Organizing the Response

Chapter Contents

chapter 5

Key Terms

NFPA® Job Performance Requirements

This chapter provides information that addresses the following job performance requirements of NFPA® 1006, *Standard for Technical Rescuer Professional Qualifications (2013)*.

5.2.2

5.2.4

5.2.7

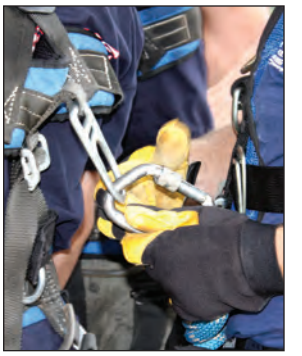
Organizing the Response

Learning Objectives

After reading this chapter, students will be able to:

1. Describe the assessment phase of the rescue incident. (5.2.2)
2. Explain ways to develop an Incident Action Plan.
3. Describe ways to implement an Incident Action Plan. (5.2.4)
4. Identify aspects of terminating a rescue incident. (5.2.7)
5. Learning Activity 5-1: Practice interviewing witnesses as part of an initial assessment for developing an Incident Action Plan. (5.2.2)
6. Learning Activity 5-2: Explain types of tasks and assignment responsibilities of rescue group personnel. (5.2.4)

Chapter 5
Organizing the Response



Case History

A 33 year veteran volunteer firefighter lost his life after climbing down a sewer manhole in an attempt to rescue a utility worker. A low oxygen environment and inhalation of sewer gases were listed as the causes of death. The National Institute for Occupational Safety and Health (NIOSH) investigated the incident and provided the following details.

A utility worker entered a manhole behind a fire station to clear a sewer backup. The victim firefighter and another firefighter were at the station to assist during the process. The fire chief also arrived and moved fire apparatus out of the station so that arriving utility apparatus would not block their exit in case of an emergency.

The utility worker fell unconscious in the manhole and the victim firefighter entered to assist without any personal protective equipment. He also fell unconscious inside the manhole. The utility worker and victim firefighter were eventually removed and pronounced dead at a local hospital. The medical examiner reported the cause of death as asphyxia due to low oxygen and exposure to sewer gases.

Because of the following firefighter failures, a firefighter and utility worker both lost their lives at this incident because they did NOT:

- Develop an Incident Action Plan.
- Understand the hazards at the scene.
- Have standard operating procedures in place for confined space rescue.
- Wear appropriate personal protective equipment.
- Deploy an effective Incident Management System.

Source: http://www.cdc.gov/niosh/fire/reports/face201031.html

Technical search and rescue responses must be organized and coordinated to ensure a successful and safe outcome. This effort requires the use of an Incident Management System (IMS) and the creation of an Incident Action Plan (IAP). The value of the IAP depends on the accuracy and relevance of the information upon which the plan is based. This chapter addresses the organization of a response to a technical search and rescue incident, divided into four phases that include significant activities of each phase. These phases may not have a readily identifiable beginning and end point, and aspects of each phase may overlap:

- Phase I: Assessing the Rescue Incident
- Phase II: Developing the Incident Action Plan
- Phase III: Implementing the Incident Action Plan
- Phase IV: Terminating the Rescue Incident

Phase I: Assessing the Rescue Incident

All of the information gathered during the initial and ongoing assessments confirms the nature and extent of the rescue situation and helps the Incident Commander (IC) develop and finalize the Incident Action Plan (IAP). The information also helps the IC make one of the most important decisions affecting the plan of action: whether it is reasonable to think that the victims are alive and that the operation should be conducted as a rescue or that victims could not be expected to have survived and that the operation should be conducted as a body recovery. The assessment of the incident must include information additional to the physical condition of the incident environment. Resources that provide useful information include witness testimonies and existing maps and charts. Deciding the **mode of operation** will set the tone for the entire response.

Mode of Operation — In a search and rescue incident, the two modes are Rescue or Recovery

Simultaneous Operations

Actions assigned to one incident phase may overlap with actions taking place in a later phase. For example, personnel may access, treat, and move victims outside the incident area while the Incident Commander (IC) develops the IAP. Although the activities associated with assessment, IAP development, implementation, and evaluation are associated with different incident phases, they may occur simultaneously.

Incident Assessment

The incident assessment process begins before the initial dispatch and continues perpetually through the completion of the incident. An inadequate or inaccurate understanding of an incident is a frequently cited cause of responder injury or death. The following sections explain details that must be considered throughout an incident.

Initial Assessment

The initial assessment process begins before the initial dispatch and continues during response and arrival. While en route to the incident, responders should review the following information to develop an IAP:

- Preincident surveys
- Dispatch report
- Time of day
- Weather
- Location
- Known hazards

As responders conduct the initial assessment of the incident, the area around the structure should be cordoned off to protect both responders and the public from the hazards present at the incident. The features of the control zones will depend on the size, nature, and complexity of the rescue situation. The presence of secondary hazards may affect the boundaries of the zones.

Technical rescue activities generally begin with a search to locate trapped victims. An effective and efficient search effort requires a plan that is developed based on the facts of the incident and the ability of responders on scene. A preincident plan, if available, will be a valuable resource to rescuers throughout the incident. This plan may be available to the IC in hard copy or electronically through an apparatus-mounted **mobile data terminal (MDT)** or **mobile data computer (MDC)** (**Figure 5.1**). At locations where a preincident survey has not been completed, responders are required to rapidly develop essential information necessary for successful mitigation of the incident.

Mobile Data Terminal (MDT) — Mobile computer that communicates with other computers via a radio system.

Mobile Data Computer (MDC) — Portable computer that, in addition to functioning as a Mobile Data Terminal, has programs that enhance the ability of responders to function at incident scenes.

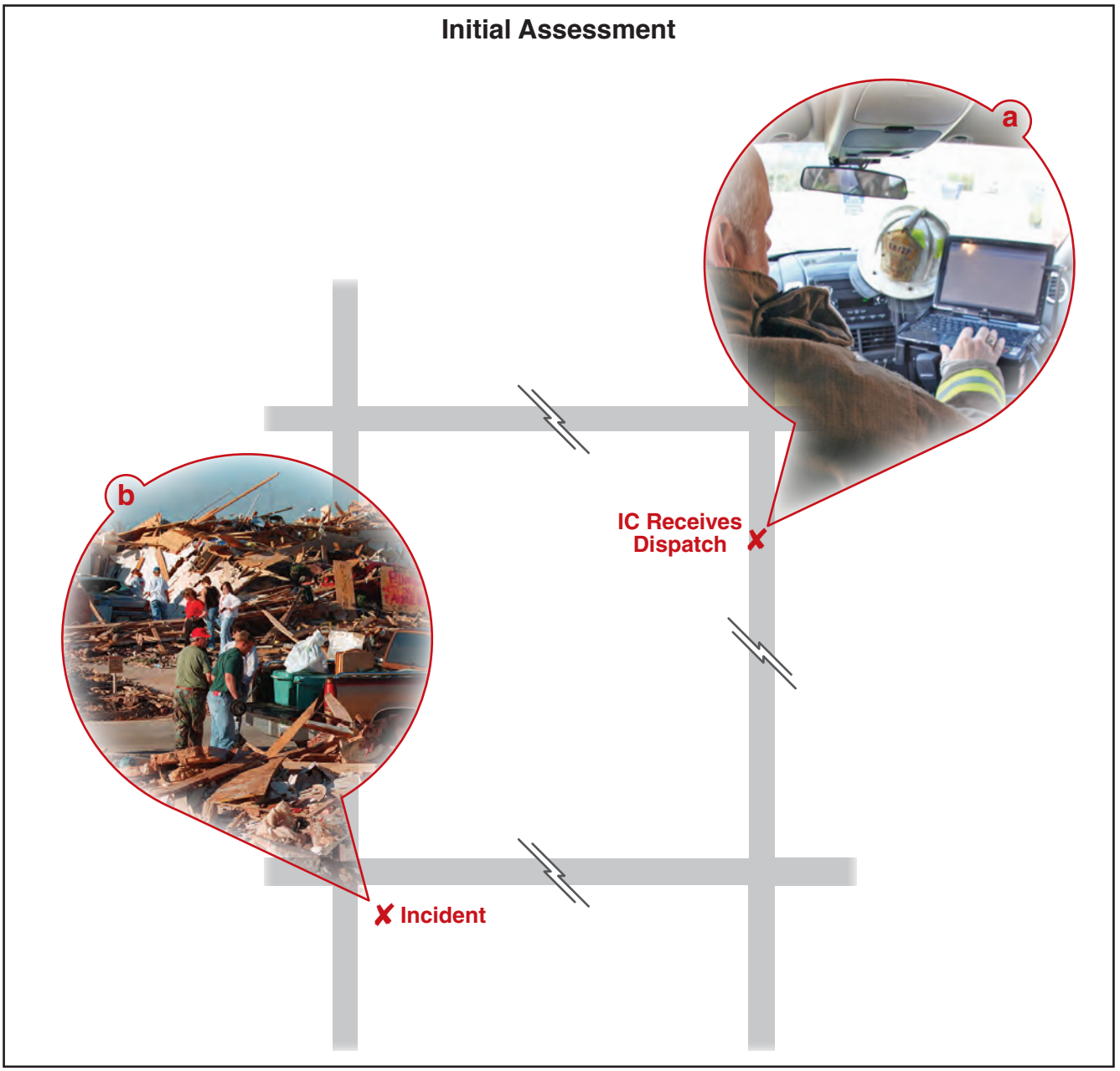


Figure 5.1 Initial assessment includes review of the dispatch report and any other known information. *Photo b Courtesy of FEMA News Photo.*

Reconnaissance — Process of examining an area to obtain information about the current specific situation, probable fire behavior, and other information related to fire-suppression.

Ongoing Assessment

All of the information gathered during the initial assessment helps the IC to finalize the IAP and helps the IC finalize the Incident Action Plan. The ongoing assessment includes **reconnaissance** of the scene to gather information about the physical characteristics of the incident scene, obvious or anticipated hazards and challenges, and the location and condition of any victims. All information gathered during both the initial and ongoing assessments helps identify possible tactical solution to meet the incident's objectives. The ongoing assessment should continue throughout the duration of the incident and every responder has an obligation to communicate information that is tactically or strategically significant through the chain of command.

CAUTION

All personnel involved in reconnaissance activities must wear personal protective equipment that is consistent with anticipated hazards.

All personnel should continuously monitor the incident scene and operations area for safety hazards and report any findings through the chain of command. Access to the scene should be controlled as much as possible, though this control may be difficult given the scope of many rescue incidents.

Updated information obtained during the ongoing assessment should be evaluated and the IAP should be modified to reflect the current situation. Before committing resources to hazardous tactical activities the Incident Commander should conduct a risk-benefit analysis. As always, the risks that responders are exposed to should be commensurate with the expected benefits and all operations should be conducted within the framework of the IAP. One critical aspect of the ongoing assessment is ensuring that the responders are aware of the risks and hazards that are (or may be) present at the scene.

Ongoing assessment aids the IC in the determination of whether the operation will be conducted as a rescue or a recovery. A recovery operation should be conducted slowly and methodically, taking no unreasonable risks, and coordinated with the appropriate investigatory authorities having jurisdiction.

Interviewing Witnesses

After arriving at the incident scene, responders should implement an Incident Command System and attempt to identify any witnesses. Witnesses should be interviewed at the location where they last saw the victim, if possible. In the event that the witnesses are not able to be interviewed face-to-face, responders should use whatever means possible, whether contact over a phone or dispatcher relay, to get the necessary information. Answers to the following questions will help responders during the search:

- How many victims are there?
- Is the victim's name known?

- Is the victim visible, or is his or her exact location known? Where was the victim last seen?
- Are multiple victims in the same location?
- Is the victim injured, trapped, or stranded? How much time has passed?
- Is the victim conscious? Can he or she communicate?
- Does the victim have his or her own safety equipment? What equipment?
- What clothing was the victim wearing?

Bystanders and witnesses familiar with the area may be able to offer further information including:

- Circumstances that preceded the incident
- Incident site layout/design
- Location of hazards, utilities, and access points

This information helps rescuers in two important ways. First, the answers validate the dispatch report and confirm the need for rescue operations. Second, they aid in the determination of whether the resources on scene or en route will be adequate for responders to address the situation, or whether additional resources must be requested. The decision must be made quickly for resources to arrive in time to be useful.

If the location of victims is unknown, rescuers should carefully survey the area for clues that may provide likely locations for starting the search. These clues may include clothing, water bottles or food wrappers, and tools.

Rescuers can use the following checklist to complete an initial assessment of a rescue incident:

- Identify and interview witnesses.
- Obtain and examine any entry permit.
- Contact victim (if possible).
- Evaluate and verify what has been and is being done.
- Weigh risks versus benefits of available options.
- Evaluate effectiveness of initial response.
- Contact any expert assistance needed.

If not already accomplished, formal command of the incident should be established and development and revision of the IAP should continue as more additional information and resources become available. For incidents that are expected to last for an extended period of time, an updated weather forecast should be requested. Responders at the scene (or dispatchers) can often contact the weather service to receive current forecasts for their specific location.

An important component of the assessment phase involves locating and interviewing witnesses to the incident. Large numbers of spectators may be present at the emergency scene and an early effort must be made to identify spectators who are actual witnesses or who have useful information for responders. Even though most witnesses are eager to come forward and tell someone what they saw, it is still worthwhile to ask the assembled crowd if anyone saw what happened.

A member of the responding agency should be assigned to locate witnesses and to stay with them until such time as they will no longer be called upon to provide information. In addition to isolating witnesses from other spectators, they should be isolated from each other whenever possible. Experience has shown that if witnesses are allowed to congregate and discuss what they saw, some witnesses may be influenced by others and change their stories to match what they heard.

Rescuers should be sensitive to people's feelings in these stressful situations, and they should always maintain a calm, professional manner. Rescuers should speak calmly, asking clear, concise questions. When dealing with the family, rescuers should refer to the victim by his or her first name and always be honest with the family about what is being done. However, even when asked, rescuers should refrain from speculating about the eventual outcome of the operation.

Competent Person — A person with the ability and authority to identify and address hazards in an environment.

For incidents occurring at industrial facilities or job sites, rescuers should locate a representative of the business or **competent person** who can answer questions about the incident and potentially offer feedback on proposed actions. Industrial facility representatives provide information about products, processes, or other hazards that may affect rescue or recovery operations. The competent person at a job site should be able to provide specific information regarding the nature and type of work that was being performed before the incident, which are both factors that may affect and influence the development of the IAP.

When interacting with witnesses, the following guidelines will help responders conduct effective and professional interviews:

- Ask all witnesses for identification, including information on how they can be reached in case they need to be called back to the scene.
- Consider witnesses credible and use their information.
- Interview small children gently and at eye level.
- Separate witnesses from each other during questioning to avoid them being influenced by each other.
- If necessary (and safe), ask each witness to take rescuers back to the exact point from which they last saw the victim.
- If there are a number of witnesses, conduct separate interviews simultaneously.

The following is a sample list of questions which, depending on the nature of the incident, may be included in the witness interview:

- How many victims are there and what are their names?
- Is their exact location known?
- Are they injured, trapped, and/or stranded?
- Are they conscious, and if so, can they communicate?
- Where were the victims last seen?
- How much time has elapsed since the victims were last seen or the incident started?
- What were the victims wearing? Specifically: type and color of clothing and PPE.

- What has been done so far?
- Have all other occupants or workers been accounted for?
- Can the victims' coworkers or friends be interviewed?
- What was the nature of the work being done and are there any potentially hazardous materials or processes involved?

When rescuers carefully document the recollections of each witness, they can begin to develop a profile of the victim or victims that will assist in the development of the IAP and subsequent search operations. The point at which a victim was last observed can be marked on a map or sketch of the incident scene and may serve as a logical starting point for a victim search. Information from multiple witnesses may be plotted on the map in order to provide likely locations for searching.

NOTE: Additional practice for interviewing witnesses at an incident is included in **Learning Activity 5-1**.

Maps and Charts

Maps and charts are extremely useful reference materials for planning and conducting technical search and rescue operations of all types and magnitudes. Even on small incidents, maps assist rescuers with the initial approach and access to the incident scene. During large scale events, maps help identify and describe search parameters. Most rescuers are familiar with, and may use, road maps on a regular basis, but other types of maps used in the search and rescue environment are not encountered as frequently. The following sections describe maps and mapping techniques that can be used at a wide variety of incidents.

Topographic Maps

Topographic maps use contour lines to show the elevation, slope, and other features of the land including peaks, ridges, and drainages **(Figure 5.2, p. 148)**. In addition, these maps typically include roads, trails, cities, rivers, and lakes and are useful for identifying the best location to place spotters for locating victims and lookouts for increasing rescuer safety.

Each contour line on a topographic map represents a constant elevation on the ground surface so that all points on the same contour line are the same elevation. Contour lines that are close together mean that there is little horizontal distance between two adjacent elevations — so the slope is steep. Conversely, contour lines that are farther apart indicate that the slope is relatively flat. Contour lines form concentric circles, ovals, or irregular closed loops to represent peaks and hilltops.

River Maps

While topographical maps show terrain features near a river or lake, only limited information is typically provided about the body of water. Commercially produced maps of rivers that identify and describe significant features such as rapids, waterfalls, and access points may be available for rivers that

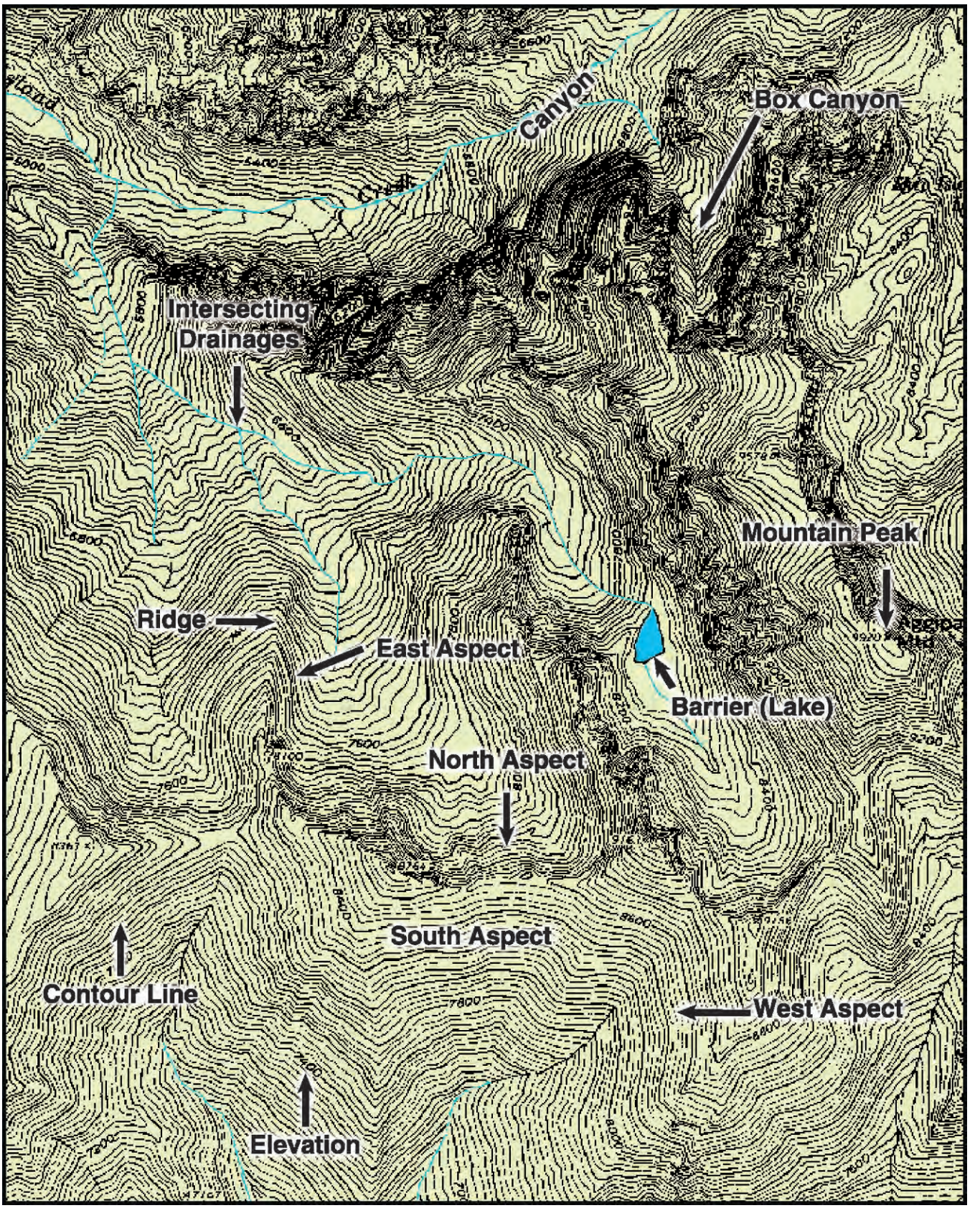


Figure 5.2 Contour maps use lines to represent changes in the elevation level.

are popular with recreational floaters. Organizations with rescue responsibilities for a particular river may produce a map that shows locations that are operationally significant:

- Kayak or motor boat launch points
- Landing zones
- River distances
- Dams or other hazards
- Anchor points for rescue systems

Area Mapping

Mobile data computers in many jurisdictions have mapping software and Geographic Information Systems (GIS) data in them. Many MDCs have integrated **global positioning system (GPS)** information that allows responders to track their location in relation to a map. In addition, these MDCs often have satellite or aerial imagery that is very useful for identifying locations and numbers of damaged buildings. Other agencies may have detailed street and neighborhood maps that can serve as a template for organizing technical search and rescue operations. When combined with handheld GPS units these maps can be extremely useful.

Global Positioning System (GPS) — System for determining position on the earth's surface by calculating the difference in time for the signal from a number of satellites to reach a receiver on the ground.

In structural collapse incidents involving a number of buildings, rescuers may have few traditional markers to consult while mapping the area. For example, an entire block that has been hit by a tornado may not have any doors or house numbers intact. In these cases, rescuers must map the area in order to provide a working blueprint for themselves and other teams of rescuers **(Figure 5.3, p. 150)**. The standard system for locating a building on any block is as follows:

- Use existing numbers and fill in unknown areas.
- If no numbers are known, keep the numbers small and maintain even and odd sides of the street.

NOTE: After large incidents, FEMA may activate US&R task forces to aid in this work.

Global Positioning System Devices

Global positioning system (GPS) devices receive transmissions from multiple satellites to accurately pinpoint the device's location. While these devices are commonly handheld, others are incorporated into an emergency vehicle's mobile data computer (MDC). GPS receivers indicate the unit's precise latitude, longitude, and altitude and are particularly useful for determining the coordinates of incident facilities such as landing zones. Coordinates can be transmitted to incoming air assets in a format that allows pilots to accurately navigate to the correct location.

Marine Charts

Governmental agencies produce marine charts for many bodies of water, both large and small. These charts frequently include depth soundings (essentially the underwater topography of the area) and names of significant features such

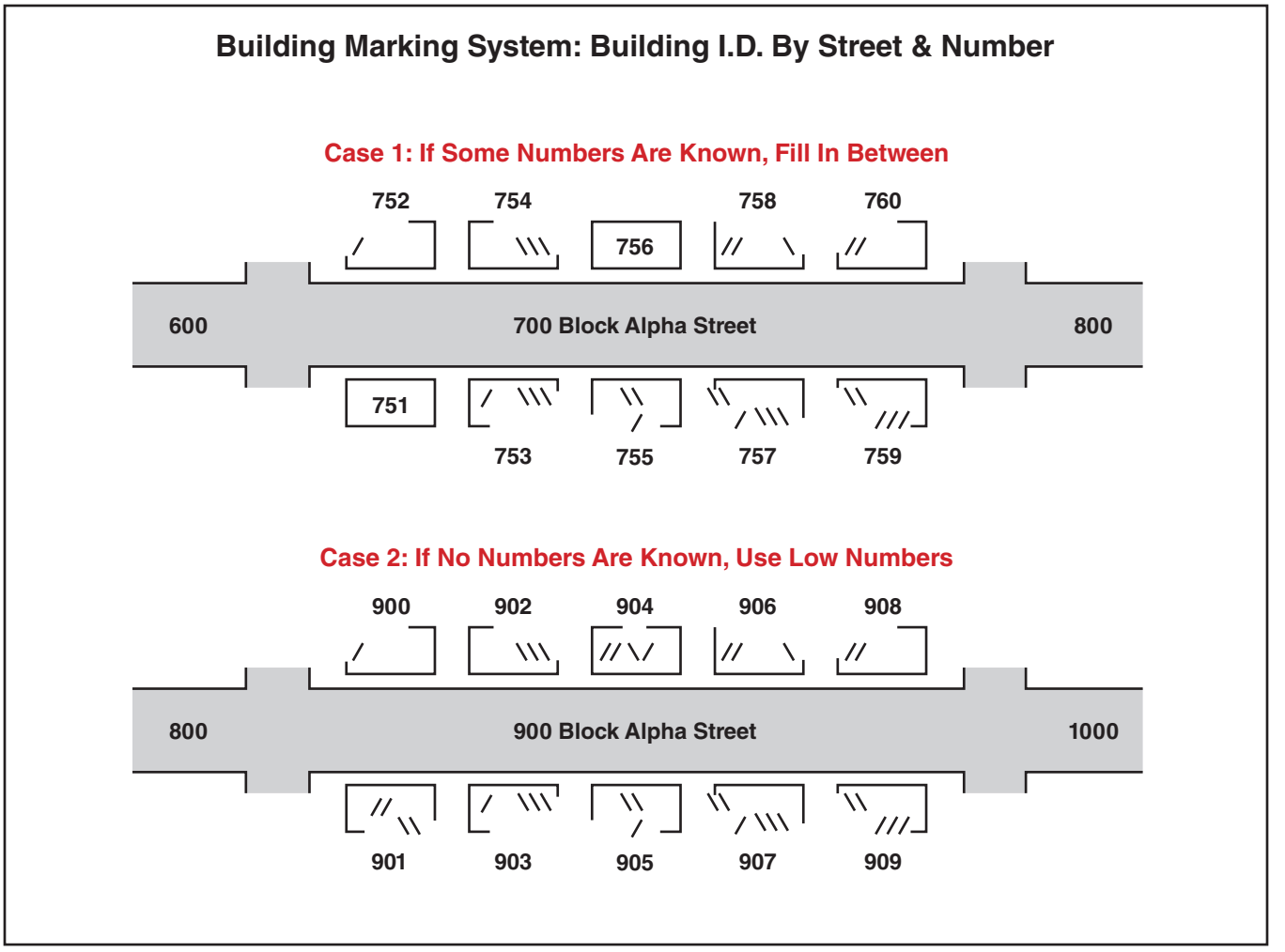


Figure 5.3 After incidents that damage and destroy a large number of structures, rescuers may need to develop a map to help keep track of the operation.

Hydrologic Data — Information related to the movement of currents and tides in bodies of water.

Track Traps — Areas which, from their nature or location, are likely to provide evidence of victim movement. For example, a muddy riverbank may allow shore-based rescuers to see footprints left by a victim who self-rescued and left the water.

as bays, inlets, points, and reefs. Charts for coastal and larger inland waters will include the location of navigational markers and beacons. Many of these charts are available in a format that is usable with GPS devices and MDC/MDT.

Marine charts, especially for coastal areas, should be used in conjunction with **hydrologic data** that provides information on currents and tides. Charts and tables can be consulted to determine the most likely areas to search for victims in the water. This systematic identification of high likelihood area for victim detection allows search resources to be deployed in the most efficient manner. Additionally, **track traps** can be identified on the charts that may allow shore based rescuers to determine if victims have come ashore on their own. Another type of dynamic information that is important to rescuers in the marine environment is wave height, which will affect watercraft operations and may impede the ability to visualize victims in the water.

Blueprints and Site Plans

Blueprints and site plans are resources that may be available to assist responders in urban or industrial areas. At the scene of structural collapses, blueprints are invaluable for determining probable survivable spaces which will assist responders in developing a search plan. During responses to industrial areas,

site plans are essential in the planning process for determining access routes and identifying potential hazards. Printed blueprints may be available from city or county planning departments. Blueprints may be available in digital format as well, especially for new construction or recently built structures. Site plans can often be obtained from facility representatives who can also assist with interpreting the information found on these documents.

Infrastructure Plans

Infrastructure plans show the location of underground power and communication cables, water mains, sewer lines, and other infrastructure. An infrastructure plan that shows the location of tunnels and vaults will assist in identifying access points and search locations during a confined space rescue and will help identify possible hazards in many other environments. Infrastructure plans are often available from utility companies, wastewater treatment agencies, and other governmental or private entities that manage infrastructure.

Phase II: Developing the Incident Action Plan

Preparation for rescue operations is an intrinsic aspect of the response. The length of the pre-entry phase may range from a few minutes to several hours. During this time, the following resources must be checked for completeness so the rescue operation may be completed as safely as possible:

- Incident Action Plan specific to the rescue environment
- Incident personnel and positions
- Resource requirements
- Communications

Incident Action Plan Specific to the Rescue Environment

Information gathered during the initial and ongoing assessments should be used to formulate or modify an IAP. The completed IAP should reflect the complexity of the incident. On smaller, less complex incidents, the plan may not be written. However, the IC must ensure that all responders understand and operate within the confines of the plan. Large or complex incidents may necessitate a written IAP that incorporates many of the forms described in Chapter 5.

Regardless of the format of the IAP, the IC must ensure that all responders understand and operate within the confines of the plan. While the original plan should be flexible enough to accommodate a certain amount of unexpected factors, a backup plan should be available in case unforeseen complications invalidate the original plan.

After the Incident Commander has gathered enough information to have a working understanding of the circumstances surrounding a technical search and rescue incident, he or she can establish the strategic goals for the incident. An Incident Action Plan should then be developed that outlines the tactical actions that will be taken in support of the strategic goals. Although a small, relatively simple rescue operation may not require the development of a written IAP, there must be a plan of some type. On larger, more complex operations the

plan should be in writing and reflect an Incident Management System (IMS). In either case, the IAP must be communicated through the chain of command to everyone involved in the operation.

The IC determines the overall strategy for mitigating the incident and establishes the tactical objectives for meeting the strategic goals. The written IAP reflects these tactical objectives and strategic goals and outlines the tactical and support activities required to control the incident. If the incident will last for an extended period of time, an IAP may be developed that recognizes the need for dividing the incident into specific time intervals, known as **operational periods**. The length of the operational periods may vary depending on the nature and complexity of the technical search and rescue incident. ICs should anticipate the need for additional resources on extended or complex incidents where responders will need rest and rehabilitation.

Operational Period — Period of time scheduled for execution of a specified set of operational goals and objectives as identified in the Incident Action Plan (IAP). An operational period may be 12 hours, 24 hours, or any other arbitrary amount of time. A new IAP is created for each operational period.

ICS Forms

To facilitate the development of the IAP, the National Incident Management System (NIMS) has created tactical worksheets for the collection of information. Written IAPs usually contain most, or all, of the following elements which are documented in writing by completing the appropriate ICS forms **(Table 5.1)**. Additional information on the development and use of ICS forms can be found in the Fire Protection Publications, National Incident Management System Consortium *ICS Model Procedures Guide*.

While the original IAP should be flexible enough to accommodate a certain amount of unexpected information, ICs may also formulate a backup plan in case something completely unforeseen occurs to invalidate the IAP. If the information gathered during the initial and ongoing assessment was somehow inaccurate or misleading, or if some subsequent event changes the situation significantly, a secondary or backup plan should be ready for implementation. At a minimum, the IAP should reflect the possibility that rescuers may need to be rescued themselves.

Incident Management Team (IMT) — The IC and appropriate Command and General staff personnel assigned to an incident. IMTs are generally grouped in five types. Types I and II are national teams, Type III are state and regional, Type IV are large department specific, and Type V are for smaller jurisdictions.

Incident Management Teams

Some organizations have sufficient resources to staff a team entirely from within; in other communities teams may include members from a number of different agencies. Many states, provinces, and other governmental and private entities have **Incident Management Teams (IMT)** that are available to respond to a major incident within the state (or adjoining states through contractual agreements). In the United States, the federal government sponsors IMTs that are available to respond to incidents of national significance. These teams provide resources and capabilities that are not typically used on smaller incidents, but are essential for successful operations at larger incidents.

Some of the functions that can be provided by incident management teams include:

- Command support provides a trained public information officer (PIO)
- Operational support provides qualified division or group supervisors
- Planning support develops IAPs for future operational periods

Table 5.1
ICS Forms

Type of Information	ICS Form Number	Description
Incident Objectives	ICS Form 202	Objectives to be achieved in the specific time interval
Organizational Assignments List	ICS Form 203	ICS table of organization, including units and agencies
Assignments List	ICS Form 204	Tactical assignments divided by branch, division, and group
Incident Radio Communications Plan	ICS Form 205	Radio channel assignments for use during the incident
Medical Plan	ICS Form 206	Location, staffing, and resources available to the incident medical aid station including types and locations of ambulances, and contact information for hospitals
Operations Planning Worksheet	ICS Form 215	Resources available, tactical assignments, and resources that may be needed during the operational period
Safety Analysis	ICS Form 215A	Safety concerns that should be monitored during tactical operations; should accompany ICS 215 and contain similar information

- Logistical support arranges sleeping and eating accommodations for responders
- Administrative support tracks incident finances and managing resource contracts

Incident Personnel and Positions

A Rescue Group may be created within the ICS/IMS structure to improve the **span of control** at the incident and clarify responder roles **(Figure 5.4, p. 154)**. Additional assignments are made within the rescue group according to incident needs. Personnel who will perform the actual rescue must be identified, along with those who will work in direct support of the rescue objectives.

Span of Control — Maximum number of subordinates that one individual can effectively supervise; ranges from three to seven individuals or functions, with five generally established as optimum.

NOTE: Jurisdictions may identify and fill key positions before arrival at an incident. This coordination may occur at the start of a shift or during the response.

The creation of a rescue group to manage the tactical operation allows the Incident Commander to focus on strategic issues. Qualified personnel must fill key management and tactical positions. Other specialized positions will enable trained personnel to oversee technical operations.

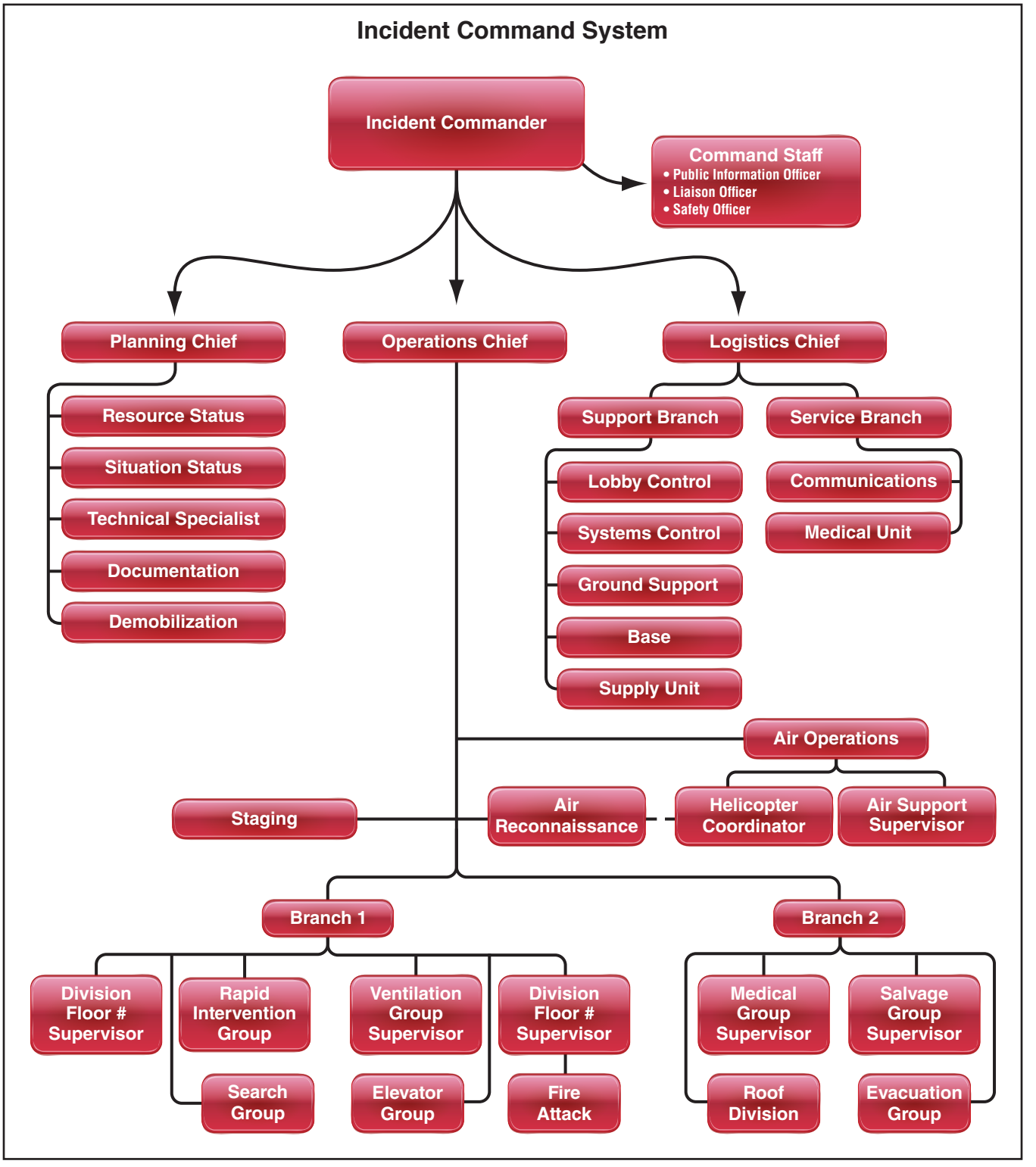


Figure 5.4 The Incident Command Structure can include the addition of a Rescue Group when needed.

Rescue Group Supervisor

The rescue group supervisor is responsible for supervising and directing the actions of the rescue group and should avoid direct involvement in the rescue activities. He or she should coordinate and direct all actions toward achieving objectives established in the IAP. The rescue group supervisor should have at least the same level of qualification as the members of the entry team. In

order to effectively manage his or her assigned resources, the rescue group supervisor must be able to communicate with each tactical resource. In addition, communication should be established with other resources that may be operating in support of the operation.

Assistant Safety Officer – Rescue

Any time rescue personnel or victims are exposed to the hazards of a rescue, an incident safety officer (ISO) should monitor the operation for any unsafe conditions or practices. At more complex incidents where an ISO is tasked with overall scene safety responsibilities, one or more Assistant Safety Officers – Rescue should be identified to monitor the rescue operation. The Incident Safety Officer and/or Assistant should be qualified to the level of complexity of the incident. **An Incident Safety Officer or Assistant Safety Officer - Rescue should be involved in all aspects of a rescue.**

Rescues are often very labor intensive and time consuming. Before entering the rescue environment, all entry team, back up team, and search team members should be evaluated to ensure that they are mentally and physically prepared for their assignments. This evaluation may simply consist of obtaining baseline vital signs such as pulse, blood pressure, and body temperature. If any team member is determined to not be physically or mentally capable of performing the assignment, he or she should be replaced in that task.

Team members must also be informed of any known hazards, mitigation steps, and any conditions that are likely to produce psychological or emotional stress in the rescuers. Entrants must understand their objectives and make sure their activities align with the IAP.

Entry and Back Up Teams

Entry and back up teams must be comprised of properly trained and equipped personnel. Both teams must be large enough to meet the requirements of the incident while minimizing the number of entrants. For extended operations, trained and equipped responders may be added to a personnel rotation.

Before entering the hazard environment, the equipment needed for the anticipated rescue should be organized. Responders should also have access to equipment that would aid in self-rescue or other plausible complications. When more than one rescuer is to be deployed, a team leader should be identified. Each team member's equipment must be confirmed before initiating the rescue actions **(Figure 5.5)**.

Figure 5.5 Equipment that must be checked before entering a rescue environment includes safety line connections.

In addition to protective clothing and respiratory protection, each entry and backup team member must be fitted with some form of retrieval system except in cases where an entangled line will increase the overall risk or if the line would not contribute to the rescue of the entrant. The specialty chapters will discuss this phenomenon where relevant.

When entrants are inside a rescue environment, an attendant must be staged near the outside perimeter of the rescue environment to perform the following tasks:

- Monitor the entrance for authorized entry
- Check entrants' equipment
- Advise entrants of the environment's current conditions
- Relay requests/information from the entry team

Rope Team

Support for the entry team will often include rope systems to provide safety for entry team members, often at a ratio of one rope tender for one entry team rescuer. Additional tenders can be added as necessary. Additionally, rope teams may be needed to establish and maintain rope systems that facilitate the removal of a victim from a hazard area. The rope team should evaluate the situation and work with the rescue group supervisor and entry team to ensure that the overall system supports the IAP throughout the course of the incident.

Search Teams

One or more teams may be assigned to search the rescue environment to identify likely victim locations. These teams search using tools and techniques described in Chapter 6, Search Operations. The teams must maintain communication with other teams. Because of the difficulty of search activities, team members should be rotated through the job positions and rehabilitation as often as needed and possible. Additional teams may be added as necessary and available.

NOTE: Additional practice for identifying responsibilities of rescue group personnel is included in **Learning Activity 5-2**.

Resource Requirements

Incident resources include personnel and equipment, and both are critically important to the success of an incident. The best equipment will not help personnel too few in number or insufficiently trained. Likewise, the most highly trained and motivated rescuers will not be able to do what is necessary if they do not have the tools and equipment they need. In a case where personnel or equipment available are insufficient, or the wrong type, to meet the requirements for the rescue at hand, the Incident Commander (IC) must request additional resources as soon as possible. Resources that prove to be unnecessary for incident operations can be canceled while responding or returned to service from the scene.

The IAP offers a reasonable estimated number of personnel and type of equipment that are needed to complete incident operations in a safe and efficient manner. Necessary quantities of resources will vary according to the nature and extent of the incident; however, even a relatively simple rescue may require many responders with personal and team equipment. As the number of victims and the complexity of the rescue problem each increase, the number of responders needed increases and the IC should consider requesting additional qualified rescuers to meet any unanticipated needs.

The results of the initial and ongoing surveys should provide the IC with critical information on which to base decisions about what additional resources to request. Responders should have a plan in place for requesting any specialized equipment that may facilitate the successful completion of a rescue incident. Before allowing rescuers into an environment, the IC should ensure that needed resources and personnel are in place at the scene.

Communications

Effective communications often make the difference between success and failure. To accommodate failure of any single system, responders should have multiple methods of communication. Regardless of the actual mechanism of communication, responders should use a pre-established vocabulary and signals that all response participants recognize. All responders should understand the communication plan before being deployed into a tactical assignment.

The communication plan that is implemented for a rescue incident should match the needs of the incident and account for the features of the incident space. Communications may take the form of any of the following:

- **Direct voice communication** — Preferred whenever possible; miscommunication is greatly reduced with this communication style. May not be possible in all situations.
- **Portable wireless communication systems** — Includes radios, marine radios, cellular phones. Effective over long distances. May fail if the signal is blocked by terrain or other site features.
- **Hard-wired communication systems** – Effective over short distances. May be limited by the length of the transmission cord.
- **Nonverbal signals** — Includes a series of tugs on a lifeline, whistle blasts, or hand gestures. Effective where other systems may fail. May be easily misunderstood.

Use of Communication Devices

Responders must understand and use the accepted communication devices and systems approved by local and regional response agencies and the AHJ.

Signals may be used to communicate commands such as:

- Cease operations/all quiet
- Resume operations
- Evacuate the area

Phase III: Implementing the Incident Action Plan

Once all necessary incident assessment and pre-rescue operations have been completed, and a victim has been located, responders can initiate rescue operations. The following sections address aspects of a rescue may be supported, monitored, or conducted by a Level I rescuer throughout the operation. The

next step in this phase is to prepare the environment to be entered, and then to actually enter the environment. Those steps will be addressed in their respective specialty chapters. At all points throughout an incident, communications must be effective at all levels.

Personnel Accountability

The purpose of the accountability system is to ensure that only rescuers who are authorized and properly equipped are allowed to enter a rescue environment, and that both their location and their status are known as long as they remain in the rescue environment. The personnel accounting system should reflect the nature, size, and complexity of the incident. The IC should establish accountability before rescuers are assigned to hazardous operations. The ISO should verify that personnel accountability is in place and maintained throughout the incident. Some jurisdictions may assign an accountability officer who reports to the IC to manage this function.

In incidents where rescuers are close enough to be in constant visual and verbal contact with the attendant, the intent of the accountability system can be met with a minimum amount of information being recorded. A simple written list of the entrants' names and their entry and exit times may be sufficient.

A more formal system must be employed on larger, more complex incidents which require more personnel, when rescuers must use respiratory protection, or when they must work out of sight of the attendant. In these cases, the entrants' time of entry, any respiratory aid gauge readings, and their projected exit times must also be recorded as they enter the space. If the rescuer has not exited by the projected time, immediate action must be taken to locate and escort him or her out of the rescue environment.

As the IC (or IMT) develops and refines the IAP, resources need to be deployed in support of strategic goals and tactical objectives. Depending on the type of incident, some resources may be deployed immediately on arrival. In other cases, resources may be staged until the nature of the incident is more fully understood.

Personnel and resources arriving at the incident should be evaluated to ensure that capabilities meet the needs of the incident. Tactical assignments should be given only to responders with appropriate levels of training and equipment. Briefings should be thorough enough that assignments and expectations are clearly understood. A communication plan should be in place before any personnel are committed to a hazardous environment.

In many technical search and rescue incidents, assignments must be completed in a specific order. For example, air monitoring must be initiated before rescuers enter a confined space. The IAP must account for all of the actions that must be completed to successfully mitigate the incident and should anticipate any implementation order.

Ongoing Assessment

Though the IAP is now being implemented, responders must continually assess the incident. Feedback regarding effectiveness and outcome of assignments must be communicated upward through the chain of command to ensure that the IC maintains an accurate understanding of the incident. Informa-

tion regarding proposed alterations to the IAP can be transferred in a similar fashion. Though the IC has the final say on operational decisions, personnel operating at the tactical level can often identify opportunities or threats that are present in the incident, and ICs should be open to the possibility and value of such information. Because the actions needed to effectively implement a technical search and rescue IAP vary widely based on the type of incident, most of the remaining chapters of this book are devoted to the skills necessary to safely operate at various technical search and rescue incidents.

Victim Considerations in the Rescue Environment

Once the victims have been located, their medical condition must be evaluated. Victims overcome by a lack of oxygen or the presence of a toxic gas or vapor should be supplied with breathing air from spare equipment or removed from the space and into fresh air, as quickly and safely as possible.

NOTE: Chapter 7 will include details of responses that rescuers should be able to offer.

If possible in the space, any critical injuries or issues should be addressed before **packaging** for removal. In some cases, the position of the victim will dictate the method of removal. After victims are packaged, they can be removed from the environment, where they should be transferred to emergency medical services personnel for further evaluation and care.

Packaging — Readying a victim for transport. Packaging techniques may include dressing injuries, bracing vertebrae, and securing in a litter basket.

Phase IV: Terminating the Rescue Incident

At some point during a response, active rescue or recovery operations will cease and incident operations will shift to the termination phase. Though the nature of termination activities will vary according to the type of technical search and rescue incident, the following sections describe tasks that are common to most disciplines. Exceptions specific to each rescue environment are covered in their respective chapters later in this manual, or may be determined by the AHJ.

Decontamination

The possibility for exposure to hazardous materials exists at almost every technical search and rescue incident and equipment may easily become contaminated. At industrial sites, rescuers may encounter any number of chemicals or other materials that could have immediate or long-term health effects. Trench and structural collapse results in the disturbance of materials (such as asbestos or dust) and contents can even become airborne and spread throughout the surrounding area. Flooded areas may contain water that has been exposed to sewage or other contaminants. Contact with victims may expose equipment to blood or other bodily fluids that must be treated as infectious.

In the same way that victims and responders must be evaluated for contamination, equipment may also need to be decontaminated before being returned to service. Contamination must be assumed for any equipment that is exposed during the incident, and decontamination must be completed before that equipment is returned to service. While decontamination can generally be accomplished using soap, water, and a scrub brush, a hazardous materials team may be requested to advise on this process or assist with its completion. Additional information on decontamination can be found in the IFSTA manual, **Hazardous Materials for First Responders**.

Equipment Retrieval

Generally, equipment retrieval begins at the edge and then progresses away from the edge. Equipment that was used during a rescue should be carefully inspected before being place back into service. This guideline is particularly appropriate for equipment that may have been out of the visual range of responders, such as ropes lowered over the edge of a cliff.

Depending on the size, complexity, and length of time involved in the operation, the job of retrieving all of the various pieces of equipment used may range from very easy to very difficult and time consuming. Under some circumstances, it can also be quite dangerous. The danger involved in a retrieval operation may necessitate that equipment and other tools are left in place and recovered (if possible) in conjunction with debris removal operations. It is essential that all responders do not become complacent once the rescue has been accomplished.

Demobilization Unit — Functional unit within the planning section of an Incident Management System; responsible for assuring orderly, safe, and efficient demobilization of resources committed to the incident. *Also known as* Demob.

Identifying and Collecting Equipment

The process of identifying and collecting equipment assigned to the various apparatus on scene is much easier if each piece of equipment is clearly marked. It may be necessary for responders to conduct an inventory of their equipment before leaving the scene. If the operation was large enough to require the establishment of a **Demobilization Unit** (Demob), this unit will coordinate the recovery of loaned items, such as portable radios, and the documentation of lost or damaged pieces of apparatus and equipment.

Abandonment

In some cases, the environment within the technical rescue scene may be too hazardous to justify sending rescue personnel back to retrieve pieces of equipment — even expensive ones. Rather than putting personnel at risk, it is sometimes better to simply abandon the equipment in place. The abandoned equipment may be retrievable after the scene has been made safe, or the cost of replacing it may be recoverable from the property owner or a government agency such as FEMA.

Documenting the Incident

Every technical search and rescue incident should be carefully and thoroughly documented using each responding agency's incident reporting system. The purpose of documentation is to ensure that the actions and names of all responders are recorded. This information is critical in case the response is ever subject to legal review. Incident documentation can also be integrated into the postincident analysis process.

Postincident Analysis

In most jurisdictions, rescue situations are an infrequent occurrence. The responding agency should fully document these incidents to enhance the value of post incident analysis (PIA). Involved personnel should review each incident and the lessons learned should be documented. An effort should be made to include every involved agency in this process. If a relevant organization or individual cannot attend a meeting during the postincident analysis process, they can be contacted individually to obtain feedback.

The postincident analysis (PIA) is a valuable tool for improving efficiency and pinpointing areas for improvement. The analysis should be viewed as a growth opportunity and time for sharing information and must not be used to assign blame or accusations. The postincident analysis provides responding agencies with an opportunity to do all of the following:

- Promote personnel safety
- Evaluate the effectiveness of response
- Identify problem areas
- Determine and correct operational and training deficiencies
- Modify and improve operations at future similar incidents
- Recommend changes in building or zoning codes
- Assess the adequacy of SOP/SOGs
- Incorporate the analysis into training for future responders

The value of the PIA to the organization depends upon the quality of the information that is gathered during the process. Interviews and other research should be completed as soon as possible and the formal meeting should be scheduled to take place within two weeks of the incident if possible. In order for an incident critique to be successful, the postincident analysis must be supported by the top management of the emergency response organization.

The facility that is used to conduct the formal meeting portion of the PIA should have the space necessary to accommodate all participants and the materials and equipment necessary to facilitate an effective review. Map tables, dry erase boards, flip charts, and audio/visual equipment may all be useful during the review process. If the incident involved a multijurisdictional response, representatives of all the responding agencies, including telecommunicators, should be present.

The PIA process begins immediately following an incident and continues through the completion of the final report on the incident. Two aspects of the postincident analysis, the after action review and postincident report, are described in more detail in the sections that follow.

After Action Review

The after action review, sometimes referred to as a *tailboard critique*, is an informal process that happens before resources are returned to service and is helpful in identifying aspects of an operation that need to be addressed in the postincident analysis. Before leaving the scene, incident personnel should gather together to briefly discuss what went right and what could or should have been done better. Someone should be assigned to take notes to ensure that significant points are captured for inclusion in the PIA. In the event of

a responder injury or death, thorough documentation of the incident is an important aspect of the investigation process. Finally, if rescuers had to deal with victims who had suffered extraordinary injuries, debriefing should be made available to the rescue personnel.

NOTE: Critical incident stress debriefing is discussed later in this chapter.

Postincident Report

The IC is responsible for assigning someone to write a postincident report. In addition to standard operational issues, the report provides information on all aspects of the incident that involved safety issues. While the report writer may also be responsible for investigating and documenting any serious responder injuries or deaths, this function is typically carried out by another government agency.

Investigation

Though the concern for safety is paramount at any technical search and rescue incident, responder injuries or deaths may occur. Such events are typically investigated by federal, state, or provincial occupational safety and health organizations (OSHA, Health and Safety Commission) and other entities such as the agency's insurance carrier. In addition, any agency that experiences a **line-of-duty-death (LODD)** or injury during a technical search and rescue incident should conduct its own investigation to identify any policies or procedures that need to be amended or enacted to improve the safety of future operations.

Line-of-Duty Death (LODD) — Firefighter or emergency responder death resulting from the performance of fire department duties.

Control and Release of the Scene

When responders arrive at the scene of a rescue incident, they assume control of and responsibility for the building and surrounding area. Within certain limits, they can deny access to anyone, including the owner of the property. Typically, this control of the scene continues as long as emergency personnel are on the scene. Legitimate members of the news media may have certain constitutionally protected rights of access, but the interpretation of these rights varies from state to state and from country to country. Rescuers should be guided by local protocols and their agency's standard operating procedures.

At the conclusion of the incident, the incident scene should be released back to the owner or other party with responsibility for the property. Depending on the type of incident, responders may need to ensure that safeguards are in place to prevent property owners or the public from being harmed. The owner or **responsible party** should be escorted on a tour of the scene (or as close to it as possible, consistent with safety) and given an explanation of any remaining hazards. If the scene is still too hazardous to leave unattended, the owner may be required to post a security guard, erect a security fence around the hazard, or both (**Figure 5.6**). Before the scene is released, the AHJ may require the owner to sign a written release that describes the hazards and stipulates the conditions the owner must meet. Though laws and regulations vary by jurisdiction, responders typically give up their right to scene access once they leave and should seek permission of the owner (or a judicial warrant) before returning.

Responsible Party (RP) — An individual or group of people that are legally responsible or liable for a decision or action and therefore liable for the outcome.

Figure 5.6 A temporary fence may be erected to provide a degree of scene security.

Critical Incident Stress Debriefing (CISD)

Because the injuries suffered by the victims in technical search and rescue incidents can be unsettling, it may be appropriate to require responders and any others who interacted directly with the victims to attend a **critical incident stress debriefing (CISD)** session. Because individuals react to, and manage, extreme stress in different ways (some more successfully than others) and because the effects of unresolved stresses tend to accumulate, attendance at such sessions should be mandatory but participation should be optional. This session is not a function of rehabilitation but may help evaluate whether a responder is safe to go back into an incident scene.

Critical Incident Stress Debriefing (CISD) — Counseling designed to minimize the effects of psychological/emotional post-incident trauma on those at fire and rescue incidents who were directly involved with victims suffering from particularly gruesome or horrific injuries. *Also known as* Post-Traumatic Incident Debriefing.

The CISD process should actually start before rescuers enter the scene if it is known that conditions exist that are likely to produce psychological or emotional stress for the rescuers involved. If these conditions are present, the responders who are about to enter the scene should attend a formal briefing where they are told what to expect so that they can prepare themselves.

If rescuers will be required to work more than one shift in these conditions, they should go through a minor debriefing, sometimes called *defusing*, at the end of each shift. They should also attend the full debriefing process within 72 hours of completing their work on the incident.

Chapter Summary

In most jurisdictions, a technical search and rescue incident represents a high risk, low frequency response. The ability to safely and effectively respond to incidents of this nature is dependent on the ability to develop an IAP based on timely and accurate information. When all responders at an incident scene are acting in support of the IAP, the likelihood of a successful response is greatly increased. The activities described in the four phases of technical search and rescue responses are common across the many disciplines and this format will be used to describe responses in later chapters.

Review Questions

1. What procedures are part of the assessment of the rescue incident? (pp. 142-151)
2. What personnel may be involved in developing an Incident Action Plan? (pp.151-157)
3. What personnel accountability systems can be used to help implement the Incident Action Plan? (p. 158)
4. What are the ways in which a postincident analysis can help responding agencies? (p. 161)

Refer to Learning Activity Answers in the back of this manual for suggested responses.

Purpose

Search and rescue technicians will often encounter witnesses at the scene of an incident. As part of an initial assessment for developing an Incident Action Plan (IAP), technicians must be able to identify all witnesses, ask pertinent questions, and record the information accurately and quickly.

Directions

1. Read the provided surface water scenario and identify all potential witnesses at the scene. Additional information from various witness points of view has also been provided.
2. Create a list of questions you might ask each identified witness in order to continue the initial assessment at the scene.

NOTE: Remember to ask all witnesses for identification, including information on how they can be reached in case they need to be called back to the scene. Also keep in mind that questions for each witness may be potentially different given witness circumstance and location.

Scenario – Surface Water

Technical rescue personnel respond to an early evening call from a summer camp counselor who has reported the collapse of a floating wooden swim dock. Before arriving on scene, rescue crews receive reports via dispatch that at least two young campers had been playing on the dock when it broke apart in the middle, and that one of the campers had been able to swim back to shore. Whereabouts of the second camper is unknown.

When rescue crews arrive on scene, they find the camp counselor and one of the campers, aged 9, back on shore. In addition to the camper and counselor, one other bystander is on scene and witnessed the event from a nearby area. At least one victim remains trapped in debris from the dock, which is located approximately 90 feet (27 m) from shore. It is dusk and the weather is currently 74° F (23° C) with clear skies.

Additional Information from Witnesses

Camp counselor

You identify the victim as Adam Smith, 10 years old. He and another boy were jumping up and down on the dock, making it rock in the water. You were walking toward the shoreline to order them off the dock when the incident occurred. Adam and the other camper are your responsibility. Adam suffers from acute asthma and has inhalers in the infirmary.

Adam is a non-swimmer and did not have permission to be on the dock at the time of the incident. He was wearing shorts, a t-shirt, and tennis shoes. You don't know if he was wearing a life vest. The other camper returned to shore, but you have not made visual contact with Adam since the dock collapsed.

Refer to Learning Activity Answers in the back of this manual for suggested responses.

Camper who fell in water and returned to shore

You and your best friend, Adam, had taken a canoe out to a swim dock and were playing on the dock when Adam suggested you should both jump up and down on it and try to make big waves. You agreed and immediately started jumping. After about 10 jumps, you heard a loud "pop" and the dock broke. You fell into the water with all your clothes on, including shoes. You looked around for your life vest but you couldn't find it. You tried to touch the bottom of the lake, but it was too deep so you proceeded to swim back to the shore. It was hard because the water was cold, your clothes were heavy, and you were scared. Adam hasn't made it back to shore and you're very worried.

Camper who witnessed the event

You were playing tetherball by yourself in an area approximately 300 feet (90 m) from the dock. You heard a loud noise and yells for help. When you looked in the direction of the lake, you saw part of the dock sticking up from the water and two boys splashing around. You ran to the shoreline and found the camp counselor standing there. You don't know who the boys are or if they are the only ones in the water.

NOTES:

Refer to Learning Activity Answers in the back of this manual for suggested responses.

Purpose

One of the most vital aspects of incident scene control is understanding the roles and assignments of personnel at the scene. Responders must be able to identify the types of tasks and assignment responsibilities of all incident technicians and positions in order to implement a successful Incident Action Plan (IAP).

Directions

1. Refer back to the sections in the manual that discuss the roles of rescue group members. See the chart below for specific page numbers.
2. As you review, make a list of the various tasks and assignments for each rescue group member. Be as thorough as possible in your descriptions of member responsibilities.

Rescue Group Members	Page(s) in Manual
Rescue Group Supervisor	pp. 154-155
Assistant Safety Officer – Rescue	p. 155
Entry and Back-Up Teams	pp. 155-156
Rope Team	p. 156
Search Teams	p. 156

NOTES: