2

THE EMERGENCY PLANNING PROCESS

Mandates, Structure, and Guidelines

Starting Point

Go to www.wiley.com/college/Perry to assess your knowledge of the emergency planning process.
Determine where you need to concentrate your effort.

What You'll Learn in This Chapter

- The process used to develop a government emergency plan
- The elements of the private sector emergency planning process
- The professional standards and rules governing emergency planning
- The steps to conduct hazard/vulnerability analyses
- The principles that guide the process of emergency planning

After Studying This Chapter, You'll Be Able To

- Assemble and motivate a planning team
- Organize private and nonprofit agencies into the planning process
- Formulate specific government and professional mandates in the planning process
- Manage the planning process and ensure it is comprehensive
- Analyze the connection of planning to operations through the IMS, EOC, and consultation

Goals and Outcomes

- Assess the link between emergency planning process with community preparedness
- Assess a review of an emergency plan
- Assemble vulnerability and resource information into a definition of response needs
- Evaluate agent-generated and response-generated demands for the planning process
- Design the milestones for government- and business-planning processes

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INTRODUCTION

Emergency planning is the critical path to community preparedness. It is a process achieved through consultation, equipping, training, exercises, and critiques. Emergency planning practices vary among communities. Some jurisdictions conduct a formal process, assigning specific tasks to a Local Emergency Management Agency (LEMA). In other communities, planning is done informally. In these settings, assigned tasks can be loosely defined, and a limited budget may be dispersed among many agencies within the jurisdiction.

The products of planning may be written or unwritten. The nature of the planning process often depends on the size of the community. Big communities, which have many governmental offices, resources, and personnel, tend to have formalized processes. They rely more on written documentation and agreements. In smaller communities, the planning process may have few written products. They may rely on informal relationships. Formalization of the planning process also differs with the frequency of hazard impact. In communities that face the same threats often, emergency response may be a practiced skill. Thus, in a town subject to seasonal floods, citizens may be routinely warned and evacuated by fire and police. Their actions may not require documentation. Their knowledge and skills may be part of agency standard operating procedures (SOP). Skills may be passed on to newer responders in training or simply by responding to events. Because it happens often, responsibilities are known and practiced.

We advocate having a formal planning process even for small communities. There is value to formalization because it:

- Explicitly defines vulnerability and how it is to be monitored.
- Stabilizes response strategies and tactics.
- Defines responsibilities of internal and external agencies.
- Increases the likelihood that backup safety systems are developed.
- Decreases the likelihood of system breakdowns due to forgetting.
- Ensures important training and exercise functions will be implemented.
- Increases the probability of a successful emergency response.

A formal process helps to ensure a continuing planning process. It also enhances compliance with administrative rules and statutory demands for emergency planning and plans (OSHA requirements, the Clean Air Act, and SARA Title III). Written documentation provides a record of a jurisdiction's planning progress. This information may be used in court.

Professional associations and government set standards for formal planning processes. The top among these are the National Fire Protection Association (NFPA) and the Department of Homeland Security (DHS). The NFPA supports Standard 1600. "Recommended Practice for Disaster/Emergency Management and Business

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Continuity Programs." NFPA standards are reviewed and revised on a 5-year cycle. The Federal Emergency Management Agency, International Association of Emergency Managers, and the National Emergency Management Association participated in creating the standard. This standard covers private sector business programs. **NFPA 1600** sets criteria for creating and operating successful emergency management programs. The standard can be used to assess and improve existing programs. It can be used to create new programs. NFPA defines 11 program elements that look at mitigation, preparedness, response, and recovery.

NFPA 1600 emphasizes vulnerability analysis and mitigation. Programs should contain an element for hazard identification. Risk assessment should address a wide range of hazards. It defines nine elements of vulnerability analysis. The analysis should include likely impacts on the health and safety of the public. It should also cover responders, infrastructure, and continuity of operations. The environment, economic viability, and regulatory and contractual obligations are also examined. A mitigation strategy is required. This strategy must consider building codes, land use practices, retrofitting structures, and other mitigation tactics.

The standard addresses the need for current inventories of internal and external resources. LEMAs are encouraged to make mutual aid agreements. Programs are directed to establish and evaluate performance goals. The vulnerability analysis is outlined to include personnel, equipment, and facilities needed for each threat. These resources should be calculated in terms of quantity required, response times, and capabilities. NFPA 1600 also requires program elements that address the planning protocol and plan content. It delineates emergency management roles and tasks. NFPA 1600 assumes that a formal planning process supports the emergency management program.

This standard is important to you for several reasons. First, it was issued from a respected and established authority. Professionals in government and industry recognize the NFPA standard. Second, NFPA 1600 can be used to evaluate programs. The standard is a model for self-assessment and for use by external evaluators. Finally, NFPA 1600 can serve as a basis for planning. It can help create an emergency management program. It can also enhance an existing program. Government has limited resources. When emergency managers defend budgets or seek funds, NFPA 1600 compliance serves as a solid basis for claims.

The **National Incident Management System** (NIMS) is a government-issued guideline for emergency planning. All federal agencies must adopt NIMS. All state and local organizations must adopt NIMS as a condition for federal preparedness funding. NIMS addresses disaster response capabilities in the context of emergency planning. There are six components to NIMS:

- *Command and management* addresses the traditional part of Incident Command Systems (ICSs).
- *Preparedness* addresses the conduct of planning, training, exercises, equipment acquisition, and certification standards.

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- *Resource management* creates a "resource-typing system" and sets rules for managing resources.
- *Communication and information management* sets standards for communications.
- *Supporting technologies for emergency response* addresses acquisition of new technology.
- *Ongoing management and maintenance* requires plan review and strategic assessments.

The planning community has serious doubts about NIMS. The NIMS was devised by using a top-down approach. Everything is centrally coordinated by DHS. Views differ on the scope and intent in developing NIMS (Hess and Gerard, 2004). The detail in which NIMS specifies resources, protocols, and processes concern municipal agencies. More important is the question of whether such detailed specification promotes or retards the effective management of disasters. During Hurricane Katrina's 2005 assault on New Orleans, many federal agencies, as well as state and local agencies, were unable to successfully implement NIMS (Walker, 2006).

There is no doubt DHS has the legal authority to require adoption of NIMS. However, implementation is quite a different matter. NIMS adoption and the reality of an executable capability at the local level are by no means the same. There are many practical challenges for both DHS and local agencies. For DHS to produce standards, they require many resources. For example, they must annually test and certify every command officer in the United States. DHS has created a **NIMS Integration Center** (www.fema.gov/nims) to oversee the implementation of NIMS, to issue NIMS standards, to test and certify NIMS skills, and to monitor system development. The Federal Emergency Management Agency (FEMA) Emergency Management Institute offers on-line classes on NIMS and basic ICS. Unfortunately, computer system limitations have plagued these efforts. DHS has violated many established guidelines for planning processes. Nonetheless, making federal funding contingent on NIMS adoption exerts powerful pressure on local governments.

2.1 Planning Practice

Many people believe that written plans define preparedness, but it is important to avoid equating a plan with preparedness. Planning should be a continuing process. The plan itself represents a picture of that process at a specific point in time. A written plan does not guarantee the presence of hazard/vulnerability analyses, ongoing monitoring, personnel training, and system exercising that really define preparedness. Preparedness is a dynamic state. The planning process drives continual monitoring of the threat environment and technology. A written plan is an important part of community emergency preparedness. Being ready results from a process in which a community looks at its full range of weaknesses. Vulnerability,

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resources, and organizational structures can change over time. Performance skills may disappear when not trained and exercised. These actions maintain preparedness. The planning process is the only path to community preparedness.

Emergency planning is driven by two goals: hazard assessment and risk reduction. Hazard assessment involves documenting known threats and finding new threats. Hazard assessment help can come from intergovernmental partnerships. Federal agencies operate formal programs to share complex information with state and local jurisdictions. As we move from the federal to the municipal level, the availability of technology and expert resources generally decrease. By contrast, as one moves down the intergovernmental structure, knowledge of local risks and resources increases. The assessment of risks includes a technical study of the scale of the impacts on a community's safety, health, property, and social and economic activity. It also includes information about the likelihood of events. For example, FEMA flood maps show how flooding recurs in an area ("100-year flood"). However, the availability and accuracy of data are different between hazard types (see Figure 2-1).

Risk reduction analysis is the specification of the actions necessary to decrease the known or projected levels of danger. It also identifies needed resources for effective action. Because no one has enough resources to eliminate all risks, this process defines the level of acceptable risk. **Acceptable risk** is the

Figure 2-1

FEMA maintains a mapping capability available to emergency planners who create visual representations of community vulnerability.

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amount of risk exposure that individuals, organizations, or jurisdictions deem appropriate to tolerate. Local powers define the level of acceptable risk. It can vary between jurisdictions. Addressing a risk depends on the presence of technology and the amount of resources that are marshaled. Hazard assessment measures, monitors, and evaluates risks. Risk reduction balances the consequences of risk with the state of technology and the resources that can be devoted to abatement.

The practice of planning varies among governments and organizations. It is a fact of the profession. Like any other human activity, planning depends on those engaging in that activity. It is the resources available from state and national governments that level the playing field. These governments provide resources for planning that all local governments or private organizations can use. We are concerned with the planning practices of public and private organizations. Because emergency planning processes, authorities, and motivations differ between these types of organizations, each is addressed separately here.

2.1.1 Planning for Public Jurisdictions

The structure of the planning process can vary widely, yet many approaches can adequately address all the key issues in a timely manner. Most jurisdictions already have an emergency operations plan (EOP), or perhaps they have a set of plans for a few hazards. And many have set up an authority for such planning, usually a LEMA. Thus, you rarely start a process or a written plan from scratch. That's an advantage. Most often, emergency planners use the planning process to review an existing EOP. An effective planning process has seven milestones.

1. Assemble the planning group or team.
2. Examine hazard vulnerability.
3. Establish task assignments.
4. Conduct resource analysis.
5. Define roles and responsibilities under the plan.
6. Ensure the management structure is adequate.
7. Revise or prepare the written plan.

The first milestone is to make a planning group. Even in LEMAs, the planning team should be gathered in terms of anticipated agent-generated and response-generated demands. For any given threat, create a matrix (Table 2-1) that compares agent-generated with response-generated demands. By completing the matrix, you not only identify who should be part of the planning team but also what resources are needed.

The table names a threat agent and lists demands on the emergency response system. By examining "Who is responsible," you identify departments that should

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Table 2-1: Example Planning Table for Selected Agent- and Response-Generated Demands

Agent: Local River Flood Demands	What is the disaster demand?	Who is responsible?	How will the demand be met?
Warning Delivery	Warn residents.	Police dept	Mobile loudspeakers
Preimpact Preparations: Support for Evacuating Immobile, Infirm, Institutionalized Populations	Ensure ability to comply with evacuation movement.	Police dept, fire dept, transit dept, public works	Busses for those without transport, teams for non-ambulatory, institutionalized.
Search and Rescue	Find stranded, dead.	Fire dept, NGO teams	S&R team deployment
Care of the Injured	Medical/ behavioral health care.	Fire dept, EMS, Fire dept or NGO mental health teams.	Scene triage and treatment, shelter treatment; transport to hospitals.
Welfare	Shelter and feeding.	Red Cross, Salvation Army.	Standard Operating Procedures.
Restore Basic Services	Restore electricity, gas, clear debris.	Public works department, utility companies	Standard Operating Procedures.
Protection Against Secondary Impacts	Monitor data on flood crest, duration. Assess public health issues.	LEMA. Public health department	Standard Operating Procedures.
Community Order	Enforce law, protect property.	Police dept	Standard Operating Procedures.
Communications	Connect EOC with responders.	LEMA	Standard Operating Procedures.

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Table 2-1: *(continued)*

Damage Assessment	Accumulating impact data.	EOC	Reports from on-scene personnel
Mobilization	Initiate public warning, initiate response.	EOC	Standard Operating Procedures.
Control and Authority	Manage the response.	EOC IMS	Standard Operating Procedures.

Adapted from: Dynes, R., Quarantelli, E. L., and Kreps, G. (1972) *A Perspective on Disaster Planning.* Newark, DE: University of Delaware Disaster Research Center, page 43.

be represented on the planning team. Answering "What is the disaster demand?" helps you to define what must be accomplished, how and by whom.

Defining vulnerability in communities with established plans begins with study of the most recent hazard/vulnerability assessment (H/VA). You look for changes in the aspects of identified threats. You also look for new threats. This process must also include study of the changes in the community that may increase or decrease vulnerability. Has a new levee system been constructed? Is the existing levee system weakening with age? Has the population grown? Are new developments built in hazard-prone areas? Stockton and Sacramento, California, are partly protected from flood inundation by an old levee system built when the populations were much smaller. The hurricane-caused collapse of the New Orleans levees led California authorities to carefully monitor their levees in the 2006 rainy season. Has the population changed in a way that affects response-generated demands? For example, communities in the Southwest have a Hispanic population with different cultural traditions. David Alexander (2003: 98) found that an H/VA should address five features:

1. Physical characteristics of the threat:
   - Seasonality, probability, speed of onset, duration of impact, identification of exposed areas, and issues associated with multiple impacts.
2. Predictability of the threat:
   - The state of prediction and detection technology, and length of forewarning.
3. Controllability of the threat:
   - Are structural mitigations available and implemented? Can the force of impact be channeled into places or forms that are less dangerous?

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4. Sociocultural factors related to the threat:
   - What is the level of citizen awareness? Has the population significantly changed in size or composition or distribution? Is population density increasing? Has the ethnic or cultural character of the area changed, which might produce cultural norms counter to normal emergency response or possibly language/communication difficulties?
5. Ecological factors related to the threat:
   - Is the impact of the focal agent likely to create other disasters? Floods cause public health dangers, whereas earthquakes cause hazardous materials releases. What is the likelihood that the threat or its secondary features will produce harm to the environment (water table contamination, soil contamination, dangers to wildlife)? What kinds of measures will be required to restore or protect a contaminated environment?

The third planning process milestone makes task assignments. The tasks arise from addressing agent- and response-generated demands. The tasks also depend on the threat issues. For example, one agent-generated demand is population warning. The vulnerability analysis shows that the Spanish-speaking groups have increased in the past year. Then, warning messages will also have to be in Spanish, and if the number of homes in danger areas has rapidly increased, the plan for evacuation must be changed to minimize evacuation times. A successful task assignment process accomplishes five activities:

▲ Tasks must be assigned comprehensively, specifically to individuals or teams.
▲ A time frame must be established for completion.
▲ Modifications to needed training for response personnel must be identified.
▲ Exercises must be scheduled to test effectiveness.
▲ Each change must be incorporated into the revised EOP.

The fourth milestone is performing a resource analysis. This task is guided by the analysis of agent- and response-generated demands. It must record each resource required to meet demands. The vulnerability assessment characterizes the nature of the threat, and resource analysis identifies whether special training, equipment, or personnel are required. For example, citizens exposed to toxic chemicals might need to be cleansed (decontaminated), which would require cleaning solutions, water sources, privacy provision if possible, and dry clothing and foot protection. **Resource analysis** is the pairing of resources with estimated emergency response needs and planning for the acquisition and use of those resources. It is accomplished by answering six questions:

▲ What is the strategy to abate the problem?
▲ What specific tasks are required to implement the strategy?

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- What specific resources are required to implement each task?
- What resources are currently available to implement each task?
- Who controls or is responsible for the resources that are available?
- How can these resources be integrated into the response strategy?

Be sensitive to any gaps between required and available resources. You must address these in the planning process. In some cases, the required resource will have to be found. The Occupational Safety and Health Administration (OSHA) requires that firefighters use specific clothing and breathing protection. When there are no laws to be met, a gap may be filled in many ways if it is deemed cost-effective or necessary. Sometimes private organizations or nearby jurisdictions (mutual aid agreements) provide needed resources.

The fifth planning milestone is definition of the roles of the public and private agencies in the emergency response. Role definition can be built around specific tasks or by organization. Tasks are defined by specific agent- and response-generated demands of each threat. Tasks cross organizations, so a single group may do many tasks based on the scope of its services. As a rule, this approach yields a large matrix of functions. It also locates the subunits of organizations that do the functions. Another way to assign tasks and roles is by organization. You list the tasks the organization performs during an emergency response. Then managers of each organization assign tasks internally and set up means to ensure the job gets done. For example, a fire department may be assigned the handling of hazardous materials and technical rescues in addition to their other regular duties.

The sixth planning milestone specifies the command structure that guides the emergency response. The particular type of incident command system (IMS) used is explicitly defined in the EOP. This structure defines the authority and reporting relationships among the organizations engaged in the response. For most jurisdictions, the management structure for large or complex incidents is embodied in the emergency operations center (EOC). Smaller incidents use an IMS under an incident commander. The EOC and IMS identify and allocate resources during planning for response. At the same time, this command structure serves as points of contact for all participating organizations during nonemergency times. It is in this context that knowledge of strategies, tactics, and tasks are shared. Here too is where role conflicts between agencies are ironed out. With respect to field operations, the incident management systems provide command and control.

The last planning milestone is to document the planning process. This is done in the EOP and written agreements regarding organizational obligations. This works for both organizations within a government jurisdiction (city departments) and external agencies (a county or state public health department). Recall that the production of the EOP is *not* the end of the planning process. The EOP is simply a picture of the parties' agreements at one point in time. The planning process continues with H/VA, demographic monitoring of the community, and

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monitoring of new technology. At least once each year, the planners revisit the EOP to ensure it remains effective, efficient, and current.

2.1.2 Planning for Industry

Industrial and business accidents also impose specific agent-generated and response-generated demands. Thus, private sector emergency preparedness (EP) coordinators need to develop emergency programs. Industrial facilities are subject to different mandates and rules than governments. They often follow a different planning process. EP coordinators must sometimes call on their communities for technical assistance for planning and response. At other times, they must warn surrounding communities of off-site impacts. Facility EP coordinators participate with government managers in communitywide emergency response planning, training, and exercising.

Developing an Emergency Preparedness Program

A capability for prompt and effective emergency response is based on the quality of the facility's EP program. Such programs need firm support from organizational managers. The responsibility for a facility EP is usually assigned to the Manager for Health, Safety, and Environment (HSE). The EP Coordinator must know the duties of his position. Specifically, to whom does the EP Coordinator report? Who reports to him? What duties must be accomplished?

Once basic expectations are known, EP Coordinators develop program plans for their efforts over the course of each year. FEMA also advises local government managers to set annual goals. The EP Coordinator uses organizational capability analyses to assign tasks to organization units with the right resources. There is little guidance on performing organizational capability analyses. The best method is to contact subject matter experts (SMEs). **SMEs** are people who cultivate special knowledge of hazard agents, hazard processes, human behavior relative to hazards, or any of the processes or analyses that support any phase of emergency management.

SMEs help define specific tasks for performing emergency functions tied to events (e.g., fire, explosion, or toxic chemical release). For each task, they list the personnel, facilities, equipment, and materials needed. You should be careful when asking SMEs about doing tasks under conditions they have not experienced. Firefighters, for example, might think their experience with small-scale fires and chemical spills will generalize to large-scale incidents. As a rule, larger events are not simply multiples of smaller events. Thus, when the risk analysis singles out disaster conditions that might be very different from prior experiences, the EP Coordinator should seek outside experts.

This assessment may spot suitable levels of capability in some areas but not in others. The EP Coordinator documents the capability shortfall and devises a plan to reduce it. Sometimes corrections will require more than 1 year. Planning is often a low priority for most industrial and business organizations, so limited

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funds are available at any particular time. EP Coordinators often use a 5-year plan for new resources. This plan will set specific annual goals so that the program moves steadily toward the ultimate goal.

Coordinating with Facility Departments and External Organizations

A facility EP Coordinator uses a planning process to develop an EP program, but the coordinator cannot do it alone. Emergency planning is the duty of the facility's operational departments. The EP Coordinator must use and train the staff from operational departments. In addition, the EP Coordinator should work with the local fire department, LEMA, and Local Emergency Planning Committee (LEPC). Working with the local fire department is essential to ensure off-site support and equipment. The structure of the on-site and off-site emergency response organizations must match. Working with the LEMA and LEPC also achieves an overall appraisal of the area at risk, the special facilities and populations that could be affected by incidents, and the ability of community agencies to provide the emergency response resources.

Conducting Hazard/Vulnerability/Risk Analyses

Internal (accident or sabotage) or external (geophysical, meteorological, or hydrological events, or terrorist attacks) causes can produce events involving fires, explosions, or chemical releases. The types of hazards, their initiating events, their consequences, and their likelihoods of occurrence are assessed by using hazard analysis. This process begins with a **substance inventory** that identifies dangerous substances or processes. The threat locations and the quantities of substances at those locations are also identified. A substance inventory is used to assess the threats posed to the facility and its workers. It is also used to assess threats to its neighbors and the environment. Extremely Hazardous Substances (EHSs), defined under SARA Title III, have special requirements for defining Vulnerable Zones (VZs). A **vulnerable zone** is a geographic area within which people, structures, and the environment (agriculture, husbandry, soil, water, etc.) are subject to harm. VZs can be computed by using data on the chemical's toxicity, its quantity available for release, the type of spill (liquid or gaseous), the postulated release duration (e.g., 10 minutes), assumed meteorological conditions (wind speed and atmospheric stability), and terrain (urban or rural). Methods include manual computations or software-based or -assisted calculations such as *ALOHA* [see *CAMEO* at www.epa.gov/ceppo/cameo], and *RMP*Comp* (at www.yosemite.epa.gov/oswer/ceppoweb.nsf/content/rmp-comp.htm.)]. Figure 2-2 shows a rectangular VZ surrounding the transportation route to a facility and the facility itself. The VZ should be examined to identify areas of residential, commercial, and industrial land use. Be careful to identify the locations of special facilities that have limited ability to receive warnings or to take protective action. These facilities include schools, nursing homes, jails, recreation facilities, hospitals, and the like. In many cases, these facilities will have developed their own emergency plans with which private or public sector emergency planners can work.

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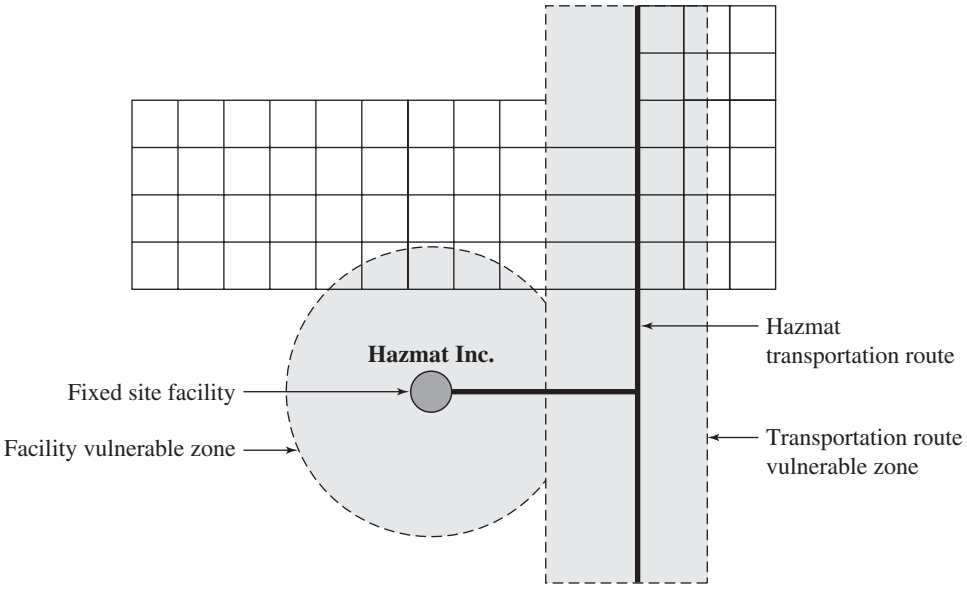
Figure 2-2



Vulnerable zones around fixed-site facility and transportation route.

Conducting Emergency Assessment Analyses

Once a vulnerability analysis has been completed, the planner's attention turns to four generic emergency response functions. These are shown in Table 2-2. The emergency response functions of emergency assessment, hazard operations (expedient hazard mitigation), personnel and population protection, and incident management are performed by using on-site and off-site actions.

Conducting Emergency Assessment Analyses

The facility's emergency response team must promptly and accurately assess the nature and magnitude of an emergency. These assessments include safely obtaining information about the product and container and monitoring environmental conditions. Conditions can affect the direction and extent of any fires, explosions, or product releases to air, water, or soil. Data from the survey should be integrated into an emergency classification system. A common type of classification system involves four levels:

- *Level I*: Threat to a single building
- *Level II*: Site-wide threat
- *Level III*: Minor off-site threat
- *Level IV*: Major off-site threat

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Table 2-2: Generic Emergency Response Functions Addressed by the Planning Process

Response Function	*On-Site Actions*	*Off-Site Actions*
Emergency assessment	Threat detection, reconnaissance, and emergency classification Product monitoring Container monitoring Environmental monitoring Release monitoring Impact projection Damage assessment	Incident monitoring Environmental monitoring Population monitoring Impact projection Damage assessment
Hazard operations	Leak control (patching, plugging, overpacking, crimping, product shutoff/transfer/ displacement) Spill control (air ventilation, dissolution, dispersion, diversion; water damming, diverting, booming, absorption, diking, retention, adsorption, neutralization; surface blanketing) Fire control (extinguishment, controlled burn, exposure protection, withdrawal) Container stabilization	
Personnel and population protection	Impact ("hot/warm/cold") zone access control and security Personal protective equipment Medical monitoring	Protective action selection (evacuation, sheltering in-place) Population warning Protective action implementation

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Response Function	*On-Site Actions*	*Off-Site Actions*
	Hazard exposure control Search and rescue Decontamination First aid and transport of victims Emergency medical care and morgues	(transportation support, traffic management) Evacuation zone access control and security Search and rescue Reception and care of victims Emergency medical care and morgues Evacuation zone re-entry
Incident management	Agency notification and mobilization Mobilization of facilities and equipment Internal direction and control External coordination Public information Administrative and logistical support Documentation (incident data collection and after-action analysis) Incident recovery (resource assessment and replacement) Demobilization	Agency notification and mobilization Mobilization of facilities and equipment Internal direction and control External coordination Public information Administrative and logistical support Documentation (incident data collection and after-action analysis) Incident recovery (resource assessment and replacement) Demobilization

The facility's response team must be able to communicate the classification of an event. This allows *off-site* emergency response organizations to anticipate providing technical assistance to the facility. They may also need to undertake population protective actions. An emergency classification system using the information from the hazard/vulnerability/risk analysis is constructed by overlaying the radius of the VZ onto a facility site map. A chemical whose VZ is entirely within a single building produces only a Level I incident.

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An **emergency damage assessment** gauges the immediate consequences of impact, projects the prospect for short-term further damage, estimates the chance of further primary impacts, and identifies likely secondary threat consequences. These features can increase the initial damages and require further emergency response, which includes reviewing potential impacts of fires or hazardous releases at off-site locations. These damage assessments should be relayed to off-site agencies. The EP Coordinator ensures that there are resources to support an emergency assessment.

Conducting Operations: Expedient Hazard Mitigation

The facility's emergency response team must be prepared to prevent fires, explosions, or hazardous releases. The severity of such events is limited by the emergency response system. If severe events do occur, they must be terminated as soon as possible. Table 2-2 shows four principal methods of expedient hazard mitigation—leak control, spill control, fire control, and container stabilization. **Leak control** limits the rate at which chemical products escape from containment to the environment. In turn, there are two types of leak controls. Direct controls restore the integrity of a compromised container by patching, plugging, overpacking, or crimping. Indirect controls include product shutoff, product transfer, and product displacement.

Spill control limits the rate at which a chemical disperses through the environment. Gaseous releases can be controlled by ventilation, dissolution, dispersion, and diversion. Liquid releases to ground can be controlled by diking, retention, adsorption, and neutralization. Liquid releases to water can be controlled by damming, diverting, booming, and absorption. Solid releases to ground can be controlled by blanketing. By contrast, **fire control** involves extinguishment, exposure (adjacent structures) protection, and controlled burn. Finally, **container stabilization** restores an unstable container to a stable physical location or orientation. Container stabilization is principally used in transportation incidents. The EP Coordinator must ensure the resources to support expedient hazard mitigation.

Conducting Personnel and Population Protection Analyses

All response organizations perform multiple protection tasks. On-site actions protect members of the on-site emergency response organization. Off-site actions focus on protective actions for the population at risk. On-site protection requires the use of personal protective equipment (PPE). Facility EP Coordinators know that major incidents require protective action by local residents and special facility populations. Facility personnel may need to warn off-site populations at the same time they notify local officials of an emergency. Thus, EP Coordinators must know measures for off-site population protection.

Many protective actions involve a choice between evacuation and sheltering in place. Getting everyone at risk to leave an area seems simple. A rapid evacuation is easy to achieve when the risk area population is small and safe areas are close. However, it can take many hours to clear the risk area if the population is large and the evacuation route system is substantial. Urbanik (2000) reports evacuation

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time estimates for some urban areas around commercial nuclear power plants require more than 30 hours. Sheltering in place is the most common protective action recommendation for some hazards (e.g., tornadoes), but choosing between evacuation and sheltering in place can be complex for chemical emergencies.

The risk area population must be warned about the hazard. There are seven primary warning mechanisms. These include face-to-face warnings, mobile loudspeakers, sirens, commercial radio and television, tone alert radio, newspapers, and telephones. Each mechanism differs in the way it might work in the community. EP Coordinators consult with local emergency managers to select the best mechanism. The choice is based on the aspects of the jurisdiction (e.g., population density and wealth). It also depends on threat speed of onset, scope, and the amount of forewarning.

Conducting Incident Management Analyses

Incident management involves similar tasks for on-site and off-site emergency organizations. Incident management copes with the response-generated demands of the emergency. It is important to set apart internal direction and control from external coordination. It is also important to understand that population warnings spread crucial information to those at risk. In contrast, public information is directed toward those who are *not* at risk. As with other response functions, the EP Coordinator must ensure that there are resources to support incident management.

2.1.3 Developing Plans and Procedures

Industry groups give technical guidance for the development of facility emergency response plans. For example, the Chemical Manufacturers Association *CAER Program Handbook* defines 10 standards for a response plan:

1. Assignment of organizational responsibilities
2. Risk evaluation
3. Notification procedures and communication systems
4. Emergency equipment and facilities
5. Assessment capabilities
6. Protective action procedures
7. Public education and information
8. Post emergency procedures
9. Training and drills, and
10. Program maintenance

These standards are similar to the NFPA 1600 guidelines. The *CAER Program Handbook* also complements federal government guidance for local government agencies.

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An industrial facility emergency plan should also consider the issue of command and control. An IMS should be adopted by private organizations as universal command structure for emergency response. This structure is under the authority of a single Incident Commander (IC). The IC can be supported by a Unified Command, which consists of members from other response organizations (e.g., local fire department). The IC directs an emergency response organization consisting of five sections. Command consists of the IC and the Information, Safety, and Liaison functions. The Operations Section is in charge of tactical operations. It operates a staging area for mobilizing personnel. It comprises divisions and functional groups (assigned to specific tasks such as leak control, evacuation management, and emergency medical services) or combinations of units in Task Forces and Strike Teams. The Planning Section has a Resources Unit, Situation Unit, Demobilization Unit, and Documentation Unit. The Logistics Section has a Service Branch and a Support Branch. The Service Branch contains a Communications Unit, a Medical Unit, and a Food Unit, whereas the Support Branch contains a Supply Unit, a Facilities Unit, and a Ground Support Unit. Finally, there is a Finance and Administration Section that has a Time Unit, a Procurement Unit, a Compensation and Claims Unit, and a Cost Unit. Facility EP Coordinators should design their emergency response organizations to link with the version of IMS used by local government agencies to ensure that on-site and off-site organizations work well together.

2.1.4 Establishing Emergency Operations Centers

EOCs provide technical assistance and direct resources to emergency responders. EOCs are located in known safe areas. EOC personnel can quickly locate resources that are spread out across the organization (or elsewhere off-site) and direct them to the IC. EOCs distribute information and resources to the different organizations and governments involved in the response. This capability requires flexible and extensive telecommunications and information-processing equipment in the EOC.

2.1.5 Conducting and Evaluating Training, Drills, and Exercises

Training upgrades response capabilities, so the facility emergency response plan should describe the training required for all response personnel. Teaching should address each person's assigned tasks. Training also reviews procedures and duties of each person. To promote flexibility, everyone should know about the hazard. They should know how to protect themselves and the overview of the emergency response plan and its rationale. Cross-training allows people who perform one function to fill in or support other functions if the need arises.

Training must be evaluated by drills, exercises, and occasional responses to actual events. Drills usually involve the performance of one person or a small team over a period of minutes to hours. Exercises involve larger organizations and multiorganizational networks over a period of hours to days.

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FOR EXAMPLE

Northridge Earthquake Hazardous Material Spills

The 1994 Northridge earthquake killed 57 people. It injured more than 9000. It caused moderate or severe damage to more than 12,000 structures. The total cost was more than $20 billion. At the same time, there were hundreds of earthquake-initiated hazardous materials releases. These came from train derailment and petroleum and natural gas pipe ruptures. Many involved releases of hazardous chemicals used in hospitals and industrial firms. The local government had planned for earthquakes. Jurisdictions also had plans for responding to hazardous materials accidents. The challenge was that the plans did not assume that the two events took place at the same time. Because each type of incident involves very different response demands, more personnel, using overlapping equipment, were called into the response. Progress was significantly slowed by the oversight that earthquakes can induce simultaneous hazardous materials accidents. Two effective planning processes, operating independently, can produce ineffective plans.

SELF-CHECK

- What are the principal benefits of a formalized emergency planning process?
- How can practicing emergency planners use NPFA 1600 in their job?
- What milestones must be accomplished by an effective emergency planning process?
- Define **leak control** and identify the mechanisms for achieving it.

2.2 Guidelines for the Emergency Planning Process

A highly formal planning process does not necessarily guarantee community or business emergency preparedness. The planning process is defined in terms of milestones to be accomplished. The *way* the process is implemented and the *environment* in which it is conducted also influence the level of preparedness that is produced. The consequences of the approach to accomplishing milestones and the impact of the environment can be captured in planning guidelines or principles. Quarantelli (1982) used 10 such principles, as did Alexander (2003) and

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Lindell and Perry (1992), whereas Rockett (1994) proposed 19. Here we are concerned with eight features of the planning process that commonly arise and should be explicitly addressed to improve community preparedness:

1. Emergency planners should anticipate both active and passive resistance to the planning process and develop strategies to manage these obstacles.
2. Preimpact planning should address all hazards to which the community is exposed.
3. Preimpact planning should elicit participation, commitment, and clearly defined agreement among all response organizations.
4. Preimpact planning should be based on accurate assumptions about the threat, typical human behavior in disasters, and likely support from external sources such as state and federal agencies.
5. EOPs should identify the types of emergency response actions that are most likely to be appropriate but encourage improvisation based on continuing emergency assessment.
6. Emergency planning should address the linkage of emergency response to disaster recovery and hazard mitigation.
7. Preimpact planning should provide for training and evaluating the emergency response organization at all levels—individual, team, department, and community.
8. Emergency planning should be recognized as a continuing process.

These eight principles are based in the research literature but were found by observing what happens in local emergency planning processes. Being aware of these principles keeps the planner from being surprised by things that are really expected. Observing the guidelines increases the chances that EOPs will be effective and efficient.

2.2.1 Managing Resistance to the Planning Process

Emergency planning may face apathy by some and resistance from others (McEntire, 2003; Quarantelli, 1982). Apathy persists because most people—especially elected officials—don't like to think about disasters. A common objection to planning is that it takes resources. Federal and state laws mandating planning are not enough to stop resistance. Thus, planning activities need support from the jurisdiction's Chief Administrative Officer, an issue champion (also known as a *policy entrepreneur*), or a disaster-planning committee that can mobilize support (Prater and Lindell, 2000). Even acceptance of the need for emergency planning does not stop conflict. Organizations seek to preserve their autonomy, security, and prestige. So they resist activities that threaten these goals. Planning involves the allocation of power and resources (especially personnel and budget), so every unit within an organization wants its role recognized and a budget for that role.

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2.2.2 Adopt an All-Hazards Approach

The planning process should combine plans for each hazard. You should identify the types of environmental extremes (e.g., hurricanes and earthquakes), technological accidents (e.g., nuclear power plant accidents), and deliberate incidents (e.g., sabotage or terrorist attack). You then determine which hazard agents make similar demands on the emergency response organization. When two hazard agents have similar aspects, it is likely they will require a common pattern of response. Similar functions provide multiple-use opportunities for personnel, procedures, facilities, and equipment. Common or generic functions simplify training. In addition, it enhances reliability of performance during emergencies. Only when hazard agents require distinctly different responses will hazard-specific appendixes in the emergency plan be required.

2.2.3 Promote Multiorganizational Participation

Good emergency planning promotes interorganizational coordination by finding ways to get managers and employees to actively commit to emergency response goals and responsibilities. There needs to be a clear agreement among all response organizations regarding responsibilities, priorities, and resources. This includes public safety agencies and organizations that may be hazard sources (e.g., nuclear power plants or chemical facilities). Schools, hospitals, and nursing homes are also involved. Each group has different capabilities, so they must work in concert to perform four functions: emergency assessment, hazard operations, population protection, and incident management. Each group must be aware of other organizational operations and limitations. This supports the distribution of resources to the different functional areas of the emergency response.

2.2.4 Rely on Accurate Assumptions

Emergency planning must be based on accurate knowledge of threats, consequences, and ways to manage them. Accurate knowledge results from access to or conduct of systematic analyses. Thus, you must identify hazards that affect your community and determine which areas are at risk. You must know the facilities and population segments in those risk areas and what can be done to reduce or eliminate vulnerability. Emergency managers need to grasp the basic aspects of these hazards such as speed of onset, scope, and duration of impact.

When it comes to identifying hazards, planners and public officials recognize the limits of their expertise. They recognize that they lack accurate knowledge about the behavior of a geophysical (earthquake and volcano), meteorological (tornado and hurricane), or technological (hazardous materials) hazards. They see the need for contacting an expert. The same cannot usually be said about human behavior in a disaster. As a familiar saying goes, the problem is not so much that people don't know what is true, but that what they do "know" is false. Many studies describe **disaster myths,** incorrect beliefs about the way citizens

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behave under disaster conditions. These myths persist despite research showing otherwise. For example, disaster victims typically act rationally. They do not flee in panic. They do not wander aimlessly in shock, nor do they comply docilely with orders of authorities. Instead, victims are likely to make their own decisions. Following impact, they are the first to search for survivors. They care for the injured, and they help protect property from further damage. When they need help, victims are more likely to contact informal sources such as friends, relatives, and local groups. Moreover, looting in evacuated areas is rare. Crime rates tend to *decline* after disaster impact.

These disaster myths are not minor matters. They hamper emergency planning by influencing the allocation of resources. They also affect the flow of information. For example, officials sometimes cite expectations of panic as a justification for giving the public incomplete or no information. This kind of response is counterproductive. People are more reluctant to comply with suggested measures when they have vague or incomplete warning messages. Thus, the misconception that accurate information will cause panic can frustrate attempts to protect the public. For these reasons, the planning process must be firmly grounded in science literature.

All emergency plans must be based on accurate assumptions about aid from external sources. In major disasters, hospitals might be damaged or overloaded.

Figure 2-3

Citizens can be expected to help themselves in the absence of official response. These Hurricane Katrina survivors welcome USAR members to their rooftop makeshift shelter.

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Destruction of transportation systems could prevent outside assistance from arriving for days. Restoration of disrupted systems could take much longer. Thus, all social units must be prepared to be self-reliant for an extended period of time. FEMA's *National Response Plan* warns local jurisdictions not to expect federal resources to arrive until at least 72 hours after a disaster impact. The Comptroller General of the United States (Walker, 2006) studied the federal response to Hurricanes Katrina and Rita and reported that DHS failed to adequately execute the Federal Response Plan for weeks.

2.2.5 Identify Appropriate Actions While Encouraging Improvisation

Effective emergency planning should identify the response actions most likely to be appropriate in an emergency. However, it should also encourage improvisation based on continuing assessment of the emergency by response personnel. Careful planning can promote faster emergency response. Rapid response is important but not the only goal of emergency planning. In fact, the appropriateness of response is as important as the speed of response. Continuous and accurate emergency assessment ensures that the response is appropriate and that response actions are anticipated before they need to be accomplished. In the high-pressure decision atmosphere accompanying an imminent threat, it is difficult for an emergency manager to appear to be "doing nothing." However, the best action might be to actively monitor the situation for further information rather than start unnecessary or possibly wrong protective actions. Good planning prepares both responders and officials to understand this principle as a means of avoiding inappropriate criticism.

The EOP should emphasize flexibility so that responders can improvise as the situation demands. The planning process should focus on *principles* of response. It should not have overly specific procedures with too many details. Trying to create detailed emergency plans produces four undesirable outcomes:

- Gaps exist because it is simply impossible to anticipate all contingencies.
- Very specific details tend to get out of date very quickly.
- Too many details produce confused priorities.
- Greater detail produces a bulky and complex plan.

Plans that fail to acknowledge these principles are to train and exercise. A large, complicated plan makes it hard for responders to understand their roles in the overall emergency response. Finally, bulky plans often sit on shelves instead of being a useful map for community preparedness.

2.2.6 Link Emergency Response to Disaster Recovery and Hazard Mitigation

No clear line separates emergency response and disaster recovery. Some portions of the community will be engaged in emergency response tasks while others conduct

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recovery tasks. Response planning should be linked to recovery planning, which will speed the process of disaster recovery. It will also ease the integration of hazard mitigation into disaster recovery (Wu and Lindell, 2004). The necessary coordination can be achieved through organizational contacts between officials and personnel responsible for these activities.

2.2.7 Training and Evaluation

Disaster planning requires training and evaluation. The training process explains the plan to the people who will be involved in the emergency response. Everyone in response roles must be trained to perform their duties. This includes fire, police, emergency medical services personnel, public works employees, and others. There also should be training for personnel in hospitals, schools, nursing homes, and other facilities. Finally, the population at risk must be involved in the planning process. They need to be aware that planning for community threats is underway. They need to know what is expected of them under those plans and what is likely to happen in a disaster. They also need to understand what emergency organizations can and cannot do for them.

Proposed emergency response operations need to be tested globally. Emergency drills and exercises simulate an impact environment for testing operational procedures. They test knowledge retained from training. Drills and exercises also enhance the ways that different organizational personnel work together. They help members to better communicate, to become conversant with each other's SOPs, and to appreciate their joint role in response. Furthermore, multifunctional exercises constitute a simultaneous and comprehensive test of emergency plans and procedures. They also test personnel training, equipment, and materials. Finally, multifunctional exercises produce publicity for the emergency response organizations, which increases their credibility.

2.2.8 Adopt a Continuous Planning Process

The final principle for effective emergency planning is that it should be a continuing process. Changes in the threat environment, technology, and the community require that an emergency planning process detect and respond to these changes. This point is often overlooked. There is a tendency to view disaster planning as a product (the plan), not a process. This misconception confuses tangible products with the activities that produce them. Effective planning is made up of pieces that are difficult to document on paper. These include the development of emergency responders' knowledge about resources available from governmental and private organizations, the acquisition of knowledge about emergency demands and other agencies' capabilities, and the establishment of collaborative relationships across organizational boundaries. By treating written plans as final products, one risks creating an illusion of being prepared for an

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FOR EXAMPLE

Mt. St. Helens Volcanic Eruption

When Mt. St. Helens violently erupted on May 18, 1980, the magnitude of the event was not anticipated. However, there had been distinct signs for weeks that volcanic activity had resumed. A restricted entry zone was established, which excluded citizens from nearby towns. This is because authorities thought an eruption was imminent but the technology for prediction did not afford much lead time. Despite the obvious threat, there was much pressure on the governor to rescind the restrictions to allow businesses to reopen and homeowners to return. There was special resistance in the town of Toutle where the economy depended on logging and tourism. When the eruption took place, the town was devastated by ash fall and mudflows down the adjacent Toutle River. If the restrictions had been lifted, much of the population would have been killed or injured.

emergency. As time passes, many changes take place. For example, reorganization may have changed the agencies responsible for emergency response. The potential for changes in hazard exposure, population vulnerability, and resources of emergency response organizations dictates that emergency plans and procedures be reviewed often, preferably annually.

SELF-CHECK

- Why is there resistance to emergency planning?
- What are **disaster myths** and why are they a problem?
- Why is developing a very detailed disaster plan more a problem than an asset?
- Why are emergency drills and exercises important in the planning process?

SUMMARY

Emergency planning is the process that defines how well a community can coexist with hazards. Only with well-crafted plans that have input from a variety of actors will you be able to reduce the potential loss of life and structural damage.

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In this chapter, you learned how to assemble a planning team. You learned the steps in the planning process for both governments and private sector organizations. You also discovered how to ensure the planning process is comprehensive. You can now lead a review of an emergency plan. You can translate a vulnerability analysis into a definition of response needs. You can also identify agent- and response-generated demands for the planning process. You have learned what reactions to expect to the planning process, as well as specific guidelines for successfully accomplishing the milestones. These skills will serve you well in your career and they will also serve your community well.

KEY TERMS

Acceptable Risk	The amount of risk exposure that individuals, organizations, or jurisdictions deem appropriate to tolerate.
Container Stabilization	Restores an unstable container to a stable physical location or orientation.
Disaster Myths	Incorrect beliefs about the way citizens behave under disaster conditions.
Emergency Damage Assessment	Measures the immediate consequences of impact, projects the prospect for short-term further damage, estimates the chance of further primary impacts, and identifies likely secondary threat consequences.
Fire Control	Organizes extinguishment, exposure (adjacent structures) protection, and controlled burn.
Leak Control	Limits the rate at which chemical products escape from containment to the environment.
National Incident Management System (NIMS)	A government-issued guideline for emergency planning and incident management.
NIMS Integration Center	Organization that oversees the implementation of NIMS, issues NIMS standards, tests and certifies NIMS skills, and monitors system development.
NFPA 1600	Professional association standard that sets criteria for creating and operating successful emergency management programs. NFPA is an acronym for the National Fire Protection Association.
Resource Analysis	The pairing of resources with estimated emergency response needs and planning for the acquisition and use of those resources.

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Risk Reduction Analysis	The analysis of the actions necessary to decrease known or projected levels of danger associated with a threat.
Spill Control	Limits the rate at which a chemical disperses through the environment.
Subject Matter Experts (SMEs)	People who cultivate special knowledge of hazard agents, hazard processes, human behavior relative to hazards, or any of the processes or analyses that support any phase of emergency management.
Substance Inventory	A listing of hazardous substances (usually defined in terms of federal or state statute), their quantities, and their location.
Vulnerable Zone	A geographic area within which people, structures, and environment (agriculture, husbandry, soil, water, etc.) are subject to harm.

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ASSESS YOUR UNDERSTANDING

Go to www.wiley.com/college/Perry to evaluate your knowledge of the emergency planning process.
Measure your learning by comparing pretest and posttest results.

Summary Questions

1. There is a single collection of steps for implementing an emergency planning process that must be used if the process is to be successful. True or False?
2. A government must adopt NIMS only if it chooses to accept federal homeland security funding. True or False?
3. A government-issued guideline for emergency planning and incident management is:
   (a) SOP
   (b) NIMS
   (c) NFPA 1600
   (d) DHS Directive
4. The H/VA identifies all risks; authorities define which risks are acceptable and which should be actively managed. True or False?
5. An emergency damage assessment tells you the actions necessary to decrease known or projected levels of danger associated with a threat. True or False?
6. Belief in disaster myths can cause emergency planners to misallocate response resources. True or False?
7. The standard that sets criteria for creating and operating successful emergency management programs is:
   (a) NFPA 1600
   (b) NIMS
   (c) DHS 1800
   (d) SOP
8. Response speed is the most important factor governing the success of disaster operations. True or False?

Review Questions

1. What is disaster preparedness and what creates it?
2. Why is the emergency planning process more important than the plan itself?
3. Why should the planning process address issues like training and exercising?

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Applying This Chapter

1. You have recently completed the on-line emergency planning course offered by FEMA. Your LEMA supervisor decides to take advantage of this by assigning you to review the local hazard/vulnerability assessment for improvements. What are the critical issues that you will look at?
2. You have been assigned to work with the local fire department to assess whether resources allocated to hazardous materials response operations are adequate. What questions do you need to answer to determine resource needs for any plan operational element?
3. You have been assigned as the team leader for a planning effort to establish an emergency plan for mudslides in Orange County, California. In your first meeting with the County Manager, you discover there is an informal lobbying effort to thwart your team. How can you overcome resistance to the planning process?

YOU TRY IT

Planning for Business

As a new member of the Company Emergency planning Team, you notice that the emergency plan for earthquakes includes elements for "backing up" data currently running, activating the off-site "hot operating system," and protecting the computers themselves from damage. However, there is no plan to educate staff members regarding self-protection in the office during an earthquake or to instruct them about equipment protections. What arguments would you make to the EP Coordinator to get such elements addressed by the planning process and included in the plan?

Initiating Earthquake Planning

You are an emergency planner newly hired in a local emergency management agency in Southwest Arizona. In reviewing the jurisdiction vulnerability analysis, you notice that your town is within 50 miles of the San Andreas fault. You check further and discover that there were 180 moderate earthquake shocks (undamaging) that affected your town last year. The town emergency operations plan contains no mention of the earthquake threat. When you report this and point out the high level of planning in nearby California, the Director hesitates. How will you go about convincing the LEMA that a planning process should begin for the earthquake threat?

The Cost of Disaster Exercises

You have been working for a week to organize the fire and police departments in your jurisdiction to participate in a countywide terrorism exercise. This morning an e-mail went out to all employees from the city manager saying that revenues are down and all efforts must be made to cut expenditures. This afternoon you were asked to justify jurisdictional participation in a county exercise. What reasons will you give?