

# Chapter 1

## Planning Emergency Preparedness and Response<sup>1</sup>

### Introduction

All drinking water and sewerage systems are subject, to a greater or lesser degree, to hazards. Emergency preparedness is vital even when hurricanes, earthquakes, floods, etc., do not pose a direct threat, since accidents and breaks in pipelines can contaminate water and seriously affect service.

Entities operating and maintaining these systems should have strategies directed at reducing the vulnerability of the systems and providing the best possible response once an emergency arises. The emergency plan should establish the necessary procedures to quickly and effectively mobilize existing resources, and, if necessary, to request outside assistance.

Vulnerability analysis is the basic tool for meeting both objectives. Once the hazards specific to a particular zone are identified, vulnerability analysis assists in determining: (a) the physical shortcomings of system components; (b) weaknesses in the organization and support provided by the water service company; and (c) limitations in terms of quantity, continuity, and quality of service.

Vulnerability analysis applies not only to the physical structure of the system, but also to the organization and management of the water authority or company. For example, in the financing division of the company, the analysis would determine whether there are sufficient funds to carry out mitigation and emergency measures, or whether resources have to be reallocated to ensure that mitigation and emergency plans are viable.

This chapter addresses the process involved in planning the emergency preparedness and response program, indicating its content and the steps, in order of priority, necessary to execute the program and keep it up to date.

### Emergency Preparedness and Response Program

In areas affected by extreme natural phenomena, there is a tendency to believe that these are rare events that will not recur with the same intensity for many years. Actually, the consequences of these phenomena increase in severity, not because they increase in intensity and frequency, but because the at-risk population and infrastructure continue to grow.

The implementation of mitigation measures not only improves the capacity of emergency response, but protects routine operations and makes the systems more reliable. For example, redundant or “back-up” measures designed for emergencies also safeguard routine operations. Likewise, strengthening routine corrective and preventive maintenance of installations favors effective response during emergencies.

---

<sup>1</sup> Additional information on developing an emergency and disaster program can be found in the document *Planificación para atender situaciones de emergencia en sistemas de agua potable y alcantarillado* (PAHO, Cuaderno Técnico no. 37, Washington, D.C., 1993).

The image of the water service company will be improved by acting in a quick and efficient way in an emergency situation. If an emergency program is to become a permanent company program, top company officials must be motivated, vulnerability studies completed, and emergency and mitigation plans carried out.

For the emergency preparedness and response program to be successful, it should be included in the institutional planning process. That is, the program should complement the routine corrective and preventive aspects of operation and maintenance.

To ensure the success of this program, the water service company should: (a) require the broad participation of employees; (b) maintain ongoing promotion and training; (c) carry out simulations and evaluation exercises to test emergency plans; and (d) disseminate information on other incidents (for example, data on damage due to earthquakes presented in Annex 1).

## **Institutionalization and Organization of the Program**

The following aspects should be considered for the institutionalization and organization of the emergency preparedness and response program:

- Legal aspects, including national and institutional standards.
- Institutional organization and coordination, including:
  - Emergency committee
  - Committee for drafting mitigation and emergency plans
  - Emergency operation centers
  - Warning and emergency declarations
- Inter-institutional coordination, including:
  - National emergency commission
  - Other institutions

### **Legal Aspects**

The program should be developed within the existing legal framework of the country and should form part of the national plan. Establishing this from the outset will allow coordination of the plan between the water authority and State institutions, such as civil defense or emergency commissions.

### *National Standards*

Countries have laws, standards, and regulations that establish the institutions responsible for emergency response at the national level, such as civil defense, national emergency agencies, etc. At the local level there are agencies with clearly defined functions and mechanisms for coordination and financing. These standards should be consulted before creating the emergency preparedness program to ensure conformity with regulations, and to ensure that there is adequate support and cooperation between institutional and national plans.

### *Institutional Standards*

Providers of drinking water and sewerage services have their own regulations that define standards of quantity, continuity, and quality of services. Emergency plans will ensure that services are restored to normal conditions as quickly as possible. Disaster conditions pose the greatest risk for public health and may require the use of alternative sources of drinking water and means to dispose of waste water.

The first step that water service companies should take is to support national standards, and to resolve at the highest management level to approve the emergency preparedness and response program. This will give the program the same stature as other institutional programs.

### **Institutional Organization**

The institution providing the services must have an organization that is capable of determining the vulnerability of the systems and their components, implementing mitigation measures, and operating the systems in case of emergencies. It is the responsibility of top management to delegate the development of the program and to approve it. The general director or manager of the company should be a member of the emergency committee.

### *Emergency Committee*

As part of the development of the emergency preparedness and response program, an emergency committee should be established. Company managers should be members of the committee, and will be responsible for coordinating the program's activities. Typically, staff holding the following positions will make up this committee:

- General director or manager of the company
- Supervisors in areas of production, operation, and maintenance service
- Planning director
- Finance director
- Engineering director
- Procurement director
- Public relations director
- Representative of the committee responsible for drafting the emergency plan

The functions and responsibilities of this committee are to:

- Participate in the committee responsible for drafting mitigation and emergency plans;
- Coordinate the drafting, approval, execution, and evaluation of the plans;
- Establish and maintain communication and coordinate activities with the public entities responsible for emergency response at the local or national level;
- Maintain contact with commercial suppliers or providers of equipment, producers of chemicals, and professional associations that can contribute to disaster and emergency response;
- Carry out periodic review and updating of the emergency plan;
- Develop necessary budgets for implementing the plan and present them to the appropriate units;
- Declare internal emergency alerts if an emergency has not been declared by national authorities;
- Provide and supervise ongoing training of personnel in emergency procedures.

At the regional and local levels, emergency committees should also be established and include directors in the areas of administration, production, operation, and maintenance.

### *Drafting Committee for Mitigation and Emergency Response Plans*

This committee is multidisciplinary and usually consists of personnel from different areas of the company. The major responsibility lies in the areas of operations and engineering, but planning, administration, and finance must also be represented.

The functions and responsibilities of the committee are to:

- Develop mitigation and emergency response plans;
- Establish the terms of reference and coordinate specialized vulnerability studies;
- Evaluate the effectiveness of the plan during simulations and in actual situations.

### *Emergency Operations Center*

Once the emergency committee is installed, a center or various centers should be established where the committee and key personnel can meet during emergency simulations, the warning period, and actual emergencies. Typically, regular office space is allocated for this function, but the emergency plan should specify at least one alternate site that can be used if the first is inoperable. The emergency operations center should have the following characteristics:

- Minimal vulnerability to the most common hazards in the area
- Quick access routes
- Location within the drinking water and sewerage service area
- Reliable communication facilities, including telephones, fax, radio transmitter and receiver, television, and radios with commercial, civil band, and ham radio frequencies
- Back-up power system
- 24-hour security
- Detailed plans of all systems and copies of the emergency plan and of pertinent documentation
- Adequate equipment and furnishings for meetings and office work
- Transportation and computer equipment
- Safe
- Registry of activities
- One-week supply (at a minimum) of equipment and food.

### *Warnings and Emergency Declarations*

Warnings and emergency declarations activate the emergency plan both at the onset and conclusion of an emergency.

The national emergency committees provide warnings or declare emergency situations at the national or regional level. These declarations should be sufficient to activate the emergency plan of the water service company. However, the company's emergency committee should have the ability to declare emergencies in the case of damage or failure in the system, such as temporary loss of intakes, accidents that affect the service, drought, etc. These declarations are of special importance since they activate all the procedures established in the plan, including those involving the use of funds.

### **Inter-Institutional Coordination**

Coordination among institutions is basic to emergency and disaster response. Without such coordination chaos will result, impacting the users of the service and the ability to carry out rehabilitation.

### *National Emergency Committee*

The water company's emergency plan should be developed in coordination with the national plan. In most cases, the leading institution (civil defense, national emergency committee) collaborates in the development of the sectoral plan and can provide resources and channel technical assistance for required studies and analysis.

### *Other Service Institutions*

The water company's emergency plan should consider necessary coordination with other public service companies such as energy, communications, police, firefighters, etc. Agreements and mutual assistance among institutions facilitate efficient response. It is important to have detailed knowledge of the human resources, material, and equipment available at the local level.

## **Vulnerability Analysis**

This is carried out in accordance with directives presented in this document.

## **Mitigation Plan**

The outcome of the vulnerability analysis will be the mitigation plan, which comprises improvement and structural retrofitting measures directed toward increasing the reliability of system components and of the system as a whole.

The mitigation plan will prioritize the activities to be carried out and will specify those responsible for executing the plan, a timeframe for completion, and estimated costs. The plan should also consider the need to adapt selected buildings to function as emergency operations centers.

## **Emergency Response Plan**

Once the vulnerability analysis has been carried out, the emergency plan should be drafted. The plan will include the procedures, instructions, and necessary information for preparing, mobilizing, and using the company's resources in the most effective way in case of emergency.

The plan should be designed to respond to emergencies and disasters with the resources that are currently available within the company, assuming that an emergency could occur at any moment. In other words, it should not be an ideal, but a realistic plan. With time, as mitigation measures are carried out and equipment is obtained for emergencies, the plan will be modified.

The plan should be kept up to date and be available at any time for use by persons involved in emergency response. Its success will depend on how simple and practical it is to carry out, as well as on the knowledge of the persons involved, obtained through periodical training and simulation exercises.

At a minimum, the plan should comprise the following:

1. Objective: hazards to which plan is directed
2. Geographic area of application
3. Relationship to the national emergency plan (that of the national emergency commission or civil defense agency)
4. Organization: central, regional, and local emergency committees, and those responsible for drafting the plan (functions and responsibilities)
5. Description and operation of the system (document with sketches)
6. Emergency operations centers
7. Warning and emergency declarations
8. Personnel plan (training); key personnel and their addresses
9. Security plan
10. Transportation plan

11. Communications
12. Supply plan
13. Emergency supply warehouse/stores
14. Institutional coordination
15. Coordination with private companies and suppliers
16. Response to neighboring supply systems operated by other companies
17. Damage assessment
18. Priorities for water supply
19. Alternative sources of water supply and disposal measures for waste water
20. Information for the press and public
21. Procedures for operation in emergency situations
22. Procedures for inspection following an emergency
23. Use of water tank trucks, portable tanks, and other means of transporting drinking water
24. Management of funds for:
  - Emergency committee
  - Drafting, evaluation, and control committee for emergency plan
  - Emergency operations centers
  - Warning and emergency declarations
25. Necessary budgets for implementation of the plan, including:
  - System plans
  - Operation plans
  - Results of first phase of vulnerability analysis
26. Training of clients in the correct use of water in emergency situations
27. Management of information during the emergency

If companies manage several cities or have regional operations, it is convenient for each city and region to have it's own plan, with the plans integrated at the central level.