applied science to avoid disaster by recognizing, observing and analyzing data in a systematic way for finding tools and solutions and on the other hand in case of occurrence, it is necessary to relief and recovery.

Crisis management objectives:

1. Elimination of crisis and emergency
2. The rapid return to normal society.
3. Reducing damage caused by the physical and financial crisis.
4. Reducing the effects of disaster and dealing with it at the lowest cost.
5. Readiness of the community to deal with the crisis.
6. Reconstruction of critical areas in terms of physical, psychological and cultural conditions.
7. Creating training and maneuvers in regions to prepare for crisis management for administrators and people.

Comprehensive Model of Crisis Management (hierarchical model):

In 2006 a number of crisis management experts gathered at the University of Toronto, Canada to determine a comprehensive and integrated model for crisis management: a hierarchical model was presented by Mr. Ian Davies that had 4 levels:

- 1- The ethical model principle
- 2- The strategic model principle
- 3- The tactical model principle
- 4- The Administrative model principle

Ethical Principles: Is to achieve a full recovery after the crisis and culture promotion culture and committing all interest groups.

Strategic principles: focus on planning before the crisis for community basic planning for a crisis.

Tactical principles: managers and government officials' capacity building and empowerment through education and training of employees.

Administrative principle: monitoring and the use of technology to create an enabling society to the crisis through program evaluation, and implementation of the retrofit and reconstruction principles.

Processes or phases of crisis management:

Consists of a series of coordinated, integrated process that involves four steps:

- 1- Prevention step
- 2- Preparation step
- 3- Opposition step
- 4- Reconstruction step

By implementation this process during the crisis damages and the loss of life and property can be minimized.

Prevention means: all measures that prevent the crisis and to prevent the damaging effects of the crisis in society.

Construction of dams: Preventing river flooding, retrofitting buildings against earthquakes

Preparation: All measures to enable the government and people to react quickly and timely and efficiently during the crisis.

A) Increasing anti-crisis plan B) Education and training actions needed in the preparation stage before the crisis:

- 1- Preparing vulnerability plans or urban, rural and industrial high risk areas.
- 2- Preparing vulnerability conversion plan and immunization.
- 3- Preparing administrative plans for the deployment of applications and requirements before disasters and warning.
- 4- Determining the tasks and the number of committees needed for initial relief phase - fuel use - reconstruction phase.
- 5- Determining appropriate locations for temporary accommodation.
- 6- Determining groups and companies public and private organizations for the reconstruction.
- 7- Determining light and heavy machinery and tools and executive factors of reconstruction and rescue [11]

Passive Defense:

A series of measures to retrofit equipment and facilities against intentional and unintentional injuries and reducing the vulnerability of human resources and critical facilities of the country and control and rapid restoration of society to normal conditions. Most attention is to the country's defense during the crisis and critical facilities such as hospitals, oil refineries and gas stations, nuclear power plants, etc – very important facilities and infrastructures [5].

Factors affecting passive defense:

Establishing enabling environment:

Six tasks are mentioned for management crisis including: planning, partnership, organization, utilization of human resources, leadership and supervision. This classification is comprehensive and it can be said that all of the crisis management and its four pillars are located within the six tasks. This classification can be considered as a practical classification because it shows some functions that managers know them and act on them.

Extensive research on the consequences and the global financial damage of natural disaster has been done in some countries in recent years indicate that there is no crisis preparedness and crisis has been dealt with ineffectively and unscientifically. Moreover, crisis management has been incompetent, clumsy and untrained.

The importance of crisis management cannot be realized nowhere as in the developing countries. Economic development experts have shown that growth does not appear by providing money, as in many cases technical knowledge has been a deterrent. While human has had revolutionized progress in the physical and biological sciences But cultural and social sciences are backward.

Determining security levels:

Crisis management massive targets:

- 1- Immunization vital critical centers.
- 2- Qualitative and quantitative development of specialized human resources.
- 3- Improving conservation of the country in crisis.
- 4- Increasing threshold of national resistance and strengthening components of resistance to threats.
- 5- Developing culture and creating a general belief in the efficacy of passive defense in reducing vulnerability.
- 6- Achieving sustainable security in development and stabilization country's critical infrastructure.
- 7- Research, producing science and technology and developing culture and changing it into public education.
- 8- Completing cycle of the country's defense and positive interaction with the active defense and passive defense.
- 9- Institutionalizing the principles and criteria of passive defense in development plans leads to classification centers.
- 10- Reducing the vulnerability of the country and representing the national authority of it as one of the inhibitory components.
- 11- To minimize the effect of enemy military threats on critical and important infrastructures.
- 12- Qualitative and quantitative development of capacity and the performance of passive defense in the body of country engineering (consulting and implementation).

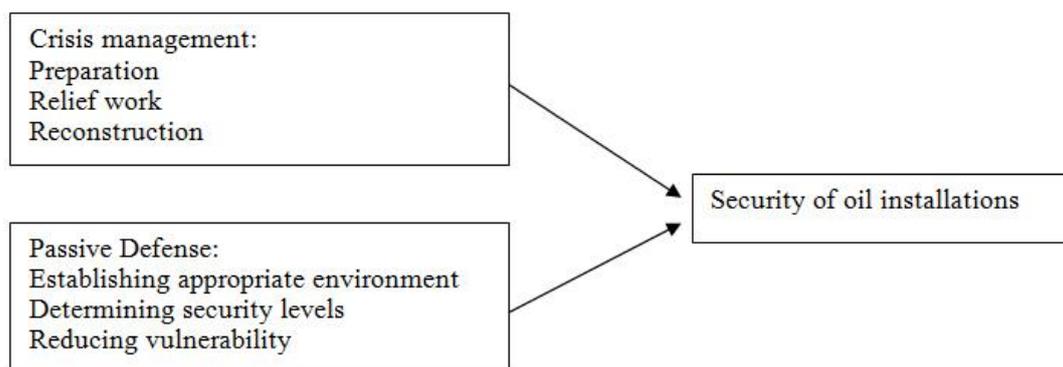


Fig. 1: The proposed conceptual model.

Reducing vulnerability:

The overall objective is optimization activities in response to the crisis and minimizing the damage caused by it. In non-commercial entities, such as the County's and also in business units, such as services companies that are not responsible for the overall benefit, managers have some goals and should try to achieve them by using minimal resources. In crisis management improving efficiency is necessary with respect to its operational crucial importance. First we assume time management in which the project manager is required to reduce costs

and time of the projects and increase the number and quality of projects and activities to achieve the objectives. In other words, the onset of response and mitigation, relief and reconstruction operations cost should be reduced. On the other hand the volume of preparedness, relief and reconstruction, the quality of preparedness, relief and reconstruction, the level of preparedness to deal with crisis and reconstruction normalization efforts should be increased.

Research hypotheses:

The first main hypothesis:

There is a significant and positive relationship between crisis management and security of oil installations.

1-1: There is a significant and positive relationship between preparation and security of oil installations.

1-2: There is a significant and positive relationship between relief work and security of oil installations.

1-3: There is a significant and positive relationship between reconstruction and security of oil installations.

The second main hypothesis:

There is a significant and positive relationship between Passive Defense and security of oil installations.

2-1: There is a significant and positive relationship between establishing appropriate environment and security of oil installations.

2-2: There is a significant and positive relationship between determining security levels and security of oil installations.

2-3: There is a significant and positive relationship between reducing vulnerability and security of oil installations.

Research method:

The research is applied and its nature is correlation. The population of the study consists of all the staff of oil installations of Gachsaran (over 6.000). To determine the sample size Cochran formula was used for unlimited communities. Sampling method is simple random. Finally, 293 questionnaires were examined. In this study, a method for collecting a library of literature and field research questions was used to collect. The main data collection tool is the researcher made and standard questionnaire that has been used. The study questionnaire consisted of 33 questions to measure 7 variables. These questions are designed based on the 5 division Likert scale. These questions have been raised as described for measuring variables: Question 1 to 18 are for the measuring crisis management variable, question 19 to 24 are to measure passive defense variables and questions 25 to 33 are to assess the security of oil installations variable.

Data analysis:

Table 1: The Kolmogorov-Smirnov test to verify the normality of research variables

variable	n	K-S	significance (P)
preparation	293	0.58	0.36
Relief	293	0.84	0.20
reconstruction	293	1.06	0.12
Crisis management	293	1.18	0.11
Establishing appropriate environment	293	0.98	0.20
Determining security levels	293	1.10	0.21
Reducing vulnerability	293	0.79	0.25
Passive Defense	293	0.66	0.77
Security of oil installations	293	1.04	0.23

The results of the above table show that all variables' significance amount is larger than the alpha value that is 0.05. We conclude that the variables obey the normality assumption. One-sample t-test was used to compare the difference of the sample mean and the community mean and to investigate the desirability of study variables. Since the range of questionnaire scoring has been a 5-point Likert therefore the average of the community was considered as 3.

Table 2: one-sample t-test to evaluate the utility of research variables

variable	mean	SD	Mean difference	T-test	FD	significance (P)
preparation	3.68	0.80	0.68	14.66	292	0.001
Relief	3.62	0.82	0.62	13.01	292	0.001
reconstruction	3.82	0.98	0.83	14.46	292	0.001
Crisis management	3.71	0.74	0.71	16.28	292	0.001
Establishing appropriate environment	3.63	0.71	0.63	15.28	292	0.001
Determining security levels	3.49	0.85	0.49	9.83	292	0.001
Reducing vulnerability	3.69	0.87	0.69	13.53	292	0.001
Passive Defense	3.60	0.70	0.60	14.77	292	0.001
Security of oil installations	3.70	0.76	0.70	15.62	292	0.001

The results of independent t-test showed that in all research variables there is a significant relationship between the community mean and the sample mean ($p < 0.01$). The comparison suggests that the sample has obtained greater mean than the community in all aspects. In other words, the sample has higher utility than the society in these aspects. Pearson's correlation coefficient was used to test the research hypotheses.

Table 3: The first research hypothesis test

Test results	Security of oil installations	Variable	
There is a significant relationship	0.62	The correlation coefficient	Crisis management
	0.001	significance	

Table 4: 1.1 Research hypothesis tests.

Test results	Security of oil installations	Variable	
There is a relationship	0.56	The correlation coefficient	preparation

Table 5: 1.2 Research hypothesis test.

Test results	Security of oil installations	Variable	
There is a significant relationship	0.56	The correlation coefficient	relief

Table 6: THE 1-3 research hypothesis test.

Test results	Security of oil installations	variable	
There is a significant relationship	0.59	The correlation coefficient	reconstruction
	0.001	significance	

Table 7: The second research hypothesis test

Test results	Security of oil installations	variable	
There is a significant relationship	0.69	The correlation coefficient	Passive Defense
	0.001	significance	

Table 8: The 2-1 research hypothesis test.

Test results	Security of oil installations	variable	
There is a significant relationship.	0.68	The correlation coefficient	Establishing appropriate environment
	0.001	significance	

Table 9: the 2-2 research hypothesis test

Test results	Security of oil installations	Variable	
There is a significant relationship	0.58	The correlation coefficient	Determining security levels
	0.001	significance	

Table 10: the 2-3 research hypothesis test

Test results	Security of oil installations	Variable	
There is a significant relationship	0.53	The correlation coefficient	Reducing vulnerability
	0.001	significance	

Research question:

"What percentage of the variance of security of the oil installations is predicted by passive defense and crisis management aspects?"

To examine this question the effect of crisis management components (preparedness, relief, reconstruction) and passive defense components (establishing appropriate environment, determining security levels, reducing vulnerability) on security of oil installations is used. In the first step crisis management and its components; and in the next step Passive Defense and its aspects, have entered into the regression equation.

Table 11: Variance analysis of the effect regression of passive defense components and crisis management components of security of oil installations

model		Sum of squares	FD	MS	F	sig	The correlation coefficient (r)	The coefficient of determination (r^2)
The first step	regression	69.78	3	23.261	66.075	0.001	0.63	0.39
	The remaining	101.74	289	0.35	-	-		
	total	171.52	292	-	-	-		
The second step	regression	92.57	6	15.42	55.89	0.001	0.73	0.52
	The remaining	78.95	286	0.27	-	-		
	total	171.52	292	-	-	-		

The results in the table above show that the F observed by analysis of regression variance, comparing with the critical values, is significant ($P < 0.05$). Thus we can speak of a linear relationship between the variables.

Also according to the adjusted coefficient of determination it is clear that at the first step the components of the crisis management (preparedness, relief, and reconstruction) are able to predict 39% of the variance in security of oil installations. At the second step, the components of crisis management (preparedness, relief, reconstruction) and passive defense components of (establishing appropriate environment, determining the security levels, reducing vulnerability) have ability of predicting 52% of the variance in the security of oil installations.

Table 12: Statistical characteristics of the effect regression of crisis management components and passive defense components of security of oil installations

	variable	Not standardized regression coefficients B	SEB	Beta	T-test (t)	sig
First step	preparation	0.25	0.25	0.27	1.01	0.32
	Relief	0.00	0.24	0.00	0.00	1.00
	reconstruction	0.01	0.25	0.01	0.04	0.97
	Crisis management	0.83	0.71	0.83	1.17	0.24
The second step	preparation	0.06	0.23	0.07	0.28	0.78
	Relief	0.17	0.22	0.18	0.77	0.44
	reconstruction	0.05	0.22	0.06	0.23	0.82
	Crisis Management	0.08	0.65	0.08	0.12	0.90
	Establishing enabling environment	0.07	0.06	0.06	1.06	0.29
	Determining security levels	0.10	0.05	0.11	1.83	0.07
	Reducing vulnerability	0.35	0.05	0.41	6.87	0.00

The results in the table above show that the standard Beta of reducing the vulnerability variable is significant ($P < 0.05$). In other words, the standard deviation changing in variable of reducing the vulnerability changes the security of oil installations 0.41 of standard deviation. Passive Defense variable was excluded from the regression equation.

Discussion and suggestions:

The first main hypothesis: There is a significant and positive relationship between crisis management and security of oil installations of Gachsaran oil industry. The obtained results of data analysis confirmed this hypothesis and the following suggestions can be stated in line with this hypothesis.

- Identifying signs of crisis will increase the organization recognition to the kind of crisis, and it is natural if the organization knows what kind of crisis it encounters, the easier it will be to deal with it and thus it can be able to contain the crisis and its consequences are minimized. The relationship between prevention and crisis preparedness and recovery and learning is discussed subsequently.

- Management can help organizations to control the future with creative and innovative ways, and institutionalize balance and stability in their organization by managing crisis and provide background necessary to predict and control the crisis and provide security for oil installations.

- Also studies have been done by Nelson [13] and Troit and Kiley [24], Rezaei [18], Rafiean [17], Bahrampoor [3], Jamshidi [7], Mehdinezhad (2012) and Sahami [20] confirm the hypothesis.

1-1: There is a significant positive relationship between the preparation and the security of oil installations of Gachsaran oil industry. The obtained results of data analysis confirmed this hypothesis and the following suggestions can be stated in line with this hypothesis.

- Organizations should make greater efforts to enable staff and creating effective work groups so that their members to become more committed to their work and consider themselves as part of the organization. On the other hand they should emphasize cooperation and consensus on the issues more to create common views in different parts of an organization and to create a good balance of different levels to facilitate the cooperation initiatives in passive defense plans and future disasters, especially natural disasters, like flood that its probability is high in this area, and thereby provide security of facilities.

- In a survey by Osanloo (2011), Mazloomi [10], Taylor [23], Protogerou *et al* (2008), Nourollahi. *et al* (2013) and Merilis (2010), similar results have been achieved.

1-2: There is a significant positive relationship between relief and the security of oil installations of Gachsaran oil industry. The obtained results of data analysis confirmed this hypothesis and the following suggestions can be stated in line with this hypothesis.

- In critical decisions always an appropriate and swift model is required to lead manager to the correct decisions for the team determination and determining operational levels according to indicators of its members.

Also, in a study by [5] and [9] this hypothesis was also confirmed.

1-3: There is a significant positive relationship between reconstruction and the security of oil installations of Gachsaran oil industry. The obtained results of data analysis confirmed this hypothesis and the following suggestions can be stated in line with this hypothesis.

- It is clear that numerous problems removing in the current process of building oil installations require appropriate corrective measures and spending large amount of time and coordination of various aspects between the organizations and those involved in the constructing buildings.

- Also, in a study by Mokhtari (2011) and Poormosavi [15] this hypothesis was confirmed.

The second main hypothesis: There is a significant and positive relationship between passive defense and security of oil installations of Gachsaran oil industry. The obtained results of data analysis confirmed this hypothesis and the following suggestions can be stated in line with this hypothesis.

The following items can be mentioned for managing the crisis and passive defense to secure the oil installations better: 1- Creating crisis committee comprised of 10 senior executives 2-establishing the necessary committees 3- Determination of the crisis domain (minimum and maximum risk) by specific the investigation committee. 4- Prioritizing problems by the Planning Committee and estimating propagation velocity of crisis and specifying the short and long term goals by the crisis staff. 5- Determining information required by the planning committee in order to prevent the spread of the crisis According to the initial objectives and its referral to the Committee of Information 6. Information and communication committees' cooperation to provide input for the planning committee 7- Providing documentation to the Planning Committee by investigating committee and examining the current status in terms of communication of resources and their interests by planning committee 8- According to information obtained by the information committee, investigating the causes of the crisis and analyzing them by the Planning Committee 9. Studying the primary objectives and modifying them according to data from recognizing the current status and analyzing them by the planning committee in cooperation with other committees. 10. Selecting the best solutions according to their priority by the Planning Committee considering restrictions 11. Implementation supervision, continuous improvement of solutions by committee and under the supervision of staff of preparation chart and Crisis and disaster management structure

- Also studies conducted by Delavar and Jalali (2009) and Minar in 2007 confirm the hypothesis.

2-1: There is a significant and positive relationship between establishing appropriate environment and security of oil installations of Gachsaran oil industry. The obtained results of data analysis confirmed this hypothesis and the following suggestions can be stated in line with this hypothesis.

- Geotechnical studies help to reduce vulnerability of natural disasters and identifying land subsidence and improving the quality of construction of oil installations. Studies show that there is a significant relationship between conducting detailed geotechnical investigations and reducing damage caused by subsidence of land. Since local surveys are not done in all buildings geotechnical studies, so the complete control of field operations of these studies are necessary.

- Also, in the study conducted by Pollard [14] [16] similar results were achieved.

2-2: There is a significant and positive relationship between determining security levels and security of oil installations of Gachsaran oil industry. The obtained results of data analysis confirmed this hypothesis and the following suggestions can be stated in line with this hypothesis.

- Staff training can also improve the management processes of the crisis and passive defense with its consequences. When someone learns a skill or tips and tries to transfer his knowing to others, this skill can be useful in conditions of crisis and disaster. Someone who knows how to act in the event of natural disasters and teaches to the others can be an effective and useful, at least for himself and others.

In a study by Thompson this hypothesis was also confirmed.

2-3: There is a significant and positive relationship between reducing vulnerability and security of oil installations of Gachsaran oil industry. The obtained results of data analysis confirmed this hypothesis and the following suggestions can be stated in line with this hypothesis.

- According to the above description solution that is considered and has been applied in different countries such as America, France, and ... is practical legislation for the immediate establishment of an institution or organization in the event of a disaster and problem in oil installations and with the rapid formation and revision of accidents, deliberate decisions are made thereby preventing the occurrence of various other disasters.

- Also, in a study by [16,1,15] this hypothesis was also confirmed.

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