

## **DISASTER PLANNING: PREPARING FOR THE UNEXPECTED**

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### **ABSTRACT**

How prepared are you for emergencies that occur at any time in your community or facility- a fire, a bomb threat, a chemical leak that emits toxic fumes, a flood, a hurricane, tsunami or tornado? Following is some practical advice designed to provide direction and procedures for the development and implementation of a comprehensive disaster preparedness program, for either natural or manmade emergencies and disasters.

It is essential to design plans of action in the event of a disaster to ensure the safety and well being of individuals and property. This disaster action plan will provide established procedures and guidelines for the management and staff to follow in the event of a disaster. The plan will assist in the protection of life and property by preparing individuals of the community or facility with a plan of action, reducing the unknown or unexpected, anticipating potential problems, determining possible solutions to disaster related problems, and establishing recommendations that will improve the readiness of the community in the event of a disaster.

### **INTRODUCTION**

How prepared are you for emergencies that occur at any time in your community or facility-a fire, a bomb threat, chemical scare, flood, hurricane, tsunami, etc. The basic need for assistance during and after disasters has been stressed the past thirty years in all nations and this presentation will focus on some of the unique problems of Hurricanes Katrina, Andrew, and the tsunami of Indonesia. Following is some of the practical advice designed to provide direction and procedures for the development and implementation of a comprehensive disaster preparedness program, for either natural or manmade emergencies and disasters.

It is essential to design plans of action in the event of a disaster to insure the safety and well being of individuals and property. This disaster action plan will provide established procedures and guidelines for the management and staff to follow in the event of a disaster related emergency. The plan will assist in the protection of life and property by preparing individuals of the community or facility with a plan of action, reducing the unknown or unexpected, anticipating potential problems, determining possible solutions to disaster related problems, and establishing recommendations that will improve the readiness of the community in the event of a disaster. The good Samaritans, volunteers, bystanders, survivors,

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governmental agencies, and the family should realize that a well-coordinated emergency response plan that fully capitalizes on currently available assets is a very valuable resource.

Disasters both major and minor, occur frequently enough that one can evaluate each occurrence and comparatively analyze the problems. There are victims in all disasters. Most individuals and organizations responding to a disaster have not had prior experience, and since an immediate response to victims' needs is so vital, there is a tendency to see the situation and the response it requires, as unique. Studies show that individuals and teams can be assembled in advance and trained in disaster control and remedial action to aid victims.

While the functions of emergency management have been performed for decades by government and other organizations, it was only recently that the broader ideas about managing emergencies were developed. Consequently, with Hurricane Katrina the objective was to use available resources and capabilities in order to effectively deal with this disorder, but there was very little pre-planning.

Today my primary emphasis is to focus on the social disruption caused by disasters and investigate the role of the various agencies that can play in relief and recovery operation of disasters. This is a particularly useful way of examining disasters, since disaster agents create demands with which a community must cope. Hurricane Katrina was one of the largest disasters to hit the US. Based on the combined casualties, damage, and disruption, Katrina was clearly a catastrophe and the most devastating natural disaster in the history of the United States. There were more than 1,300 fatalities, and the damage covered more than 90,000 square miles, with more than a million people driven from their homes. The financial cost of Hurricane Katrina has been projected at more than 200 billion dollars. Many U.S. federal agencies have been criticized for their slow response and the aftermath that continues even today. As a matter of fact, two recent reports from the GAO (Governmental Accounting Office) have been very different. The report praised the U.S. Coast Guard while FEMA (Federal Emergency Management Agency) was criticized for their slow response. The U. S. Coast Guard, that today is one of the twenty-two agencies under the Department of Homeland Security (DHS) played an exemplary role in the aftermath of Katrina.

## **VULNERABILITY ANALYSIS**

The vulnerability analysis will determine the extent of what is to come and with a particular hazard can provide the basis for developing a practical, workable, emergency operations plan or checklist along with appropriate standing operating procedures. A vulnerability analysis (Hazard Identification) should be a matter of record at all levels of government. In analyzing and assessing the vulnerability of individual facilities, you must consider environmental, indigenous, and economic factors. Valuable information from a historical approach on what emergencies happened in the past twenty or thirty years would provide valuable information about potential emergencies that might take place in your area.

For planning purposes, you must assume that most emergencies likely will arrive with very little warning, have a rapid onset, and have a potential for substantial destruction. The likelihood that some of the emergencies mentioned earlier in this paper would ever strike your area may be very small, but you should have the capability to react, cope with, and recover from any emergency situations that could occur at your location.

It is incumbent to provide direction and procedures for the development and implementation of a comprehensive emergency response program. It is essential to design plans of action in the event of an emergency to insure the safety and well being of individuals and property within your area. A disaster (emergency) is a sudden, calamitous event bringing widespread damage or suffering, loss, or destruction, and great misfortune, often arriving without forewarning.

The emergency action plan will provide established procedures and guidelines for management and staff to follow in the event of an emergency. The following emergency plan will assist in the protection of life and property by preparing workers in the facility with a plan of action, reducing the unknown, anticipating potential problems, determining possible solutions to emergency related problems, and establishing recommendations that will improve the readiness of the people in their communities in the event of an emergency.

## **IS OUR COMMUNITY READY FOR AN UNEXPECTED EMERGENCY?**

The question that you may have to answer is - how well prepared are you for an unexpected emergency situation? This is why we must have an action plan ready to ensure that the plan formulated covers the unexpected situations with this being very difficult to identify and predict.

Any community or facility is vulnerable to some extent. Analysis of vulnerability to a particular disaster can provide basis for development of a practical, workable, emergency operations plan or checklist along with appropriate standard operating procedures (SOP). It is necessary to conduct a thorough vulnerability analysis. This is the basis of what might go wrong within your community, and to know how to address the problem of how to implement the emergency response action plan. There has been considerable effort at the federal and state levels to identify hazards such as earthquakes, hurricanes, and other natural emergencies, and especially manmade emergencies since September 11, 2001 and the shooting of 32 students and professors on the Virginia Tech campus. Once you have completed this exercise it is possible to start developing emergency response policies, procedures, and protocols.

Your community must be ready to survive the worst possible emergency. No matter what your business involves, your emergency response plan should be effective and current. The action plan can't be just a manual to inform your workers on what to do or not to do, but must create a greater awareness of the need for readiness in the event of an emergency or catastrophe. A total response management framework of various activities that can be executed in response to an emergency is a key element. This is the reason to develop your plan with a step-by-step training approach with response actions and staff and worker assignments. Is their training appropriate for current and future changes within the community, developing a list of back-ups for employees on sick leave or vacation. Drills should be held at both opportune and inopportune times to cover any situation. During drills everyone in the community must obey the instructions as posted when the alarm is sounded. This leads to the site emergency response plan to minimize devastating property losses and protect jobs and business profits.

## **SITE EMERGENCY RESPONSE PLAN**

There are many possible incidents that may affect the community or enterprise, both from within the boundaries of the organization and from outside. Some of these incidents may be natural, such as severe thunderstorms, tornadoes, floods, and severe winter weather. Many others may be manmade such as flammables, toxins, reactive gases, fire, power failure, explosion, bomb threat, hazardous materials, and terrorist acts mentioned earlier. In order to be properly prepared to handle such conceivable incidents and to keep them in the realm of emergency rather than disaster, a Site Emergency Response Plan (SERP) with the following nine elements are recommended:

- List of emergency numbers for company team members, fire departments, medical rescue services, and police departments.
- Site evacuation routes and procedures, both primary and secondary.

- Location, type, and availability of both site and community emergency equipment.
- A plot plan of designated hazardous materials at or near the location.
- Material safety data sheets on all hazardous materials at or near the location.
- A crisis communication plan for dealing with the media.
- Plan coordination, recommendation, and contacts of site and community officials and emergency responders.
- Training information, including responsibilities of site personnel.
- Testing dates (drills) and procedures, including site exercise results and recommendations.

This includes drills, tests of various program elements and response capabilities, evaluating response procedures, and corrective actions. Alarm tests, simulated drills, and mock exercises with community groups are several testing approaches. Evaluation results and proposed/actual corrective actions must be documented and incorporated into the plan. Involving community agencies in the testing process enhances community relations and improves the plan. It can also lead to improved training opportunities such as mutual aid. Each type of potential emergencies has a different impact. In deciding on whether your enterprise is adequately prepared for the different types of emergencies, it is a good idea to perform a vulnerability analysis of your facility discussed earlier. This will determine the probability and potential impact of the different types of emergencies. One thing that should be checked out is the emergencies of the past.

In Bhopal India, over 2,500 persons died from the methyl isocyanide leak-the worst industrial disaster ever recorded. The Indianapolis Coliseum explosions resulted in 81 deaths and approximately 400 injuries, even though the physical damage was confined to one part of the building in a very large metropolitan area.

Disasters can be subdivided into manmade (technological) and those situations which are usually called "natural disasters" (floods, hurricanes, volcanic eruptions, tornadoes, blizzards, earthquakes, etc.) A technological disaster might be one such as a structural fire, radiological accidents, and explosions. Frequently there is little advance warning in disasters such as these.

Disasters can be divided into phases or periods: A warning period; a threat period; an impact period; an inventory period; a rescue period; a remedy period; and a restoration period. When looking at these phases it is easy to see that the warning period is the most opportune time for providing community information and possible evacuation. Advance warning does not always occur, and thus we must do as much as possible to offset the lack of warning. Disaster planning is an attempt, prior to the actual occurrence of the crisis, to facilitate recognition of emergency demands and to make the community response more effective. It is an exercise in the anticipation of what might be required for any relevant group or organization.

The primary emphasis here will be upon the social disruption caused by the physical effects of the disaster. This is a particularly useful way of examining disasters, since disaster agents create demands with which the community must cope. Such demands are created at the very time when the community's problem solving ability may be severely damaged by the impact of the disaster.

Disaster agents may and do vary along different dimensions. These dimensions and their variants can be combined in a multitude of ways. Thus, it nearly is impossible to develop a meaningful yet simple typology of disaster agents. Nevertheless, knowledge of how disaster agents may differ along one dimension is still useful for emergency planning. Such knowledge should alert the planner to possible variants that have to be taken into account.

Furthermore, some dimensions are more likely than others to be operative and varying in certain localities.

Disaster agents vary in terms of their predictability. An explosion or an earthquake is considerably less foreseeable than a flood, which is brought about by a series of more precisely measurable factors. In fact, for some of weather phenomena, it is possible to obtain, for specific localities, the gross probabilities of a particular disaster agent striking the given area. For example, the chances of hurricane force winds in given Florida cities in any given year can be calculated, with Hurricane Andrew being one of the most disrupted.

A disaster agent can vary in terms of its frequency. Although natural disasters may be relatively rare happenings, there are certain locales, which can be labeled as disaster prone. To illustrate, some regions in the Ohio Valley are more susceptible to flooding, other areas such as in the Midwest are subject to tornadoes, and the Gulf coast is frequently confronted with the threat or occurrence of hurricanes. Thus, there are geographic, climatic, and other conditions which present the possibility of a particular disaster and represent a sustained threat. Here again, gross figures for frequency can be obtained for some disaster agents. The National Weather Service has not only calculated tornado incidences by month (May being the highest), by state (Texas having the most), by square mile (Oklahoma having the highest), but also in terms of threat when high tornado incidence and dense concentration of population is taken into account.

The following factors all deal with time but should not be confused. Disaster agents differ in their speed of onset. For example, impact is sudden in tornadoes and flash floods, while other floods gradually crest. Also, some types of agents, such as earthquakes, may impact an area repetitively in a matter of hours. Length of forewarning is the period between warning and impact. Tidal waves generated by an earthquake illustrate the distinction between the previous two factors. Length of forewarning of tidal waves may be several hours, but their actual speed of onset, once initiated, is very rapid. Disasters also differ in their duration of impact. A tornado impacts an area for only a few minutes, but a flood's impact may be sustained for several days. The worst time combination from the viewpoint of damage potential is a disaster agent that is rapid in onset, gives no warning, and lasts a long time. An earthquake with strong after-shocks is an example of such a threat.

The final differentiating characteristics of disaster agents are their scope of impact and intensity of impact. Scope of impact is essentially a geographic and social space dimension. A disaster can be concentrated in a small area, affecting few people, or dispersed over wide areas, affecting large numbers. Intensity of impact reflects a disaster's potential to inflict injuries, deaths, and property damage. These two factors should be clearly distinguished. For example, an explosion, though highly destructive, may affect only a limited geographic area, whereas a flood may be of low intensity but affect a broad geographic area and many people. This, of course, has important implications for the degree of disruption of local community affairs. A destructive but focalized disaster, though tragic, may have only minimal consequences for the community at large. Conversely, a diffuse but less destructive disaster may be extremely disruptive to everyday community living.

## **TRAINING**

Training is an essential part of most activities within any community. This is especially true when it comes to emergency response and your action plan. Workers should be trained to handle emergency situations within their area. Proper training in emergency response will prove a valuable asset to the company/ community as well as to the employees should the need arise. Such training may include company team members as well as emergency responders from the community. Training for all employees should include:

- power disconnects

- use of fire extinguishers
- search and rescue techniques
- emergency response policies and procedures
- emergency first aid/ medical treatment

## **GEOGRAPHIC INFORMATION SYSTEMS (G.I.S.)**

Another innovative approach designed to increase response preparedness for disasters that recently has been discussed in public health meetings is the geographic information systems. This approach will enhance the preparedness goals and provide a well-trained workforce that can also be relevant in tabletop exercises simulated drills. The G.I.S. applications would especially be of great help in response to large-scale emergency problems such as natural disasters, terrorism, and accidents.

In future workshops and educational programs increased preparedness with G.I.S. training will enhance the various ways we can realize the importance of G.I.S. software relative to our responsibilities in an emergency response program

## **EVACUATION, PLANNING AND PROCEDURES (CREATE A WRITTEN PLAN)**

On site emergency response evacuation planning is a process where the responsibilities of all facility personnel must understand the emergency action plan and general evacuation procedures for their community or location. Once the emergency alarm sounds, every employee needs to know the following evacuation procedures:

- What evacuation route to take - predetermined routes - primary/secondary
- Assemble and check-in point locations where you meet once you get outside
- All facility personnel must assist visitors, members of the public, and sub contractors from the premises. Visitors will remain with staff
- Don't put your work away
- Don't use elevators
- Don't stop to gather your belongings
- Don't stop to inquire if it's a false alarm
- Departmental emergency coordinator or designee will take a roll call-an organized head count
- The emergency coordinator will report the employees who may still be in the building
- Department searchers will check the building for workers who failed to hear the alarm. Searchers will operate in teams
- Each department will stay assembled until further instructions

In the event that immediate assistance of the community resources is not available, you may need to develop additional resources, acquire additional equipment, conduct more training, and establish mutual-aid agreements with close-by enterprises. Other organizations and agencies that might be willing to assist are:

- the office of emergency management
- utility companies
- medical centers and local hospitals
- municipal, county, and state police
- emergency medical services (EMS)
- insurance carriers
- hazardous incident response teams if available

- contractors

Developing a generic plan is a start, but you need a basic emergency response plan to cover special provisions for the most threatening type of emergencies is required by OSHA for all employers.

## **ELEMENTS THAT ALL EMPLOYEES LEARN**

- How to report an emergency
- How to activate and recognize the alarm or warning system
- Check-in and rescue procedures
- Assigned tasks and responsibilities

**CONTINUING ASSESSMENT:** A virtually constant demand in disaster situations is an overall appraisal of what is happening. If no reliable data is available, assessment will be inadequate and confusions will result. Assessment is crucial because of its direct relationship to organized action. Appropriate actions are determined on the basis of perceived needs at any given time or location during disasters.

**MOBILIZATION AND UTILIZATION OF HUMAN AND MATERIAL RESOURCES:** Disasters, just as everyday situations, require the utilization of human and material resources. Personnel must be recruited, trained, and mobilized. Necessary resources must be acquired, maintained, and allocated for appropriate activities. Disaster situations present acute problems in the allocation of crucial human and material resources. Equipment may not be located at points where it is most needed. Specially trained personnel may not be immediately available, and there is no time for training. The location of relevant resources in the community may not be known, hence valuable supplies may go untapped. Given these possible contingencies, the central demand is to effectively utilize all valuable resources. Human and material resources must join together in the most useful way to meet disaster demands.

**COORDINATION:** The need for coordination underlies much of what we have been discussing; it is the essence of good planning. In normal times, overall coordination of the community is generally not critical as various community organizations can carry out their activities in large measure independent of one another. However, during disasters cooperative measures are necessary to allocate the resources of the community so that high priority needs are met. Problems and situations must be assessed and decisions made. Information gaps have to be filled. Resources have to be allocated and distributed. Coordination is therefore the key to planning.

**CONTROL AND AUTHORITY:** Coordination is impossible without some system of overall control and distribution of authority. There must be people who have responsibilities, who are in charge, and whose authority is legitimate. The lack of overall control will simply not suffice in disasters. A general tendency in disaster situations is for new authority patterns to emerge. An individual's authority may be legitimized by his technical competence, his preparation, or his degree of information about the on-going situation. The role of police departments in disaster coordination is a good example.

In any given disaster situation, the characteristics and consequences of the disaster agent are part of the global picture. However, in the planning process it is necessary to break the whole down into parts so that the situation becomes manageable. Attempting to react to the global picture becomes ineffective and inefficient.

Community consensus in the aftermath of such widely publicized disasters as Chernobyl, Bhopal, and Hurricanes Katrina and Rita, indicates the need for advanced planning through an organized community effort. In any given disaster situation, the characteristics and consequences of the disaster agent are all part of the "larger picture."

Successful coping with disaster agents requires thorough preplanning of the anticipated impact of the disaster and the response to victims' needs; such planning requires the combined efforts of legislative leaders, social agencies, and citizens' groups. This is where Federal Emergency Management Agency (FEMA) ensures its disaster preparedness with a comprehensive response program.

Disaster research studies have identified organized planning as the primary means of successfully aiding disaster victims. Through international communication and cooperation, the existing response framework can be investigated and strengthened in a critical review of the state of the art in victim assistance.

## **SIMULATED DRILLS, TESTING AND EVALUATING**

A key to any successful emergency response plan is to hold drills and evaluate the responses of your employees. Practice before an emergency helps prevent panic and confusion. Drills are the ultimate test for determining emergency preparedness. All drills should be planned with an intended goal and to uncover weaknesses in the plan and to make sure everyone follows it. Drills should cover most situations and clearly establish detailed procedures for carrying out complete and partial evacuations from buildings.

Evaluating drills not only provides a strong emergency response, but also lays the foundation for a successful safety program. Evaluation results and proposed/actual corrective actions must be documented and incorporated into the plan. Involving community agencies in the testing process enhances community relations and improves the plan. It can also lead to improve training opportunities.

## **SUMMARY**

The key to controlling an emergency response situation is a well-conceived and developed program. The major elements that should be included in any emergency response preparedness plan are the following:

- communications
- evacuation procedures
- company assessment
- natural emergencies and disasters
- man-made emergencies
- consideration for emergency operations
- emergency/disaster recovery

**ACTION PLANS SHOULD BE DESIGNED TO INSURE THE SAFETY AND WELL-BEING OF INDIVIDUALS AND PROPERTY IN THE EVENT OF AN EMERGENCY OR DISASTER.**

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