Box 2. Declaration of State of Alert and State of Emergency Employed by a Latin American Water Supply and Sewerage Company in Response to Heavy Rainfall

HEAVY RAINFALL

Each area deputy manager's office must obtain and analyze meteorological forecast information that makes it possible to identify the likely or potential effects of unusually heavy precipitation levels. It should also produce a report indicating the likely damage scenario and the works needed to mitigate it. The report should be submitted to the Engineering and Planning Manager's Office. For the winter season, forecasts should be submitted by 30 April. Estimates of water volume resulting from snow thaw should be submitted before 1 December.

Declaration of a State of Alert

Based on the forecasts contained in these reports, the Engineering and Planning Manager will declare a state of alert for any given water supply or sewerage system, or all of them. Measures will also be taken to reduce the impact of extreme precipitation by carrying out some or all of the works contemplated in the Plan.

Declaration of a State of Emergency

To the extent that the system components are damaged due to floods, power outages, blocked roads, or major leaks, the production and network supervisors must inform the Engineering and Planning Manager, who, based on the information received, may convene the Emergency Committee. At the meeting, the decision may be taken to declare a state of emergency and to take all the measures planned for such a situation, such as contracting personnel and services, or the acquisition of required materials.

The state of emergency is that which follows the actual impact of the disaster or emergency. It should be declared when the event is imminent or, in the case of sudden catastrophes, as soon as it has occurred.

The declaration of the state of emergency requires that the members of the Central Emergency Committee meet immediately, and activate all legal, administrative, logistical and operational measures stipulated in the various procedures and protocols agreed upon beforehand.

Table 4. Hydrometeorological hazard alert system –CNE

ALERT	DESCRIPTION	ACTIONS	RESPONSIBLE INSTITUTIONS
GREEN	Inform	Inform CNE's Chairman and Board of Directors, Regional Emergency Committees (CREs), Local Emergency Committees (CLEs), other institutions and the media	National Meteorological Institute Risk Management Directorate
YELLOW	Prepare for: Indirect Effects	Inform CNE's Chairman and Board of Directors Activate CREs and CLEs Manage public information Verify supplies at central level, CRE level, CLE level Contact suppliers Arrange transportation Convene situation room personnel Activate additional resources of the Information and Analysis Center (CIA) and the Emergency Information System (SIE) Mobilize CNE personnel, based on priorities, to headquarters and the affected area Establish communication points for CLEs	National Meteorological Institute Risk Management Directorate Executive Directorate
	Direct Effects	Inform CNE's Chairman and Board of Directors Activate the Public Emergency Information System (SIPE)/ SIE Prepare supplies Activate security and traffic procedures Open temporary shelters Declare Emergency Operations Center (COE) in permanent session Mobilize CNE personnel to the affected area	
RED	Evacuate Indirect Effects	SIPE activated CIA activated CREs and CLEs proceed to carry out preventive evacuation of high-risk areas Temporary shelters open Resources mobilized Damage and needs assessment	National Meteorological Institute Risk Management Directorate Executive Directorate Board of Directors President of the Republic
	Direct Effects	Massive evacuation SIPE, COE, SIE, CIA activated Security operations underway Temporary shelters open Resources mobilized Damage and needs assessment Rehabilitation of lifelines and key infrastructure	

Emergency Operations Plans

The purpose of Emergency Operations Plans is to foresee, in as much detail as possible, all activities that must be carried out by each of the company departments and employees immediately after a disaster has struck in order to rehabilitate water supply and sewerage systems in the shortest time possible and provide the affected population with clean, safe water. Box 3 outlines basic principles of these plans.

Emergency Operations Plans, which, as already noted, form part of the Emergency and Disaster Prevention and Response Program, play an administrative role in the technical and operational area, since they specify which actions each employee must carry out. Having such plans is critical when the effects of a disaster or major emergency could lead to widespread confusion or when, as a result of the emergency, not all required personnel are available.

Bearing in mind the various components of the company and the existing units for system operation and maintenance, Emergency Operations Plans must be tailored to specific hazards prevalent in the area. Thus, the unit in charge of water diversion and treatment (production) should have Emergency Operations Plans for earthquakes, volcanic eruptions, drought, floods and other potential hazards in its area of coverage. The same is true of the units in charge of maintaining the electromechanical equipment, drinking water distribution networks, waste water collection systems, and so on.

These Emergency Operations Plans have two well-defined features: the first, the type of hazard it is meant to respond to; the second, the type of work that needs to be carried out to rehabilitate those components that have been compromised as a result of a disaster.

For instance, if a landslide has affected the drinking water supply by causing leaks in the distribution network, two kinds of action must be taken: one involving operations, the other involving maintenance. In order to prevent loss of water through leaks in sections damaged by the landslide, the company's operational personnel must take specific actions such as closing check valves to cut off the water supply to the affected areas while ensuring that most of the customers in other areas continue to receive services. Meanwhile, the maintenance staff must carry out a prompt inspection and repair the affected sectors in order to rehabilitate the system in the shortest time possible. Necessary security measures are necessary to protect the staff members involved in the repairs.

Given the two main features discussed above, the design of the Emergency Operations Plan should include pre-disaster actions, including possible simulations.

The plans must contain clear and precise instructions for responding to each

of the situations that may arise in a given emergency, based on the vulnerability studies. Each of the hazards analyzed must have its own set of instructions, contained in individual manuals.

One such manual, for example, may cover the actions should an earthquake affect a given component, such as shutting the exit valves of storage tanks. The manual would describe which tanks should be shut down, by name and location, which valves must be shut, and what their number and location is. If necessary, a map or diagram should be included to help with the location of the valves.

Box 3. Basic principles of the Emergency Operations Plan

- The Emergency Operations Plan should not be a plan to develop a plan. It must be the plan itself.
- The Plan should not be an organizational guidance project that merely lists functions and responsibilities. It must describe the objectives and methods for using resources to achieve these objectives.
- The Plan must specify who will do what, where, and when, based on the existing resources and organizational structure.
- The Plan must be dynamic. It should be updated whenever there is a change in resources, personnel training, or the vulnerability of the system.
- The Plan must be clear, concise, and complete. Emergency operations should not be described in excessive detail. Rather, the Plan should be a guide to action that specifies certain key details.
- The Plan must be designed with the participation of those employees of the various operational areas who have hands-on experience and knowledge of the system. Such staff might include operators of treatment plants and pumping stations, water quality technicians, network maintenance staff, and other operational control personnel.
- The Plan must be widely disseminated and known by the staff.
- The Plan must be complemented with instructions on the most relevant actions in case of an adverse event.

The Development of an Emergency Operations Plan

- The main attribute of an Emergency Operations Plan is that it provides the mechanisms needed to facilitate effective and swift decision-making.
- The Plan should include objectives, strategies, and actions required to confront emergency situations.

- The Plan is activated immediately after the declaration of a state of alert or emergency, as the case may be.

To illustrate the three points highlighted above, consider the impacts of a flood that reduces the quality of the water supply. Assuming that the objective of the company is to provide drinking water, the correct strategy would be to suspend the inflow of water of poor quality into the storage tanks. Measures would be taken to ration the water already in the tanks so that there is enough at least for basic human consumption until the quality of the incoming water makes it possible to return to normal distribution.

This procedure, which is part of the company's decision-making process and takes into account technical criteria and existing restrictions, must be presented in the Emergency Operations Plan in a clear, precise manner.

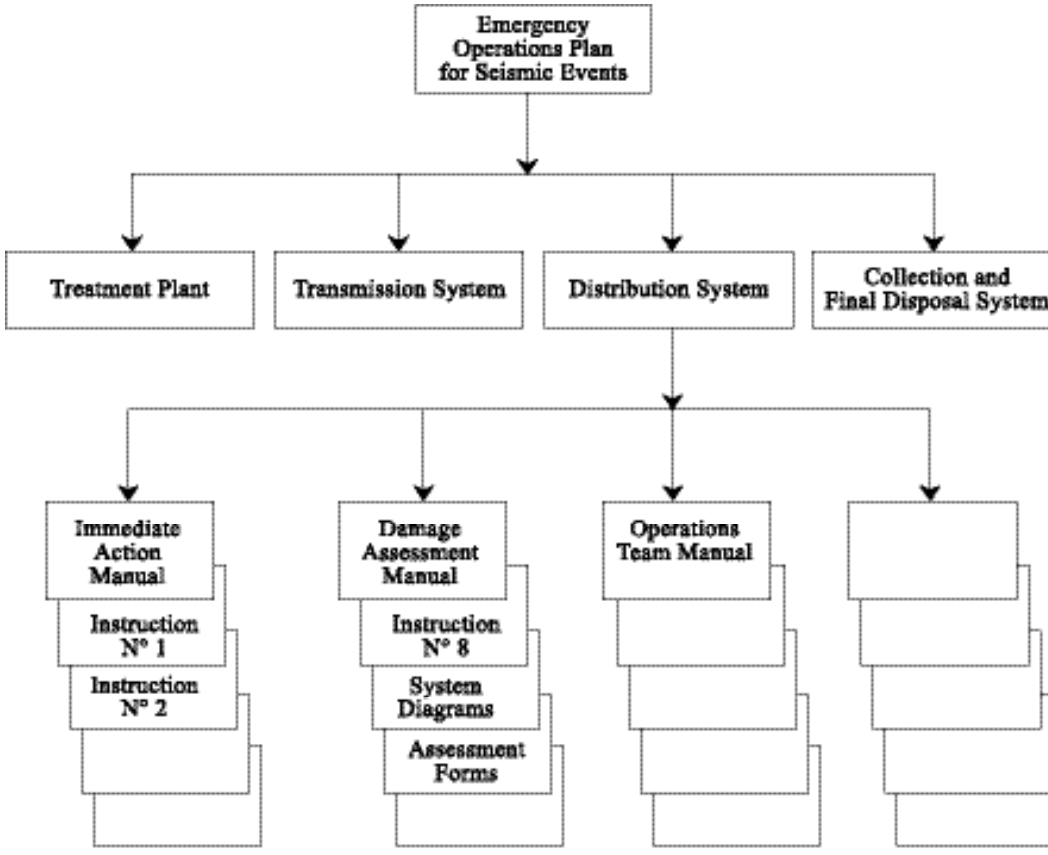
When the time comes to design the Emergency Operations Plan, a key input will be the technical procedures manual for the operation and maintenance of the company's drinking water and sewerage systems. If such a manual is not available, the task of developing an Emergency Operations Plan will be a great deal more difficult.

Instructions for Emergency and Disaster Situations

The Emergency Operations Plan contains a series of instructions that each staff member or company unit must carry out in the face of a potential adverse event, including the assessment of the current condition of the company's systems. It presupposes the participation of employees with a great deal of knowledge and experience in the management of the systems.

Table 5 shows the structure of the Emergency Operations Plan. Two examples of instructions in the event of an earthquake follow (Tables 6 and 7).

Table 5. Structure of the Emergency Operations Plan in the Event of an Earthquake.[8]



[8] Pan American Health Organization, *Planificación para atender situaciones de emergencia en sistemas de agua potable y alcantarillado. Cuaderno Técnico N°37* (Washington, D.C.: PAHO ,1993).

Table 6. Activation of the Emergency Operations Committee—Operating Instructions[9]

Purpose: Activation of the Emergency Operations Committee	
Event:	Earthquake
Action:	Immediate actions
Activity:	Activation of the Emergency Operations Committee
Responsible unit:	Emergency Operations Committee

During Working Hours:

Activate the Emergency Operations Committee and all its regular or alternate members, who should gather in the situation room.

The members of the Emergency Operations Committee comprise the following officials:

- Highest technical and operational authority;
- Representatives from production, operational control, engineering and electromechanical maintenance, administration, and logistics.

An up-to-date list of all members, their positions, addresses and telephone numbers should be available.

Should some of the members be away from the workplace, they must get in touch with the situation room and indicate their location and possibility of returning to the workplace.

Outside of Working Hours:

Should there be an official in charge at the time of the earthquake, he or she must remain in the situation room and take charge of all immediate actions needed until a higher-level member of the Committee arrives.

The other Committee members must arrive as quickly as possible at the situation room. In the event of any delay, they must call the situation room as soon as possible.

General Considerations

Once all or some of the Emergency Operations Committee members have gathered in the situation room, they will assume full command over all emergency operations and proceed to carry out Instruction 2: Organization of the Emergency Response Teams.

Moreover, the Chair of the Emergency Operations Committee, or whoever is acting as his or her substitute, should contact the Central Emergency Committee and establish ongoing communications as indicated in Instruction 4, Communications.

Situation Room

Complete address, telephone numbers, radio frequency and code.

[9] Ibid.

Table 7. Instructions for Convening Emergency Response Teams – Operating Instructions

Purpose: Activation of the Emergency Response Teams

Event:	Earthquake
Action:	Immediate actions
Activity:	Activate the Emergency Response Teams, allocate resources and working areas
In command:	Head of Operations and Maintenance (Name)

Guidelines:
The activation of the Emergency Response Teams occurs much as in a normal situation, except for the Damage Assessment and Quality Control Teams, which must comprise staff specifically trained for these purposes.

1. The basic teams that will act within the jurisdiction of the distribution unit in charge of the system will be the following:
   - Damage Assessment Team (name of the team, members, and shifts);
   - Operations and Distribution Team (name of the team, members, and shifts);
   - Water Quality Control Team (name of the team, members, and shifts).

If the jurisdiction is large and ordinary operations and maintenance tasks have been divided into sectors, this arrangement should continue as long as the existing and available resources allow it. These sectors apply to the Distribution and Rehabilitation Teams. Damage Assessment and Quality Control Teams will act according to their own program functions, which are outlined in the corresponding instruction manual.

2. Next, the boundaries and the zones or units that make up the sectors must be described. These sectors must be represented on the Emergency Operations Committee.

3. The structure of the Emergency Response Teams must be described succinctly, based on the activities each is meant to carry out, taking into account the following:
   - Activity to be carried out;
   - Minimum staff required;
   - Tools for carrying out the activities (including the relevant manuals, which will guide the teams' actions).

The following are some aspects that must be taken into account when preparing the emergency instructions of some of the key departments of the company involved in emergency and disaster response, as well as other aspects that must be a part of the Emergency Operations Plans.

• *Finance*

The finance department must carry out several activities in preparation for emergency situations, and others following the impact of a disaster.

Before the disaster or emergency, normal procedures must be reviewed so that, while guaranteeing their correct use, available funds can be mobilized quickly and effectively for the procurement of supplies and payment for services during the emergency. For example, if there is rule that all acquisitions above a certain amount require three different quotes from suppliers, it should be stipulated that in an emergency situation supplies or services can be purchased directly. In short, it is advisable to have a protocol regarding the declaration of states of alert or emergency that can activate financial procedures for exceptional cases.

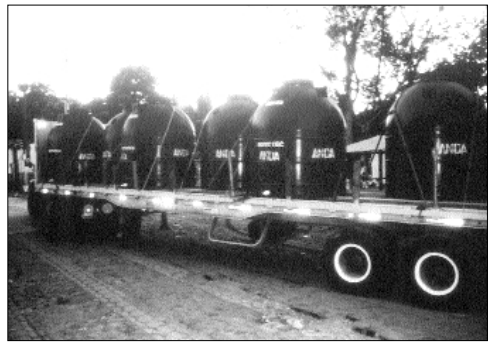
Immediately after the event, it is important to make the necessary resources available for procurement, feeding the staff, contracting equipment and machinery, etc., while carefully monitoring the use of the funds.

Depending on the location of the emergency and the prevailing conditions, it may be necessary for financial staff to travel to the affected areas in order to provide support in the application of budgetary controls and other functions.

• *Supplies and Services*

In the supplies and services area, there should be early identification of resources (both internal and external to the firm) that may be needed in an emergency situation, such as staff, equipment, or machinery. In emergencies, outsourcing and acquisitions must be expedited, as well as the loan of materials and resources by other companies. A common example is the need for water trucks, which may be loaned by another water supply company or hired from private firms such as breweries or dairies, preferably having negotiated in advance the fees that will be charged.

As in the case of the financial unit, it is necessary for units responsible for procuring supplies and services to review standard procedures in view of current vulnerabilities and the potential impact of emergencies and disasters on the system, so that the actions required during an emergency can be carried out with maximum efficiency.



A truck is adapted to distribute water tanks because of a shortage of water trucks in El Salvador.

R. Saenz El Salvador, 2001

Units responsible for procuring supplies and services should provide support to the operational area by establishing agreements or contracts with private companies that can provide the necessary services, such as construction companies or engineering consultants. An updated list of suppliers and contracts or agreements signed specifically for emergency response will help expedite solutions to the many problems caused by an emergency.

Similarly, an inventory of available in-house and external vehicles and machinery must be completed so that in a crisis situation they can quickly be mobilized.

It is advisable for the Emergency Operations Plan to include measures to be taken should an emergency arise outside the normal staff working hours so that resources in storage areas and at other sites can be mobilized promptly.

• *Communications*

Communications are crucial in emergency and disaster situations. It is advisable to deal separately with internal and external communications. In both cases, it is important to define the communication flows and priority levels of communication to discourage interference and imprecise, inaccurate communications.

Damage to a water company's storage facility in Tegucigalpa, Honduras, following Hurricane Mitch.

SANAA -Honduras, 1998

As noted in the section on the establishment of the Emergency Operations Committee, it is advisable for an official from the public relations department of the company or agency to be a member, so as to assist in all matters related to the communications strategy, including internal messages and contacts with the mass media.

Internal Communications

The company's internal communications respond to various needs. Hence it is necessary to identify the proper communication channels and select the most opportune times to disseminate the required information.

As the Emergency Operations Plan is developed, along with the vulnerability analyses and prevention and mitigation programs, pertinent information about these activities should be provided to the staff. It is useful to employ the communication mechanisms already in place within the company, such as newsletters, technical publications, internal memos, meetings of heads of departments, and staff meetings of the various departments or plants.

Once the Emergency Operations Plan is available, it must be made widely known to all the staff, including evacuation plans and recommendations from the occupational health unit (regarding risks of accidents, vaccination needs, etc.). The resources of the training unit can play a role in these dissemination activities.

The Emergency Operations Plan must include all the information that may be required in an emergency, such as a list of key officials, their addresses, telephone numbers, and so on, since they will have to be contacted urgently and informed of the state of alert. During the impact, in addition to the predefined procedures for internal and external communications, the situation room must be able to gather all the information needed for decision-making.

External Communications

With external communications, as with internal communications, the target audiences must be clearly identified. These will include the company's suppliers, government authorities, other companies providing the same or similar services (e.g., other utilities), the media, users of the services, and the general public.

Depending on the situation, after a disaster has struck it may be necessary to report which locations will have access to the company's services, on what days and at what time. To disseminate these messages, a variety of channels and techniques may be used, such as mass media (radio, television, newspapers), megaphone vans, religious services, or community message boards.

The public relations representative is the official who, in coordination with the chair of the Central Emergency Committee and members of the company's directorate, will issue statements to the press, so that the information provided is accurate. Authorized and well-informed spokespeople, supported by the inputs of technicians and specialists, are crucial to ensuring that the information provided is clear and effective.

In such situations, radio, television, and print media are among the best ways to disseminate information, whether through paid announcements or press conferences.

It may happen that a disaster does not affect the water supply and sewerage systems. However, the company or agency is not isolated from its environment, and damages to other companies or sectors, such as power utilities or the road system, may in turn affect the operations of the water supply and sewerage systems. Open communications with other entities is therefore essential.

• *Coordination Between Sectors*

In a disaster, the degree to which the water supply and sewerage company or agency can coordinate its efforts with other sectors is crucial, both before and in the aftermath of the event. It is highly advisable for such coordination to be structured in advance, since this will greatly facilitate matters in a state of alert or emergency.

Coordination procedures may be within the sector or between different sectors. In the former case, they apply to suppliers, subcontractors, other companies providing sanitation services, and communities. Coordination with other sectors implies activities targeting the ministries of health, of public works and transportation, of energy and the environment, as well as civil defense and national emergency commissions, the armed forces, the police, municipal governments, hospitals, organized community groups, and other key institutions.

For coordination to be effective, a work plan must be in place. The first step is to identify the likely needs of the water supply and sewerage company or agency, as well as the needs of other facilities dependent on water supply and sewerage systems, such as hospitals, shelters, or firefighter units. Exchange of information among these entities is needed. For instance, the power utility should guarantee that it will assign a high priority to the power lines that feed pumping stations and treatment plants. Similarly, drinking water distribution areas must be identified and prioritized, so that hospitals, health centers, shelters and prisons are guaranteed an adequate supply of water.

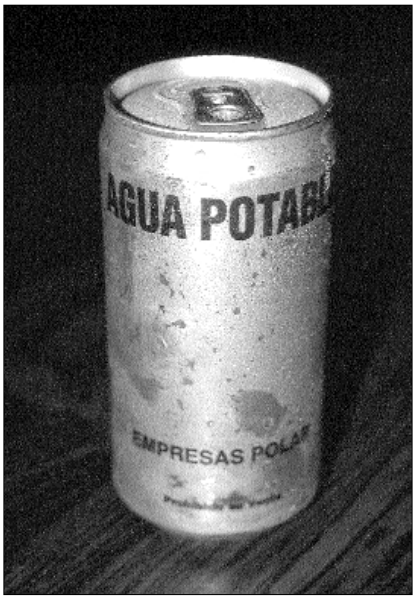
Finally, the procedures for carrying out coordination activities must be agreed upon, preferably in protocols regarding each likely scenario. One of the aspects to bear in mind is land-use management, since water supply and sewerage systems must often service highly vulnerable areas.

• *Community Participation*

Community participation within the Emergency Operations Plan involves several aspects, including:

- Community cooperation in response activities and rehabilitation of the water supply and sewerage services, given their own interest in these services, particularly in the case of rural water supply and sewerage systems;
- The role of the community through its representatives in municipal governments and civil society organizations;
- The organization of the community for the distribution of drinking water during the emergency.

The community, as the primary users of water supply and sewerage systems, must also be involved in training efforts and be adequately informed of what to do when emergencies and disasters disrupt normal services.



A private company cooperated in the distribution of drinking water following devastating landslides in Venezuela in 1999.

C. Osorio, 1999

During an emergency, it is frequently necessary to rely on the help of members of the community, whether individually or as part of an organization. For instance, they can help locate new water sources, manage some of the water distribution points, or distribute chlorine for disinfection of drinking water.

Each region has its own characteristics. It is therefore wise to analyze the local culture and incorporate, in the development of the emergency plans, the most active community groups. Just as agreements can be reached in advance with the private sector, agreements should be made with community groups. The community should be trained so that its organizations can contribute to prevention and response efforts.