

Provide a Post-crisis Water Supply Solution in the Branch of District 3 of Tehran

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Abstract

Evaluating and reducing various risks is a part of the corporations and organizations policies, any economic and non-economic entity must inevitably pay particular attention to the stage after the crisis in order to lead the organization's missions, carry out missions of the organization, and to reduce the costs and expenses of the various crises. A closer look can be said that the management system of continuity of activities and services tries to prepare the organization for a proper and timely response to the crisis (crisis management) to a level of readiness that can be found in the shortest possible time to resume on a timely basis, based on predefined plans, the provision of services to customers (continuity of service and activities), and preferably the transition from a critical to a normal state (recovery). In this research, after expressing the theoretical foundations in the field of crisis management and standards of continuity of activities and services, the headquarters of the water and wastewater company of district 3 of Tehran, which has been selected as a case study, has been investigated. An attempt has been made to extract the indicators for the company's headquarters by investigating the principles of standards BS-25999 of the British Standards Institute regarding the continuity of activities and services, and then, by submitting a questionnaire and analyzing the results of the questionnaire through SPSS19 software and Expertchoice11 data for the continuity plan to be used for the case study to be localized. In the end, a post-earthquake continuity and continuity plan has been proposed in the headquarters of Water Treatment Company, District 3 of Tehran, in which the necessary measures for the continuation of activities before, during and after the accident, and the organizational chart and the description of each task are specified. In this way, the company is ready to face the crisis and can resume its business in the best possible time and can take the transition from a critical state to a normal state.

Keywords: Crisis Management, Earthquake, Standard BS-25999, Continuity Scheme of Activities and Services.

Introduction

All businesses are exposed to a variety of unforeseen crises. These crises range from natural disasters to fire, theft or destruction of key information, the spread of infectious diseases, labor

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strikes, financial crises, and even terrorist activities. In other words, although identifying, evaluating and reducing various risks is part of the policies of different companies and organizations, but any economic and non-economic entity, in order to continue the organization's survival, carry out its mission, and also reduce the number of injuries and the costs of various crises are bound to give special attention to the aftermath of the crisis.

A closer look can be said that the management system of continuity of activities and services tries to prepare the organization for a proper and timely response to the crisis (crisis management) to a level of readiness that can be found in the shortest possible time to resume on a timely basis, based on predefined plans, the provision of services to customers (continuity of service and activities), and preferably the transition from a critical to a normal state (recovery).

Water and sewage companies, both urban and rural, have a legal responsibility to provide safe drinking water to consumers at a standard level that is of a health and quality standard. Disturbance in water quality and its distribution can be caused by emergencies such as natural disasters, unexpected events and deliberate acts. Any disturbances in the quality and availability of safe drinking water after a natural disaster can cause very large disturbances in the city and add to many problems during the crisis. Therefore, continuity of the activities and services of this unit during a natural disaster such as earthquakes can help to manage the crisis and increase the flexibility of the city and make the city quicker to its normal state (Dhofir, 2015).

The continuity of the activities and services, the information set and the written procedures for use in an accident are acceptable in order to continue vital processes at a predetermined level. The recovery steps are a process by which a business can resume after an accident. With regard to the human tendency toward clear horizons, many managers are prone to disregarding the disaster recovery process because incidents are usually unlikely. The continuity of disaster-based operations and services offers a more comprehensive approach, which assures managers of an organization that they can manage their money not only for planning after a natural disaster, but also for smaller events such as illness or the departure of key personnel, problems Corporate chains and other challenges they face in the business process at any given time (Ghiyah Qi, 2014).

One of the most important factors in increasing or decreasing the number of casualties and human casualties in the event of a natural disaster is the existence or absence of a crisis management system. Taking into account the specific features of natural disasters, the management of disasters caused by natural disasters has had a lot of complexity and urgency and requires special measures.

One of the methods that can be used to prepare and formulate the principles of crisis management and planning and has recently been used in crisis management books is to use the comprehensive crisis management process and its phases to classify and provide principles (Alexander, 2002; Coppola, 2007). In this model, the principles of crisis management are divided into four phases (prevention and mitigation of impacts, preparedness, coping, rehabilitation) that involve both planning and management (Joseph, 2010).

Materials and Methods

In this research, library studies, referrals to relevant organizations and field visits, and interviews with experts on urban issues and crisis management have been used. Analytical Hierarchy Process Analysis (AHP) has also been used for analyzes, which is a flexible, robust and simple method used to decide where alternatives to decision-making criteria make choices between

options difficult. This method significantly reduces the conceptual complexity of decision-making because only two components (binary comparison) are examined at a time. The research method is a descriptive-analytical method and data analysis method is using inferential statistics. The data gathering tool was a questionnaire and a tool for collecting information from library studies and field surveys (Carter, 2008).

Using the library studies and using international experiences in the area of continuity of service and after crises services, the overall framework of the project has been extracted first. Then, a questionnaire was designed to fill the sample and localize it for the headquarters of Water and Wastewater Company of District 3 of Tehran. The information was collected through library studies and interviews with experts. After the compilation, these questionnaires were distributed among experts in the field of crisis management, water and wastewater in the district 3 of Tehran (Fallah Ali Abadi, 2013).

In the first part of this questionnaire, the necessary measures for the continuation of activities before, during and after the accident in the headquarters of the water and wastewater company in the district 3 of Tehran have been questioned. After collecting questionnaires, this part of the questionnaire was analyzed using SPSS19 software and binomial test. The output of this test is put into continuity plan. In the second part of the questionnaire, questions have been asked through the hierarchical structure, the command and control of the accident at the company, as well as the alternative sites for the continuation of the post-traumatic enterprise's activities and services. The relevant experts have rated the indexes and variables questioned according to AHP principles. Finally, using the Expert choice 11 software and analyzing the scores given by experts, the option highlighted for this question has been identified.

In this research, the preference, during and after the accident are designed to prioritize, in order to plan the continuity of the activities and services of the district office of the District of Tehran (Hafez Nia, 2011). The first part of the questionnaire is divided into two sections; the first part contains questions about the personal characteristics of the respondents ; Age, gender, level of education, work experience ..., and the second part includes actions taken through library studies and similar examples and included in the two tables of pre-disaster measures and post-traumatic measures. The scale used is also Likert Option 5. In order to measure the credibility of the questionnaire, the opinions of experts and mentors of guidance and consultants have also been used (Coppola, 2007). The questionnaire was distributed among experts and officials of the District 3 Water and Wastewater Company of Tehran, as well as experts in crisis management and emergency situations in the 3rd district of Tehran. Due to the limited number of experts in the field of emergency management in the area of water and wastewater, the number of statistical population is 25. The statistical method used in this research is descriptive statistics, is inferential. In this type of statistical method, the researcher calculates using the Likert spectrum and the sample values of the statistics. Then, with the help of estimates and statistical assumptions, the statistics are generalized to the community (Booth, 1993).

Applying quantitative and quantitative criteria simultaneously and also the ability to adapt to judgments are features that use the AHP method to determine the coefficient of significance of the parameters used in the research, to identify and select the appropriate alternative site, and to command the plan to continue the activities of the headquarters of Water and Wastewater Company after Earthquake events. The first step in the hierarchical analysis process is to create a hierarchical structure of the subject in which the goals, criteria, options, and the relationship between them are shown (Ghafouri, 2010). The next steps in the hierarchical analysis process, which will be used in this research, will be to calculate the weight (importance factor) of the criteria, to calculate the weight (coefficient of importance) of the options (different types of

alternative sites and different individuals for the command responsibility of the design), and finally, The logic of judgments (Abbas Nejad and Hasanzadeh, 2009).

Water and Wastewater Company of District 3 of Tehran has been responsible for distribution of drinking water and sanitary and sanitary wastewater collection in Tehran's urban areas and in 2015, in order to continue to provide better services to the noble people of Tehran, the water supply of Tehran province was registered. The area is 81.5 square kilometers and the population is about 1,861,719 people. The region has 17 reservoirs with a total volume of 435,900 cubic meters and a distribution network of 1,426 kilometers, which has 15937 distribution valves and 147 valve valves. The difference in height is the lowest and highest points in the flood area of Tehran region 551.5 and has 3 subscriber and operation areas and 24 relief units.

Discussion and analysis

The continuation of the post-earthquake service and services for the District of Tehran's District Department of Tehran is defined in response to unexpected changes in the work environment of the District Officer of the District 3 of Tehran and outlines the steps required to perform in this company in the event of an earthquake and Disturbs the company's normal activities. This document summarizes the necessary measures before, during and after the crisis in order to continue the company's activities and services, and to validate the company after the earthquake, ensuring the integrity of the data, and the activities necessary to return to the normal business processes. And it works (Beridian, 2008).

The first step for disaster management and continuity of post-traumatic incident services and services is to have a responsive organizational chart that addresses all of the needs of the post-disaster incident and provides the conditions for business retrieval. In this part of the plan, a responsive organizational chart is presented. To characterize the crisis management with continuity approach, parameters such as organizational power of the individual for commanding in times of crisis, and performance and better performance during the crisis were evaluated by experts. Scoring and prioritization is done using the AHP method. In the figure 1, the results of this analysis are shown by entering information from 10 expert experts in Expertchoice11 software.

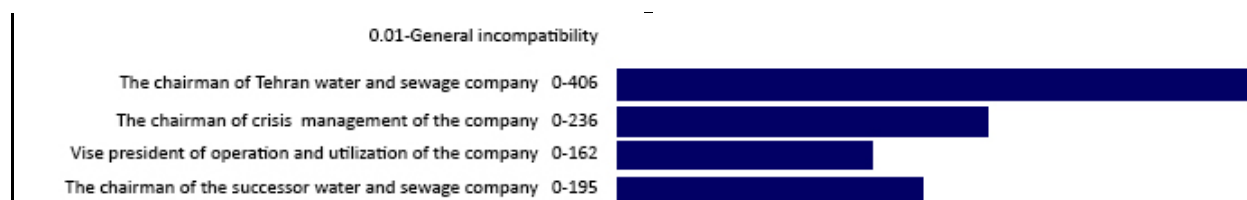


Figure 1. Results from Expert choice software to select Crisis Command

As shown above, the head of Tehran District 3 water and waste water company has been selected as the best center for crisis management from the perspective of experts. According to expert opinion and library studies in this area, the following organizational chart is proposed in figure 2.

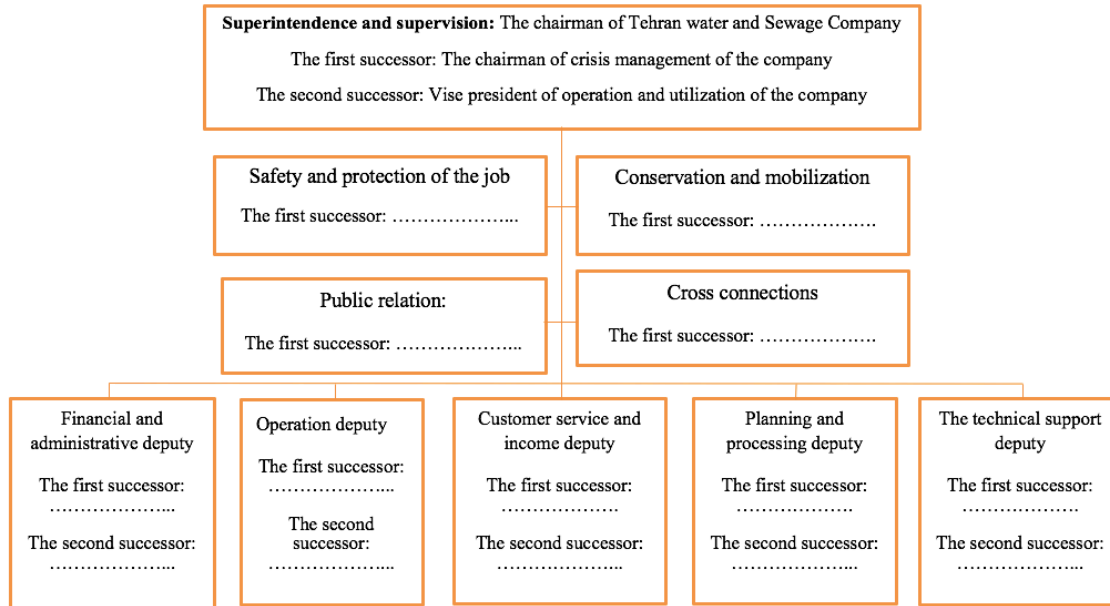


Figure 2. Organizational Chart of District 3 Water and Wastewater Company of Tehran after the accident

The right answer to a crisis in an organization requires a team to lead and support response and recovery operations. Team members should be selected from experienced and trained staff who are aware of their responsibilities (Leader, 1998). The number and scope of the teams' activities can include:

Commands and control teams that include a crisis management team and a response, continuity or retrieval management team. Operational teams that could include an alternative site team, a logistics and contracting team, a rescue and injury assessment team, an economic team, a hazard team, an insurance team, a legal task team, an alternate communications team, a mechanical equipment team, an intermediate team or A central processor, a warning team, a local team or personal computer team, a PR and media team, a transportation coordination team, and a record management team. The tasks and responsibilities of each team include identifying members and team structure, recognizing team specific tasks, roles and responsibilities of members, establishing contact lists and identifying alternate members. There should also be instructions for teams that, in the event of loss of personnel or lack of availability of them, other teams can carry out the tasks and tasks of the team. This can be done by providing cross-curricular education.

To select the alternative site type, all factors are considered, including threats and risks, the maximum allowed time for inactivity, and the costs of equipping and maintaining it. Some organizations employ hard-core sites for security reasons. Hard sites include security features that minimize disruptions. These sites may have alternative power requirements and the ability to provide backup power, high levels of physical security, and protection from interference and electronic surveillance (Asgary and Willis, 1997).

To select the alternative site to continue the organizational life of the water and wastewater company in District 3 of Tehran, parameters such as organization policy, cost of equipping and maintenance, earthquake vulnerability and the maximum time allowed for non-activities of the company were evaluated by experts, and options were considered based on The AHP guidelines are scored against each other. Then these points were entered into Expert choice 11 software and analyzed. The results are as follows in Figure 3.



Figure 3. Expert choice results for choosing an alternative site

As shown above, according to the above mentioned indicators, experts have given the highest rating to the hot site, and the hot site is in the second place.

Conclusion

Iran is one of the ten major incidents in the world. Disasters such as earthquakes, floods, climate change and climate instability, and so on, are very common in the country. Of the 43 types of incidents identified in the world, 33 of them can be seen in Iran. Geographic situation, environmental conditions and population dispersion have increased the variety and frequency of natural events in Iran. Therefore, it is necessary to take measures in places and structures that are important or functionally higher than the level of vulnerability, so that, in critical or emergency situations, the initial steps for coping and responding to the same location are removed. A more explicit statement of the crisis is being managed at the same location and initial measures to tackle and reduce vulnerability (Asadi, 2000).

With regard to the human tendency toward clear horizons, many managers are prone to disregarding the disaster recovery process because incidents are usually unlikely. The continuity of disaster and post-incident services offers a more comprehensive approach, which assures managers of an organization that they can spend their money not only for planning after a natural disaster, but also for smaller events such as illness and exit of key personnel, chain problems the company and other challenges they face in the business process at any given time.

The continuity management system of services and services tries to provide the organization with a readiness to prepare itself for a timely and appropriate response to the crisis, which can provide services in the shortest possible time based on predefined plans. Resuscitate its customers and go to the best of the transition from a critical state to the normal state. Proper implementation of this plan, while providing the ability to respond appropriately to crises and reduce the time to return to normal could provide a variety of Including an extension of the proactive approach rather than passive in dealing with the crisis, reducing the cost of insurance.

A continuity plan is a document that describes how to protect the lives and property of employees after a tragedy, and describes the activities to be undertaken in response to it. It also specifies the details of what should be done by the components organized at specific times and places, based on the assumptions and schedules considered. This plan introduces a set of measures before, during and after an accident and, based on the organizational structure defined for the District 3 of Tehran, the water and wastewater company, describes the tasks assigned to each part in relation to these measures.

To determine and select the actions before, during and after the accident, first a list of actions was prepared according to library studies, then using the question of experts in the field of accident management, water and wastewater and analysis of the results using the binomial test As

well as the SPSS19 software, the steps have been taken to continue the activities and services of the post-earthquake company (Asgary, 2006).

The large water network in Tehran has never been designed for crisis situations, and no predictions have been made about it. As the water crisis of the year 80 aroused many problems for the city's water affairs administration. Participation in high levels of management plays an important role in the proper introduction of the processes of continuity of activities and services, its support and culture-building in the organization (Derakhshan Fard, 2010).

The lifecycle management of service continuity includes six sections. These parts can be implemented and implemented in any organization and in any size. It should be noted that the type of organization (government, private, nonprofit, educational, productive, etc.) does not affect the elements of this cycle. Of course, the outlook and structure of the continuity management program, as well as the amount of follow-up and investment, can vary with each other depending on the circumstances of each organization, but nevertheless, these parts should be done. The scope and structure of this program can be Different and activities will expand according to the specific needs of each set.

In the first step, the continuity plan for an activity and service should include an organizational structure often defined as a committee that provides senior executives with a guarantee of senior executives, and defines the role of senior executives and their responsibilities. Here, after examining the standard BS -25,999, and the localization of this standard, based on the organizational criteria of the water and sewage company, led to the presentation of a continuity committee of pre-crisis services and services and a responsive organizational chart at the time of the crisis (Asgharpour, 2008).

Also, to determine the most effective manager for emergency management in order to continue the activities and services of the water and wastewater company in Tehran's 3rd district and return to normal, a questionnaire was prepared which after asking experts and scoring based on AHP principles and finally analyzing the results This questionnaire, through Expertchoice11 software, concluded that the head of the District 3 water and sewage company in Tehran would be the best way to do this (Bahrain, 2013).

One of the important issues in continuity of service and activity is to anticipate and designate an alternative site to continue the company after the crisis. Among the proposed options, according to criteria such as organizational policy, the cost of equipping and maintenance, the vulnerability to earthquake and the maximum time allowed for lack of activities of the company, as well as the question of relevant experts and experts, and rating based on the principles of AHP and the analysis and Analysis of the results of the questionnaire was selected by Expertchoice11 Hot Site as the best site for continuation of the activities and services of the water and wastewater company in District 3 of Tehran. The hot site is a fully equipped and multipurpose site that also has personnel at the time of the accident. This site can be activated in the shortest time after an accident, and it can be done in the time of the accident before the accident. To ensure that the continuity plan is always up-to-date and reliable, it should be continually tested and reviewed, as proposed in the projected timeframe of 2 years for this issue.

Suggestions

One of the important issues in continuity of service and activity is to anticipate and designate an alternative site to continue the company after the crisis. Among the proposed options, according to criteria such as organizational policy, the cost of equipping and maintenance, the vulnerability

to earthquake and the maximum time allowed for lack of activities of the company, as well as the question of relevant experts and experts, and rating based on the principles of AHP and the analysis and Analysis of the results of the questionnaire was selected by Expertchoice11 Hot Site as the best site for continuation of the activities and services of the water and wastewater company in District 3 of Tehran.

- A complete understanding of the components of the crisis management cycle, the identification of policies and executive guidelines, as well as the identification of the organizations and centers responsible for each of them is necessary.
- Consideration of an independent committee to manage the continuity of activities and services in a company and to establish coordination among other relevant organizations.
- Conducting regular meetings with the presence of the components of the incident command system and the Continuing Committee in the headquarters will lead to further coordination of the relevant working groups.
- Inviting the authorities of related organizations to attend meetings and hold reflection sessions to provide solutions to the problems of the project to help develop the continuity plan of the activities and services provided.
- Measures to retrofit buildings, facilities and sites with the participation of water and wastewater companies and relevant experts in the field of urbanization and rehabilitation.
- Use international experience and expertise in crisis management and management of the continuity of activities and services, and the results will be localized based on the country's management system.
- University and non-academic research and all-round support for crisis management issues in the water and sanitation sector.
- Awareness of the continuity plan of the activities and services and responsibilities of the responsible persons and personnel of the company through conducting maneuvers and attending training classes.
- In this research, only an earthquake tragedy has been investigated, but a company with other disasters can also crash and disrupt its activities. So it is best to look at other accidents so that a comprehensive plan can be obtained.
- A vulnerability matrix should be developed to assess the company's vulnerability to various disasters, as well as an analysis of the impact of those accidents on the business.
- Use of economic analysis to determine whether a plan is feasible is mandatory.
- Finally, according to the results of the research, a conceptual model for the organizational chart of the water and wastewater company in Tehran's area 3 during natural disasters such as earthquake, in order to continue the activities and services headed by the head of the Sewage and Wastewater District 3 of Tehran as the best person for crisis management From the experts' point of view, it is chosen and presented. According to expert opinion and library studies in this area, the following organizational chart and chart are proposed.

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