CHAPTER 12

Fire Department Services Beyond Firefighting

LEARNING OBJECTIVES

- Discuss the components of emergency medical/paramedic services and the qualifications for the levels of care.
- Discuss the challenges associated with special rescue operations.
- Discuss hazardous materials and their effect on the management of an incident.
- Discuss the preparations necessary for airport rescue and firefighting operations.
- Discuss the goals of community disaster planning, preparedness, and response.
- Discuss the meaning of customer service for fire departments.

Introduction

Whereas the only missions of the fire service were once the prevention and suppression of fire and some limited medical/paramedic services, a host of new services have emerged in the past 20 years. These new services consume a large share of the fire department's time and resources and present members with additional responsibilities and challenges. "[T]o meet those challenges, [the fire department] will need to carefully monitor new technologies for possible adoption as well as other beneficial modifications to the way it operates" (Buckman, 2006, p. 444).

Fire officers need to be aware of the following areas, which may be relevant to their departments now or in the foreseeable future:

- Emergency medical/paramedic services
- Confined space and specialized rescue operations, including vehicle and railroad crashes and structure collapses
- Hazardous materials operations
- Airport rescue/firefighting services
- Community planning and preparedness for and response to disasters, including such diverse emergencies as floods, earthquakes, tidal waves, riots, tornadoes, hurricanes, terrorist attacks, and other natural or human-caused incidents
- Customer services, including the use of facilities and human resources to assist the community in ways such as providing shelters for abused children or neighborhood medical centers
- Consolidation of smaller departments into larger ones (Buckman, 2006, p. 444)

Although this chapter discusses these different services, it is beyond the scope of the text to offer specific guidelines for each service. Using the fire service–specific and leadership guidelines as models should make it fairly easy for officers to develop guidelines for any functions relevant to the department that are not covered by the fire service–specific guidelines.

The best way for an officer to write appropriate fire department function guidelines is to base them on the goals of the function. For example, to prepare a meaningful guideline, the officer in charge of the function could apply the following steps:

1. Formulate goal statements, with appropriate participation from those stakeholders that should be involved.
2. Use the goals to prepare a general (basic) guideline statement and, where appropriate, objectives.
3. Obtain agreement on the guideline from relevant stakeholders.
4. Prepare specific supporting guidelines based on the goals and objectives for the function.
5. Review and finalize the specific guideline statements with the team of stakeholders that were involved in writing the goals and objectives.

SCENARIO

Rollin's Depot Fire

It was a little after 1800 hours when the Station 2 crew of the Millhouse Nixon Volunteer Fire Company was out on the road performing a familiarization trip through the far side of their fire district. The fire chief, who was strongly committed to community service, introduced these trips into the department a few months earlier, and they had been well received by the department's personnel. They liked the fact that it allowed them to get out of their stations and meet people from the community.

The five members of the Station 2 crew—newly elected fire lieutenant Greg Perez; driver Mary; and fire fighters Katie, Ryan, and Mike—were visiting with the owner of a local fast-food establishment when the pagers on their belts suddenly sounded loudly. They were informed of a reported smoke condition at Rollin's Depot, a local garden products store located off the highway at the south end of town. The crew returned to their pumper and, while en-route, began to review what they knew about the location. Having done a walk-through about a year ago, they were aware that there was a wide variety of hazards in the structure at night. They remembered that landscaping equipment and other lawn-care materials were stored in the storeroom in the rear of the building. They pulled up the store's preincident plan on the onboard computer, which provided additional important information about the entire store, including the storeroom area. They were also able to pull up a sparse amount of information about the last inspection, which had been conducted by the township fire prevention bureau.

Neither the fire fighters nor the newly elected lieutenant regularly shopped at the store; however, a number of years earlier, the department had responded to a small fire in the rear of the building that had been started by an overheated electric motor. Fortunately, two of the crew members had been to that call. They shared what they knew with the lieutenant and the other crew members, emphasizing that lawn-care chemicals, small amounts of kerosene, pesticides, and fertilizer were stored in the storeroom. Mary pointed out that it might be worth considering, during size-up, that the store was located on a sloped and elevated plot of land that backed up to a creek on the south side of the structure. If there was a fire, a wide range of chemicals and toxic by-products could possibly be washed into the creek from any water run-off. Concentrating on the store as it came into view, the lieutenant nodded that he had heard what the crew members were saying.

As the unit arrived on location, the crew noted that there was heavy smoke at the rear of the structure, in or near the storage area, and the lieutenant reported a working fire in a large one-story mercantile property. The building was of block construction, with a flat metal roof. There were small windows located high up on the walls. Smoke was rolling out of two windows on the south side of the structure, but it seemed that access was possible through a door located on the north side.

The lieutenant established "Rollin's Command" and gave a size-up of the incident, including the following instructions: "Katie, you and Ryan stretch the 1¾-inch line and hit the fire from outside of the door. We have to wait for the next company to get here to have the 'two-in, two-out' we need to go in. Mary, be sure to give Katie and Ryan the Class A foam on their line."

The lieutenant's size-up confirmed that some sort of viscous fluid had found its way out of the south side door and seemed to be headed down the grade of the parking lot toward the nearby creek. He advised the responding rescue company that their hazardous materials spill control equipment would be needed.

Before the fire was under control, two injured store employees were found on the floor of the main showroom, near the door to the storeroom where the fire was located. The lieutenant immediately asked the dispatch center to notify the police and make sure two EMS units were dispatched to the scene.

While Lieutenant Perez, Katie, and Ryan concentrated on the fire, and Mary remained with the apparatus, the lieutenant ordered Mike to stay with the two injured employees and give as much first aid as he had been trained in until the EMS units arrived.

SCENARIO *continued*

Concerned about the adequacy of the water in the tank, Lieutenant Perez called the next-due engine company and asked them to establish a water supply source from the hydrant on the A side of the structure and to stretch a second attack hose line from his pumper to back up the initial attack line.

At this point the lieutenant paused to ponder the operation. "Have I missed anything?" he wondered. Prior to this situation, the chief had discussed EMS and several other non-firefighting functions (including hazardous materials response) and developed departmental guidelines for them, following the steps outlined in this text.

Scenario Analyses

For your convenience, key words associated with the fire service–specific guidelines and the leadership guidelines are listed prior to the scenario analyses Table 12-1. Before reading the scenario analyses, you may want to give some thought to how the guidelines apply to the scenario. Doing so will give you some initial practice in thinking about the guidelines and provide a foundation for gradually developing the habit of using them. As previously noted, memorizing a personal, abbreviated version of the guidelines and applying it to every relevant decision will help to ensure the highest quality performance is achieved under the existing circumstances.

Table 12-1 Decision Guideline Key Words

Fire Service–Specific	Leadership
Incident command	Participation
Prevention	Communications
Planning	Norms
Safety	Satisfaction
Physical resources	Cooperation
Financial resources	Competence
Personnel	Reviews
Training	Goals

Scenario Analysis: Fire Service Function Perspective

The Incident Command Guideline is the primary fire service–specific guideline that is relevant to the scenario. The Fire Service Training Guideline is also quite relevant.

Incident Command Guideline

Key Words: Incident Command

What should be considered during the size-up and the attack in order to achieve the most appropriate strategy and tactics to protect people—both civilians and the fire fighters at risk—and to preserve and protect property? Specifically, the following three basic questions and their critical elements should be considered:

1. What's there? The scenario presented here presents no threat to the life and safety of civilians. In light of the building's limited size, the threat to fire fighters primarily involves the special hazard presented by the danger of the landscaping materials exploding and the spill resulting in contamination.

The lieutenant does not order any special precautions regarding the explosion. Had he thought more thoroughly about this guideline, the threat of explosion would probably be high on the list of considerations. The captain satisfied the problem presented by the terrain—namely, the flow-off of contaminants—by instructing the crew to take precautions and by informing the additional responders that help would be needed.

2. What does the situation require, including possible involvement of other agencies? If no separate guidelines for hazardous materials or emergency management

relations exist, two additional questions may be considered for the scenario:

- What does the situation need with respect to the contamination risk involving the creek?
- What needs to be done with respect to relations with other agencies?

The lieutenant appropriately notified the police, and, though there is no mention of it in the scenario, he probably also notified the local environmental agency, especially if he was aware of this or another guideline on relations with other agencies. Other elements related to this question—rescue, emergency medical services (EMS) support, and exposure protection—are not relevant to this situation; however, confinement and attention to community interests deserve consideration.

Confinement needs to be interpreted more broadly to include not only confinement of the fire but also confinement of the spill and securement of the site for the police. Attention to community interests is a more complicated issue and requires deeper thought. If the lieutenant has cultivated the habit of considering the guidelines, he might consider what can be done to notify the available media and quickly inform regular store customers about any restrictions that have to be imposed. He might also have asked the following questions:

- How can the department help make the store accessible as soon as possible after the fire, such as by helping with the salvage of landscape equipment to remove them from the chance of further contamination?
- What steps might be needed to protect community interests in light of what local or county environmental response groups might do to prevent the impact of the spill downstream for people and businesses? The lieutenant might have had one of the team members build a small dike to keep contaminated water from reaching the creek until the rescue company arrived with spill-control equipment.

3. What is available to meet the needs of the situation? This question does not concern any issues the lieutenant would not have considered, except possibly the choice of extinguishing materials—for example, whether water was appropriate in the situation, in light of the extensive flow-off and the lack of information about hazardous materials that might be released during the fire attack. That issue, however, might be reviewed at a later time if the company did not carry adequate supplies. A department using the fire service–specific guidelines might consider reviewing the following guidelines:

- The Fire Prevention and Code Enforcement Guideline, to determine where its application might be strengthened
- The Preincident Planning and Related Loss Reduction Functions Guideline, to determine whether the preincident plan needed updating
- The Fire and Life Safety Education Guideline, to determine whether it should also consider alternative venues, such as landscaping activities, that are not included in education programs

Additionally, the department might consider whether a standard operating guideline or standard operating procedure should be developed to address when the confinement effort should be restricted to the use of water until more appropriate materials are available.

Fire Service Training Guideline

Key Word: Training

The Fire Service Training Guideline should almost always be reviewed at a time that is convenient rather than during an emergency incident. This guideline extensively overlaps with the leadership guideline on competence.

The scenario provided only one mention of training, when the lieutenant ordered Mike to stay with the two injured employees and give as much first aid as he had been trained in. There are a wide variety of training needs with respect to EMS and hazardous materials responsibilities. Different competence levels have specific training requirements and training support systems, as discussed later in this chapter. It is not clear whether the training mentioned in the scenario involved the first level of basic medical care or the second level of basic life support.

The department probably has an EMS guideline to follow. If not, the lieutenant should either urge the chief to develop one or to create one with his team for use in the company. In any case, it is important for fire officers to be fully aware of such a guideline and to ensure that all the members of the team are aware of it. Because situations involving the need for medical care are not likely to come up regularly, it is necessary for officers to arrange regular refresher sessions. The same concept applies to the many facets of working with hazardous materials emergencies.

Scenario Analysis: Leadership Perspective

The scenario does not indicate a need for immediate consideration of Guideline 3—Norms, Guideline 4—Satisfaction, Guideline 7—Reviews, and Guideline 8—Goals; however, the lieutenant might still choose to reflect on his competence regarding these guidelines and what he could do to ensure that he develops a solid habit of considering them with every decision, strategy, and tactic.

FYI

While not all of the fire service–specific guidelines are fully relevant to officers in volunteer and combination fire departments, the leadership guidelines are almost equally applicable in all types of departments.

Guideline 1—Participation

What should be done to ensure that appropriate participation is used in all decisions and plans? (This guideline is discussed further in Appendix A1, Additional Insight 1.)

The scenario does not mention any specific participation during the incident; however, the fact that no fire fighters offered suggestions indicates that either participation is not a regular practice in the department or the fire fighters were satisfied with the lieutenant's tactical steps and would have offered suggestions otherwise. The open participation that occurred prior to arriving at the incident, during the discussion pertaining to location features, seems to favor the latter.

Guideline 2—Communications

What should be done to ensure that everyone is aware of what should be communicated—by whom, to whom, when, and how—so all will have the information they need and can expect to receive? (This guideline is discussed further in Appendix A1, Additional Insight 2.)

The prearrival discussion among the fire fighters indicates effective communications within the department; little is known, however, about the extent to which the lieutenant communicated the need to consider the fire service–specific issues that are appropriate in most situations.

Guideline 5—Cooperation

What should be done to ensure the highest possible level of cooperation and coordination and to avoid damaging conflict within the department, with mutual aid departments, and with other agencies potentially involved in emergencies? (This guideline is discussed further in Appendix A3, Additional Insight 5.)

While the scenario demonstrated sound cooperation and coordination, an officer who is familiar with the guidelines will continue to keep an eye out for any indication of possible problems. If any problem had turned up, it could have been used as a foundation for future discussions at meetings, more formal training sessions, or coaching or on-the-job training with individual team members.

Guideline 6—Competence

What should be done to achieve the highest possible competence for every action? (This guideline is discussed further in Appendix A3, Additional Insight 6.)

After the lieutenant realized that he had overlooked the need to create a dike to stop the flow of contaminated water toward the creek, he should have asked himself what procedures he should consider learning so that he would be less likely to overlook something in the future.

FYI

Having now read the scenario analysis, recall your initial thoughts about the application of the guidelines to the scenario. How did they compare to the insights offered in the analysis? Hopefully this comparison will help reinforce your appreciation of the guidelines.

Emergency Medical Services: Prehospital Care for the Injured and Acutely Ill

Overview

The purpose of **emergency medical services (EMS)** is to save lives and reduce human suffering. EMS provides the victims of life-threatening injuries and illnesses, or lesser trauma, with critical medical intervention.

The modern model for EMS systems has been evolving since the mid-1960s; today these systems are composed of a number of commonly accepted components. Despite this uniformity, EMS varies among states and provinces. Depending on state and local regulations, there may be several levels of training, certification, and licensing for fire personnel who serve as **emergency medical technicians (EMTs)**. Generally, the first responder's role can be divided into three levels of service:

1. Basic medical care and rescue and extrication
2. **Basic life support (BLS)**
3. **Advanced life support (ALS)**

To provide the different levels of services, fire fighters must be trained and certified by state and sometimes local authorities as either EMTs or **paramedics**. Every state EMS program requires technicians to be recertified every few years. Paramedic certification requires an even higher level of competence in both medical knowledge and medical techniques and skills.

Basic Medical Care and Rescue and Extrication

This level of EMS is usually provided by the first response apparatus. The role of fire fighters is generally limited to extricating victims from a vehicle, other accidental confinement (such as a building collapse or a fall into a confined space), or fireground search and rescue. Basic first aid, including **cardiopulmonary resuscitation**, is administered by fire fighters who have first response training and certification. Hospital transport is usually provided by an ambulance, which may be supplied by a different fire service company, the police, or a paid or volunteer ambulance company.

Basic Life Support (BLS)

BLS is provided by EMT personnel who may arrive at the scene in a fire department vehicle, in another organization's ambulance, or in a private car. BLS offers more than basic first aid; it uses EMS life support equipment such as oxygen, defibrillators, and other first aid materials. Some municipalities provide life support through engine or ladder companies equipped with BLS equipment. Operating from neighborhood fire stations, these units can quickly arrive on location and initiate and sustain EMS until a transport vehicle arrives. Some communities use dedicated fire service transport ambulance units; otherwise, transport to the hospital is provided by other sources.

Advanced Life Support (ALS)

ALS services are delivered by personnel trained to the paramedic level, for which the educational

and training requirements are more stringent. The level of service provided is technically complex and includes the administration of medications that are carried on the apparatus and administered on the authority of a physician who is contacted by telephone or radio. The paramedic "usually is the most thoroughly trained and highly qualified category of pre-hospital EMS personnel. Advanced life support (paramedic) services are obliged to operate within the policies and procedures established by their medical director, who may or may not be employed by the fire department" (Cote, 2003, p. 7-2008).

In a fire department ALS program, service is performed by engine company paramedics. When they are not in their own ambulances, fire department paramedics may ride in the ambulance of another public- or private-sector operation, with the fire department providing the actual paramedic-level service.

History of EMS

It is commonly thought that EMS and paramedic services are a product of the late 20th century, but this belief is far from true. Ambulance service has existed in North America for a long time. Funeral homes, hospitals, and police and fire departments have all provided EMS services for many years. In fact, up until the 1970s, someone from the local funeral home might have transported a seriously ill or injured patient to the hospital in a one-person ambulance (which looked much like a hearse) with no medical equipment. In larger cities, local hospitals generally provided ambulance service. In other communities, it was provided by the police department or was the responsibility of the local fire department.

In the United States, some fire departments began providing first aid and medical rescue services to the public as early as the 1920s. During the 1960s, however, fire departments assumed a much larger role in EMS services. The availability of federal grant money allowed the fire service to develop EMS programs, and a number of fire departments took advantage of funding sources to create or expand EMS protection in their communities. Federal involvement in enhancing EMS operations in the fire service slowed during the 1980s as grant money became more difficult to obtain.

Despite the fire service being a tradition-bound "industry," its role in EMS continues to steadily and sometimes rapidly expand, due to the decreasing need for fire suppression services. Fewer fire calls do not lessen the importance of having a prepared firefighting force; however, with more time available, the fire service is in a unique position to offer a variety of other emergency services. Whereas EMS was originally considered a supplement to fighting fires, it is now viewed as a major component of the fire service. Today the vast majority of fire departments provide EMS on a routine basis, with these services accounting for three-fourths or more of all alarms received in many departments (Cote, 2003, p. 7-207).

The Future of EMS in the Fire Service

The future of EMS in the fire service is impacted by a number of conflicting forces, such as the following:

- Continuous changes in health care that require new equipment and frequent training to maintain competency
- Emerging for-profit and nonprofit local organizations that provide complete or partial EMS
- Differing levels of government support for EMS
- Conflicting opinions about the appropriate compensation for the higher training and skill required of EMS personnel
- Conflicting opinions about which agency (fire service or police) should provide the various components of EMS, especially in light of the potential for higher compensation
- Quality assurance with medical control

The most important influences are those that are in some way related to the budget. As a result, fire departments use various innovative financial approaches to EMS. Some departments charge for EMS or, at least, for the transportation component of it; some even offer nonemergency transportation services. Other departments research costs and develop economic and moral justification for EMS. Armed with that information, a public information program can generate the support needed so that the local government can appropriate the necessary funding.

The cost-effectiveness of a fire department providing EMS is influenced by the specific manner in which the department operates its EMS unit, the ways in which it budgets for expense and capital items, and the outside influences of private EMS operators. The following steps can help the fire department evaluate the financial benefits of saved lives and reduced disabilities (Brahme, 1992):

1. Make direct financial comparisons between public and private service providers.
2. Evaluate the performance of fire agency EMS programs based on costs and benefits to the community.
3. Set fair, reasonable, and competitive values on services provided.
4. Perform comparisons with other agencies of comparable size and circumstance that apply the same model.

Throughout the process, it is important to effectively communicate with public officials and customers.

To retain and even enhance their future role in EMS delivery, fire departments need to be creative within the constraints of local, state or provincial, and federal law. For example, departments may be able to increase their operating revenues by providing nonemergency transport and billing the patient's insurance company. Departments might also deliver preventive medical services, similar to the way they provide code enforcement or public education. For example, the fire department of Springfield, Oregon, provides a wide range of BLS, ALS, and nonemergency services. BLS ambulances are staffed by personnel trained to the EMT-B level, and ALS units are staffed by paramedics capable of performing more advanced aid under the control of a hospital-based physician.

Support for Fire Service EMS

Fire departments have allies in their efforts to establish sound, effective EMS. The International Association of Fire Fighters (IAFF) and the International Association of Fire Chiefs (IAFC) have developed strong policies in support of maintaining an effective EMS presence within the fire service. They have also created working member interest sections and committees to strengthen the ability of fire service EMS to maintain a strong and fully justifiable presence in the emergency medical field. The IAFF believes that fire departments should be the primary providers of EMS in North America.

FYI

The IAFC and IAFF can be contacted at the following addresses: International Association of Fire Chiefs, 4025 Fair Ridge Drive, Fairfax, VA 22033; International Association of Fire Fighters, 1750 New York Avenue, Washington, DC 20006.

Officers who are assigned to operate and supervise fire department–based EMS operations are offered additional support at the national and state levels. National fire service organizations have created staff positions to assist members in the EMS field, and NFPA technical standards, such as NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, and NFPA 1581, *Standard on Fire Department Infection Control Program*, address issues regarding EMS provision in the fire

service. Additionally, the National Fire Academy in Emmitsburg, Maryland, offers an ongoing EMS management training program. The program provides "fire service administrators an opportunity to develop a working knowledge of current and future issues that affect the delivery of EMS through a fire department" (Cote, 2003, p. 7-2008).

Fire Officer Issues in EMS

An important challenge for the officer in charge of a company with EMS responsibilities is to maintain full competence in both fire suppression and EMT (or possibly even paramedic) knowledge and skills. These challenges include the following:

- Mandatory continuing training requirements
- Possible morale issues related to an increased workload
- Labor relations issues, including salary differentials, work schedules, and outside training
- Infection control issues

Confined Space and Special Rescue Operations

Confined space and special rescue operations present management challenges similar to those presented by EMS, as well as the need for expensive specialized tools, training, and drills. NFPA has developed two standards relating to the field of technical rescue: NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, and NFPA 1006, *Standard for Technical Rescuer Professional Qualifications*. Based on these standards, fire officers can create programs that will allow them to train all staff to a common standard.

Fire departments have always provided rescue services. In the classic sense, rescue consists of searching for and removing endangered persons from dangerous situations. Because fire departments own extrication equipment, they are the natural agencies to rescue people trapped in motor vehicles. Due to the increase in automobile traffic, this function has grown in importance in the past two decades.

The need for more specialized forms of rescue has also grown due to society's becoming more technologically complex **Figure 12-1**. Today fire officers are expected to be proficient in many diverse types of rescues:

- High- and low-angle rescue
- Industrial extrication and entrapment rescue
- Vehicle rescue

Figure 12-1 Fire fighters may be expected to perform many specialized forms of rescue.

- Confined space entry and rescue operations
- Trench and evacuation rescue
- Below-grade rescue
- Structural collapse rescue
- Urban search and rescue
- Swift water rescue
- Ice rescue
- Search and rescue

To assess a community's current and future needs for specialized services, fire officers should review the community's records and determine what has occurred in the past. Only after a community has prepared a thorough risk assessment can it decide what to accomplish next.

Special rescue operations frequently require unique equipment and skills; therefore, money must be budgeted to pay for these services. Like all government activities, fire departments constantly search for greater efficiency to reduce costs. One promising approach is pooling the people and equipment of contiguous communities into regional service arrangements. Challenges to this approach exist, however. In addition to jurisdictional disputes over control and cost sharing, pooling presents the need for joint planning and cooperation with a long-term, sincere commitment to the concept. All of these issues must be addressed and made part of the community response planning process.

Search and rescue tactics range from the simple room-to-room primary and secondary searches performed at every structural fire to the major large-area floor searches performed during high-rise firefighting operations. The procedures are essentially the same, although the breadth and magnitude of the operation increase in size and complexity. These "procedures are critical to effective fire extinguishment, rapid victim location and removal, and firefighter safety" (Buckman, 2006, p. 332).

There are also certain times and places, such as during a natural disaster or a terrorist attack, in which more complicated procedures come into play. Such procedures must be a part of the preincident planning process. In this way, the right resources can be identified and then incorporated into the plan. Additionally, preincident planning helps ensure procedures are organized so that each area of the operational scene is properly scanned.

Hazardous Materials Response

The fire service faces two major challenges when it comes to hazardous materials: (1) preventing emergency incidents involving hazardous materials and (2) responding to such emergencies. To successfully address these challenges, fire officers must understand the diverse nature of hazardous materials and the laws and regulations governing their use.

Understanding Hazardous Materials

Fire service personnel usually lump all materials that have unique potential dangers beyond those of structural fires under the generic label of hazardous materials. Legislation and regulations often separate these materials into smaller, more specific groups of substances. Fire officers should be aware of the definitions used for the groups of substances relevant in their areas. Because legislation was passed and regulations were issued at different times and by different levels of government, the definitions have considerable overlap. For instance, radiation hazards, biohazards and other toxins, explosives, and incendiaries are often included in several groups. The following grouping categories are widely used and serve as a starting point for understanding and managing hazardous materials.

Hazardous Materials

The U.S. Department of Transportation defines a **hazardous material** in Title 49 of the Code of Federal Regulations as "any substance or material in any form or quantity that poses an unreasonable risk to safety and health and property when transported in commerce" (49 CFR 171.8).

Hazardous Substances

A **hazardous substance** is any substance that poses a threat to waterways and the environment when it is released into the atmosphere or into a body of water. The Clean Water Act and the Comprehensive Environmental Response, Compensation, and Liability Act provide the basis for this definition. The Occupational Safety and Health Administration (OSHA) regulations also make reference to these materials, for which the list is quite long.

Extremely Hazardous Substances

Extremely hazardous substances are chemicals that have been listed by the **Environmental Protection Agency (EPA)** as possessing properties that are extremely hazardous to a community during an emergency spill or a release. The hazardous nature occurs as a result of the chemical and physical properties of the substance (40 CFR 355).

Hazardous Chemicals

Hazardous chemicals are defined by OSHA regulations as "any chemical that would be a risk to employees who are exposed to it in the workplace" (29 CFR 1910). The materials pose a risk because of their associated health, flammability, and reactivity hazards.

Hazardous Wastes

Hazardous wastes are the discarded materials regulated by the EPA for health and safety reasons. Authority to regulate these materials comes from the Resource Conservation and Recovery Act (40 CFR 260).

Marine Pollutants

Marine pollutants include a number of materials that can have a negative impact on the waterways. Fire officers can gain valuable assistance with problems involving these materials by contacting the U.S. Coast Guard.

Dangerous Goods

The term **dangerous goods** is used in Canada to describe the substances called hazardous materials in the United States. Information on dangerous goods can be found in the International Maritime Dangerous Goods Code.

Federal Legislation and Regulations Involving Hazardous Materials

During the 1980s, the fire department's role in responding to emergency incidents involving hazardous materials dramatically expanded. "Public interest in the environment and major catastrophes involving hazardous materials . . . resulted in the promulgation of a wide range of laws, regulations, and standards that mandate fire department involvement" (Cote, 1997, p. 10-90). Most of these laws were enacted in response to specific catastrophes, such as the contamination of Love Canal in New York State and the explosion in Bhopal, India.

Many fire departments were not initially prepared to assume this additional responsibility; however, the modern fire officer must be familiar with the laws and regulations involving hazardous materials, as they affect a fire department's ability to protect the community.

Federal Water Pollution Control Act

The first of many laws to protect the environment was enacted in 1970. The **Federal Water Pollution Control Act** gives the EPA and the U.S. Coast Guard the authority to control the release of oil and other hazardous substances that can pollute the marine environment. One primary provision of this law mandates that facility operators provide a spill control plan indicating how to control toxic releases to the marine environment. The spill control plan must have the following provisions:

- Hazard assessment
- Emergency notifications
- Personnel requirements
- Equipment inventory

- Protective clothing
- Plan implementation
- Plan termination

Toxic Substances Control Act

In 1976 the U.S. Congress passed the **Toxic Substances Control Act**, which gives the EPA responsibility for the following functions:

- Developing a uniform listing of all chemical substances
- Establishing a testing procedure for chemicals already in use and for approximately 1000 new chemicals developed each year
- Determining if these chemicals present an unreasonable risk to the public's health or the environment
- Prohibiting or limiting the manufacture, processing, use, application, and concentration of such chemicals
- Recalling or seizing by civil action hazardous substances that are determined to be imminently harmful to the public's health or the environment (Cote, 1997, p. 10-90)

Resource Conservation and Recovery Act

In 1976 the **Resource Conservation and Recovery Act (RCRA)** was also produced. The legislation, which was an omnibus approach to handling the problems inherent in the disposal of solid and hazardous waste, established programs to address four major areas of concern:

- Solid waste
- Underground storage tanks
- Medical waste
- Hazardous waste

The legislation's comprehensive guidelines gave the U.S. Department of Transportation and the EPA the authority to regulate the transportation of hazardous waste materials. In 1984 the guidelines were broadened and the original law was modified to include a wider range of hazardous materials.

The Comprehensive Environmental Response, Compensation, and Liability Act

In 1980 Congress passed the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** to address the problems caused by the release of hazardous materials into the environment. CERCLA identified procedures for reporting and responding to hazardous materials incidents and for the EPA to inventory uncontrolled hazardous wastes in the United States. It also provided funds for the cleanup of major hazardous waste sites and established procedures for finding those responsible for the releases so that fiscal liability could be established. The law serves as the basis for many cleanup operations.

Superfund Amendments and Reauthorization Act of 1986

Among the laws and regulations enacted for environmental protection, the **Superfund Amendments and Reauthorization Act of 1986 (SARA)** "has had the greatest impact upon hazardous materials emergency planning and response operations" (Cote, 1997, p. 10-93). In this legislation, the original CERCLA law was revised to provide for a stronger response to emergencies involving the release of hazardous materials. Title III of this legislation, or the Emergency Planning and Community Right-to-Know Act, defined the planning approach to be used by industry, government, and emergency response personnel. It also defined procedures for release notification, inventory reporting, and toxic release inventory. A large part of this law also involved the development of training programs for emergency response personnel.

Occupational Safety and Health Administration (OSHA) Hazardous Materials Regulations

OSHA regulations for personnel protection have an important impact on the way fire departments respond to incidents involving hazardous

materials and hazardous waste. The **Hazardous Waste Operations and Emergency Response Operations** regulation (29 CFR 1910.120), known as HAZWOPER, spells out requirements for fire department operations during emergencies involving hazardous materials or hazardous wastes:

- A hazardous materials response plan
- The use of an incident management system
- The need for buddy system operations
- Backup personnel requirements
- The need for a safety officer
- Specific training requirements
- Refresher training requirements
- Medical surveillance programs
- Post-emergency termination procedures (Cote, 1997, p. 10-96)

The HAZWOPER regulation specifies training requirements for the various levels of emergency responder. Fire departments are required to train their personnel to a given level and then conduct periodic refresher training to maintain skills. NFPA's *Fire Protection Handbook* provides additional information regarding this topic.

Prevention of Emergency Incidents Involving Hazardous Materials

As with fire prevention, code enforcement efforts have long been a part of the fire department's role in preventing exposure to toxic substances and fire incidents involving hazardous materials. Enforcement efforts—including those relating to the manufacture, storage, and transport of hazardous materials—are based on the laws, ordinances, and regulations in effect, including those of federal, state, and local authorities.

Two activities permit fire officers to assist in reducing the risk of emergency incidents involving hazardous materials:

- Ensuring that fire fighters (or inspectors) are fully aware of the codes pertaining to these materials or at least sufficiently aware that they know when to obtain clarification on whether a specific situation might present a risk
- Ensuring that codes are enforced strictly when finding violations during inspections, when updating preincident plans, and when investigating citizen complaints about odors that were referred to the fire department

Emergency Responses Involving Hazardous Material Incidents

Fire departments have long played an important role in responding to emergencies involving flammable and combustible liquids and gases. They have had far less involvement with other hazardous and toxic materials; however, these types of responses are on the rise. Regardless of a community's size, fire officers must always consider the possibility of encountering hazardous materials during emergency operations. Ensuring adherence to NFPA codes and compliance with the applicable state, provincial, and federal regulations for planning, training, and emergency response is the best way to prepare for this eventuality.

FYI

Additional guidance on hazardous materials response can be found in the following NFPA documents:

- NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*
- NFPA 473, *Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents*

Any time fire fighters are exposed to hazardous materials, they must undergo a complete medical evaluation to ensure that they have not been adversely affected and take remedial steps if necessary. This is often one of the most neglected aspects of response. All personnel must be properly trained in the appropriate methods of decontamination, and fire departments should create response decontamination plans (including plans for mass casualty

decontamination and personal decontamination) as part of their overall community emergency response plan. Fire officers must be well versed in their role within these plans.

Airport Rescue/ Firefighting Services

Aircraft emergencies infrequently occur; however, fire departments must consider the potential for such events. Personnel have to be trained to know and understand the various types of aircraft that might fly over their area. Departments can start to prepare for aircraft emergencies by contacting the nearest aviation facility and exploring what types of aircraft are in use and which ones present the possibility of an incident. The hazards and challenges of such incidents form the basis for preparing to deal with aircraft emergencies at off-airport locations.

Saving lives is the primary reason for providing airport rescue and firefighting services. Incidents involving aircraft have the potential for catastrophic outcomes. The opportunities for saving lives are usually greatest when the emergency occurs at or near an airport, as specialized crash/fire/rescue equipment is concentrated at those facilities.

Fire officers must be aware of the hazards that exist at locations where aircraft are operated or stored:

- Flammable liquid use and storage on the aircraft and at the airport
- Storage of flammable and combustible materials on the aircraft
- Hazardous materials used on aircraft, such as liquid oxygen

Fire departments should also consider training and preparing for aircraft emergencies at locations that may be overflown by commercial or general aviation traffic. Planning and preparation involve the following considerations:

- Identification of potential hazard levels for aircraft emergencies
- Identification of available firefighting foam stocks for deployment to such incidents
- Provision of initial and periodic fire fighter training to prepare for aircraft emergencies

NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports*, provides the requirements for airport fire protection.

Community Disaster Planning, Preparedness, and Response

Planning and Preparedness

Each year, the fire department is called upon to respond to a wide range of emergencies that have nothing to do with fire. The fire department receives calls for nonfire emergencies for several reasons:

- Fire department response is rapid.
- Fire department personnel are trained and equipped to handle a wide range of emergencies.
- Fire stations are geographically distributed.
- The ability of a department to respond is not limited by geographic or municipal boundaries.
- The fire department is the logical focal point for emergency preparedness.

The public looks to the fire department to help with even relatively minor emergencies, such as flooded basements or electrical and heating system malfunctions, that create potential hazards to property or health. People may call the fire department for storm-related damage ranging from a downed utility pole to massive destruction wrought by tornadoes, hurricanes, floods, or major snow and ice from winter storms.

The fire service's role in these emergencies naturally draws it into the complex process of emergency and disaster planning that involves federal, state, and other local agencies. At the federal level, disaster planning and response are the responsibility of the Federal Emergency Management Agency (FEMA). Training

in disaster response planning and operations is available from FEMA's Emergency Management Institute located in Emmitsburg, Maryland. At the state level, emergency management organizations assist local communities in developing plans and programs to meet their specific needs. Guidance is also available from NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity Programs*. This document "establishes minimum criteria for disaster management for the private and public sectors in the development of a program for effective disaster mitigation, preparedness, response, and recovery" (NFPA, 2013, p. 1600-4).

In recent years, as the need to prepare for acts of terrorism has become more urgent, fire departments have had to consider how to mitigate the potential destructive effects of biological, incendiary, radiological, chemical, and explosives incidents. Here, too, FEMA provides information, guidance, and training.

Specific response planning is practically impossible because of the variety of potential disaster types and the vast range in the severity of outcomes. Government agencies, therefore, primarily focus on general issues of preparedness. A fire department can start preparing for disasters by networking with the agencies and private groups that respond to emergencies, including the following:

- Specialized police squads, such as bomb squads and K-9 units
- Local, county, regional, and state emergency management agencies
- Engineering resources at local, county, and state governments who can assess the structural stability of damaged buildings, shorelines, or infrastructure elements
- Government and private organizations that provide heavy construction equipment for earthmoving, temporary dams, building collapse, demolition, and other possible pre- and post-disaster contingencies
- Telephone, gas, electric, and water utilities
- Disaster relief agencies like the Red Cross and Salvation Army, as well as religion-affiliated agencies that provide food and shelter
- Schools, churches, and synagogues and National Guard and Army Reserve armories that can be opened as emergency shelters
- Police who provide traffic and crowd control, including evacuating populations and preventing violence and looting
- Volunteer organizations for services such as sandbagging, food service, messenger service, and transportation
- Communications facilities, in the event that the fire department's system is inadequate to meet all the demands of the emergency
- Environmental authorities
- Dentists and physician specialty groups
- Pathologists
- Members of the clergy
- Mental health workers

If a fire department establishes and maintains contact every few months with all relevant groups, it will be as prepared as possible for the unexpected.

Some natural disasters—such as hurricanes, tornadoes, earthquakes, volcano eruptions, and flooding—are not totally unpredictable or unexpected. When a department is in an area where such disasters occur, more specific planning and preparedness are needed.

With the increasing likelihood of terrorism, potential target areas should prepare for these disasters. The Office of Grants and Training at the Department of Homeland Security provides tailored training to enhance the capacity of states and local jurisdictions to safely and effectively prevent, deter, and respond to incidents involving terrorism and weapons of mass destruction. Additionally, a variety of courses addressing the issue of terrorism are provided by the National Fire Academy and the Emergency Management Institute, and additional information is available from the Department of Homeland Security (www.dhs.gov) and FEMA (www.fema.gov).

Specific planning and preparation for disasters are best done by a committee composed of all involved agencies, including the fire department. A disaster plan should spell out each agency's roles and responsibilities. When disasters are a serious, expectable threat, periodic drills should occur in order to identify problem areas, tighten procedures, and ensure thorough preparedness.

Disaster education programs can be a valuable tool in community disaster preparation. Fire departments can perform a distinct service by arming their communities with the skills to prepare for and survive a disaster. Educating the public involves developing literature and classes that impart the appropriate knowledge and behaviors and motivate people to prepare for disasters.

Response

Proper planning improves a community's ability to respond to and recover from disaster situations. By anticipating what might occur and preparing an appropriate response plan, fire departments will be better prepared to help citizens deal with the interruptions occasioned by natural disasters or those that are caused by humans.

A fire department's disaster response plan should involve most or all of the following actions:

- Providing early warning, when possible
- Responding to specific emergency conditions as notifications are made
- Staffing emergency operation and communications centers
- Assisting in opening shelters organized by cooperating agencies, institutions, and groups
- Providing logistical support as required
- Coordinating the response of mutual aid and outside agency assistance according to the roles developed by a multiagency committee that is made up of representatives from the fire and other emergency response organizations in the area. This committee outlines the types of responses that are to be made.
- Assisting in the recovery phase with personnel, tools, and equipment

Community Emergency Consultation

Assisting in the development of community-wide emergency preparations is an important fire service function. The department can stimulate interaction among citizens and community officials, and fire department officers can improve response during times of crisis. Comprehensive response plans can define roles and relationships, provide for coordination during times of crisis, and identify problem areas. All of these nonemergency tasks can improve a community's reaction to emergency situations.

Customer Service

For more than 200 years, fire departments considered themselves to be reactive organizations. When a problem involved fire, the fire department responded. Fire officers often did not pay much attention to community needs that were not related to fire suppression. During the later part of the 20th century, however, the number of fire-related responses significantly dropped. To justify existing staffing levels, fire departments have had to search for additional services to deliver.

Effective fire protection, EMS, and other related emergency services are still the primary purposes of fire departments; increasingly, however, like other government agencies, fire departments are coming to see the community's citizens, their guests, and other visitors as the "customers" of all the services they deliver. The needs of the people who are being served have thus become a major focus of progressive fire departments throughout North America. This new approach is known as **customer service**.

Customer-based thinking and policies strengthen the relationship between fire departments and their communities. When properly implemented, the customer service approach can lead to greater public support for fire departments, which is particularly helpful during times of budget restrictions when cuts in department resources need to be avoided. Public support is equally crucial whether a department is career, volunteer, or combination.

At the same time, the broadening of services brings new challenges for fire officers. Departments have to provide additional training, maintain more equipment, and deal with sudden work overloads that place new stresses on staff members. All these tasks make it more important for officers to do all they can to satisfy the guidelines for superior organizational performance.

WRAP-UP

Chapter Summary

- The growing complexity of services rendered by fire departments makes management competence even more important than it was in the past.
- Officers must make a wider variety of decisions, many of them more complex, concerning more difficult choices in an environment of greater ambiguity.
- Effective guidelines and thought habits are key elements in ensuring the most effective operations possible.
- Fire fighters must be trained and certified by state and sometimes local authorities to provide one of the three levels of EMS: (1) basic medical care and rescue and extrication, (2) BLS, or (3) ALS.
- To retain and enhance their role in EMS delivery, fire departments must be creative, within the constraints of local, state or provincial, and federal law, in their financial approaches.
- Fire officers must be proficient in specialized forms of rescue, which frequently require unique equipment and skills.
- To prevent emergency incidents involving hazardous materials and to respond to such emergencies, fire officers must understand the diverse nature of hazardous materials and the laws and regulations governing their use.
- Although fires and emergencies involving aircraft operations infrequently occur, fire department personnel must be trained to know and understand the various types of aircraft that might fly over their area, as well as the associated hazards and challenges of such incidents.
- To prepare for unexpected community disasters and emergencies, fire departments should network with the relevant agencies and private groups that respond to such emergencies.
- Properly implemented customer service can strengthen the relationship between fire departments and their communities, which may result in greater public support for fire departments during times of budget restrictions when cuts in resources need to be avoided.

Key Terms

Advanced life support (ALS) Technically complex medical services that are delivered by personnel trained to the paramedic level and include the administration of medications administered on the authority of a physician who is contacted by telephone or radio.

Basic life support (BLS) Medical services that are provided by EMT personnel who offer more than basic first aid; it uses EMS life support equipment such as oxygen, defibrillators, and other first aid materials.

Cardiopulmonary resuscitation A means of restoring or maintaining breathing and heart activity following a cardiac event; it is administered by fire fighters who have first response training and certification.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Legislation that defines "hazardous substances." It came to be known as the Superfund and identified procedures for reporting and responding to hazardous materials incidents. It also provides money to fund the cleanup of major hazardous waste sites.

Customer service A fire department approach to service that focuses on all the needs of the people who can be, and are being, served by fire department activities.

Dangerous goods A term used in Canada to describe substances called hazardous materials in the United States.

WRAP-UP

Emergency medical services (EMS) Critical medical interventions provided to the victims of life-threatening injuries and illnesses, or lesser trauma.

Emergency medical technician (EMT) A medical professional who is trained and certified by state and sometimes local authorities to administer EMS.

Environmental Protection Agency (EPA) A federal agency concerned with protecting the environment from all types of threats that might affect humans and animals.

Extremely hazardous substance A chemical that has been listed by the EPA as possessing properties that are extremely hazardous to a community during an emergency spill or release.

Federal Water Pollution Control Act Legislation that gives the EPA and the U.S. Coast Guard the authority to control the release of oil and other hazardous substances that could pollute the marine environment.

Hazardous chemical A chemical that is a health, flammability, and reactivity risk to employees who may be exposed to them in the workplace.

Hazardous material Any material that poses a risk to safety and health and property when transported in commerce.

Hazardous substance Any substance that poses a threat to waterways and the environment when it is released into the atmosphere or a body of water.

Hazardous waste Discarded materials regulated by the EPA for health and safety reasons.

Hazardous Waste Operations and Emergency Response Operations A regulation that spells out requirements for fire department operations during emergencies involving hazardous materials and hazardous wastes.

Marine pollutant A material designated as having a negative impact on the waterways.

Paramedic A medical technician with a higher level of competence in both medical knowledge and medical techniques and skills than EMTs.

Resource Conservation and Recovery Act (RCRA) Legislation that authorizes the EPA to regulate hazardous waste, including solid waste and medical waste, as well as underground storage tanks.

Superfund Amendments and Reauthorization Act of 1986 (SARA) Legislation that revised the original Superfund law (CERCLA) to provide for a stronger response to emergencies involving released hazardous materials.

Toxic Substances Control Act Legislation that gives the EPA responsibility for developing a uniform listing of all chemical substances and criteria for prohibiting or limiting the manufacture, processing, use, application, and concentration of such chemicals.

Case Study

You have been assigned to the disaster response planning team for your fire department. Your team will work with community officials to create a community-wide emergency plan. The mayor wants to meet with your department's committee during the week prior to a public forum at the high school gymnasium. Your team is eager to meet with her to discuss creating a comprehensive disaster response plan that covers the fire department's role as well as the role of other agencies, community leaders, and the citizens of the community. Your team will also present ideas to the mayor for educating and involving the community in disaster preparedness.

1. Your department understands that specific-disaster response planning is _____.

A. practically impossible because of the variety of potential disaster types and the vast range in the severity of outcomes
B. the best way to be certain that all contingencies have been determined and that the plan is complete and will be successful
C. necessary as mandated by the Federal Emergency Management Agency (FEMA) in order to meet federal guidelines
D. only required by densely populated districts that are also considered high-risk for natural disasters or targets for potential acts of terrorism

2. NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity Programs,* establishes _____ for disaster management for the private and public sectors in the development of a program for effective disaster mitigation, preparedness, response, and recovery.

A. federal mandates
B. state or local alternatives
C. jurisdiction-specific requirements
D. minimum criteria

3. The Office of Grants and Training at the Department of Homeland Security provides _____ to states and local jurisdictions for preventing, deterring, and responding to incidents involving terrorism and weapons of mass destruction.

A. general information
B. limited education
C. tailored training
D. no specific help

4. Your committee understands that assisting in the development of community-wide emergency preparations is_____.

A. done to appease the public
B. the politically advantageous choice
C. an important fire service function
D. a means to get more fire department funding

WRAP-UP

Review Questions

1. Discuss the meaning of customer service, as it applies to fire departments.
2. List the new range of services provided by fire and rescue organizations.
3. What are the challenges associated with special rescue operations?
4. What are the components of emergency medical services and the qualifications for each level of care?
5. How do hazardous materials affect the management of an incident?

Discussion Questions

1. If you are not already familiar with the training and certification requirements for EMT and paramedic work, obtain that information and become acquainted with it. Determine where and how the training and certification can be obtained.
2. Review information available in your department regarding which hazardous materials you might encounter in your district and in districts and departments where you might provide mutual aid services. Prepare a list.
3. Review the hazardous materials on the list you prepared in question 2, and then prepare a page for each one that gives the following information:
   - Special protective equipment that may be required when encountering that material
   - Extinguishing or neutralizing materials that would be needed for that hazard
   - Aid that would have to be rendered to citizens exposed to the material
   - Other precautions that need to be observed
4. Prepare a list of all agencies and private groups, with telephone numbers, with which your department is, or could be, in contact to plan for disaster emergencies. If your department has no formal plan with such contacts, then prepare a list, with telephone numbers, of all agencies and private groups that should be, or could be, contacted for joint planning or that could be called on in an emergency.
5. Review the meaning of the term customer service as it is used in your department. Determine what nonfire-related services your department offers to the community. How else might the customer service concept affect what your department does for the community and how it performs its core services?
6. Prepare goals, objectives, and guidelines for three of the services listed at the beginning of this chapter, with emphasis on those provided by your department.

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