Federal Emergency Management Agency

United States Fire Administration

National Fire Academy

The Federal Emergency Management Agency (FEMA) was established in 1979. FEMA’s mission is to focus federal effort on preparedness for, mitigation of, response to, and recovery from emergencies encompassing the full range of natural and manmade disasters.

FEMA’s National Emergency Training Center (NETC) in Emmitsburg, Maryland, includes the United States Fire Administration (USFA), its National Fire Academy (NFA), and the Emergency Management Institute (EMI).

To achieve the Academy’s legislated mandate (under Public Law 93-498, October 29, 1974), “to advance the professional development of fire service personnel and of other persons engaged in fire prevention and control activities,” the National Fire Academy has developed an effective program linkage with established fire training systems that exist at the state and local levels. It is the responsibility of this division to support and strengthen these delivery systems. Academy field courses have been sponsored by the respective state fire training systems in every state.

The staff of the National Fire Academy is proud to join with state and local fire agencies in providing educational opportunities to the members of the nation’s fire services.
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MODULE 1

SLIDES
Chief Officer Training Curriculum

Operations
Module 1:
Application of the ICS

Objectives
♦ Identify ICS functions, elements, and responsibilities
♦ Define command presence, assuming command, transferring command, and establishing a Command Post (CP)
♦ Develop a basic ICS organization for an emergency incident
♦ Develop an extended ICS organization for a major emergency incident

Overview
♦ ICS overview
♦ ICS major functions
  - Command
  - Operations
  - Planning
  - Logistics
  - Finance/administration
♦ ICS management techniques
History of the ICS

- Before 1970: department-specific
- Past 30 years:
  - FIRESCOPE ICS
  - Fire Ground Command (FGC)
  - Combinations of ICS and FGC
  - National Fire Service Incident Management System Consortium

FIRESCOPE

- Catalyst: wildland/urban interface fires in 1970's
- Adapted to structural firefighting and "all-risk" incidents
- Flexible model:
  - Any type or size incident
  - Any department or agency

NATIONAL INCIDENT MANAGEMENT SYSTEM - (NIMS)

- More than ICS, NIMS includes:
  - Command and Management
  - Preparedness
  - Resource Management / Mutual Aid
  - Communications and Information Management
  - Supporting Technologies
  - Ongoing Management and Maintenance
- The ICS established in the NIMS is based on the Incident Command System Operational System Description document (ICS 120-1) developed by FIRESCOPE.
- Many other agencies besides fire agencies – both public and private – will be adopting the DHS NIMS.
Differences between NIMS and Forescope ICS

- The Information Officer position is called the Public Information Officer (PIO).
- The intelligence and information function may be organized in one of the following ways:
  - Officer within the Command Staff.
  - Unit within the Planning Section.
  - Branch within the Operations Section.
  - Separate General Staff section.

ICS Command and General Staff Positions

Information and Intelligence Options
Need for ICS

- In your department:
  - Safer, better handling of incidents
  - Professional approach
  - More effective use of resources

Expanded Incidents

- Simple ICS organization at routine incidents
- Expanding incident cues ICS transition
- ICS organization expands with needs
  - Modular design
  - Delegation of command responsibility

ICS Command and General Staff Positions

- COMMAND
  - SAFETY
  - LIASON
  - PUBLIC INFORMATION
  - OPERATIONS
  - PLANNING
  - LOGISTICS
  - FINANCE ADMINISTRATION
Command

- Determines strategies
- Selects tactics
- Sets the Incident Action Plan (IAP)
- Develops the ICS organization
- Manages/coordinates resources
- Provides for safety
- Releases information
- Coordinates resource activities

Unified Command

A unified team effort that allows all agencies with responsibility for the incident, either geographical or functional, to manage the incident by establishing a common set of incident objectives and strategies without losing or abdicating agency authority, responsibility, or accountability.

Unified Command

- Cues: multiple agencies/jurisdictions
- Selection of participants:
  - Legal responsibilities
  - Location of incident
  - Type of incident
  - Previous training and experience
- All participants contribute to the command process
Command Staff

- Scene Safety
- Authority to take action
- Interface with agencies
- Liaison area

ICS General Staff Positions

Operations

- Manages all resources directly engaged in incident operations
- Determines and directs tactical operations
- Allocates and assigns resources
- Assists in developing the action plan
Operations (continued)

- When to staff:
  - Complex incidents (20+ units)
  - IC must focus on “big picture”
- When Operations is staffed:
  - IC does strategies
  - Ops does tactics

Planning

- Collects and evaluates information
- Records resource status
- Documents the incident
- Assists in developing the action plan

Planning (continued)

- When to staff:
  - When the IC needs assistance at the Command Post
  - On complex incidents where analysis and strategic planning are too time-consuming
**Logistics**

- Provides facilities, services, and materials to support incident operations
- Assists in developing the action plan

**Logistics (continued)**

- **When to staff:**
  - When service and support functions are required to maintain operational forces
  - On complex, resource-intensive incidents
  - On incidents that will extend for a long time

**Finance/Administration**

- Responsible for all financial and legal aspects of the incident
- **When to staff:**
  - Abnormal costs are encountered
  - Reimbursement is possible
Delegating Responsibilities

The IC:
♦ Is responsible for any functions not delegated
♦ Has ultimate responsibility to ensure all incident requirements are met

The Operations Section

A CLOSER LOOK

Single Resources and Crews

♦ Single resource: individual company
♦ Crew: personnel without apparatus
Task Force/Strike Team

- Task force: group of single resources
- Strike teams: same-type resources

Task Force Example

Strike Team Example
Grocery Store Example

- Fire involves 25% of the front of the store
- First alarm
  - 2 engines
  - 1 truck
  - 1 chief

Grocery Store Example (continued)

- The complex ICS you have heard about
- How many alarms handled by this size organization?

Staging

- Resources ready for immediate assignment temporarily located
- Personnel in POVs should report for formation into crews
Level 1 Staging

- Used to control first-alarm units
- One or two units and chiefs go directly to scene
- All other first-alarm units stop one block from scene
- Report ("identity, location, direction")
- Wait for an assignment!

Level 2 Staging

- Formal staging area determined by IC when second alarm or mutual aid requested
- Request is cue to staff the staging area Manager function
- Announce staging area location on radio
- Staging versus base

Grocery Store Example (continued)

- IC requests additional resources
- Second alarm:
  - 3 engines (E-3, E-4, E-5)
  - 1 truck (T-2)

How will they be distributed?
Grocery Store Example (continued)

- Assume seven units at the scene

- What's wrong with this organization?

- Organize resources by geographic area
- Require departments to establish a method of dividing the incident scene
Dividing the Incident

♦ ABCD System

Division C
Division B
Structure
Division D
Division A

Dividing the Incident (continued)

♦ Exposure System

Exposure C
Division C
Division B
Structure
Division D
Division A
Exposure D

Dividing the Incident (continued)

Each floor is a division.

Division 5
Division 4
Division 3
Division 2
Division 1
Groups

- Organize resources by functional area of responsibility
- Work across division lines
- Operate at the same command level
- Coordinate with Division Supervisor

Grocery Store Example

- Start at the division and group level
- Plug in resources as they arrive

Garden Apartment Example
Activity 1.1:
Application of the Basic ICS Functions

Scenario 1

Scenario 2
The Operations Section (continued)

- Staffing the operations function
  - Span of control exceeded
  - Other concerns

Garden Apartment Example

More complex than previous example:
- Larger building and fire area
- Nighttime fire situation
- Residents displaced from 48 apartments
- Dead-end water main
- No rear vehicle access to apartments
- Limited road access
More problems for the IC
- Inability to focus on tactical operations
- Result: operations function is staffed

Branches
- Responsible for all tactical operations in assigned portion of action plan
- Under direction of the IC or operations section chief
Branches (continued)

Should the exposure branch director position be staffed?

Haz Mat Example

- Incident requires many special resources
- Branches give experts flexibility and control

Branches (continued)

Command

Other functions

Rescue Branch  Suppression Branch  EMS Branch  Haz Mat Branch
Review of Operations

Command
- Operations
  - RIC
  - Staging
  - Branch
  - Branch
  - Division
  - Group
  - Strike Team
  - Task Force
  - Crew

Planning Section

- Staffed as needed to manage incident
- Section chief reports directly to IC

Planning Section (continued)

- Resource Unit
- Situation Unit
- Documentation Unit
- Demobilization Unit
- Technical Specialists
Logistics Section

- Staffed as needed to manage incident
- Section chief reports directly to IC

Logistics Section (continued)

Finance/Administration

- Staffed as needed to manage incident
- Section chief reports directly to IC
Finance/Administration (continued)

Also responsible for legal matters at incidents

Activity 1.2:
Using the ICS at a Major Incident

Command Presence

- What is command presence?
- How can fire officers improve command presence?
Assuming Command

- What is confirmation of command?
- What are your department’s requirements for assuming command?
- Identify command.

Transfer of Command

- What should be included in a transfer of command methodology?
- What is passing command?

Establishing a Command Post

- What does a command post provide?
- Where should the command post be located?
Module Summary

- History and purpose of ICS
- National Incident Management System (NIMS)
- ICS at expanded incidents
- ICS functions and command staff
- Resource terminology and staging
- Divisions, groups, branches
- Incident management techniques

Module Summary (continued)

- Apply ICS to any incident regardless of size or type
- Carry out all functions at every incident
- All fire officers should train in ICS
MODULE 1

APPLICATION OF THE INCIDENT COMMAND SYSTEM (ICS)
**Module 1:**

**Application of the Incident Command System (ICS)**

**Objective**
Upon completing this module, you will be able to establish an appropriate ICS organization for an incident.

**Methodology**
This module uses lecture, discussion, and activities to review and delineate the functional elements of the ICS organization and the application of these functional elements to expanded emergency operations.

**NFPA 1021 Standards Cross-Reference Matrix**
3-6, 3-7, 4-6, 4-7
History of the Incident Command System

Before the 1970’s, each fire department had its own method for commanding incidents. This fragmented approach has changed over the past 30 years as several formal Incident Command Systems (ICSs) have been developed, including:

- FIRESCOPE ICS;
- Fire Ground Command System (FGC);
- Combinations of ICS and FGC;
- Integrated Emergency Management System (IEMS);
- The National Fire Service Incident Management System Consortium; and
- The National Incident Management System (NIMS).

**FIRESCOPE Incident Command System**

Serious wildland/urban interface fires in Southern California in the early 1970’s proved disastrous both for the fire service and for the residents. A number of fire-related agencies at the state and Federal level decided that better organization was necessary to combat these very costly fires. The organization became known as FIRESCOPE (FIre RESources of California Organized for Potential Emergencies).

FIRESCOPE was funded initially by the Federal government. The mission was to focus on solutions to a variety of problems associated with large, complex emergency incidents during wildland fires. These problems included:

- Command procedures;
- Resource management;
- Terminology; and
• Communications.

After a series of meetings, the ICS was developed and adopted. Success at wildland fires led to its application to structural firefighting and eventually to its current acceptance as an all-risk system. ICS can be used at any type or size of emergency incident and by any type or size department or agency.

In 1986, the National Fire Academy (NFA) supported the FIRESCOPE ICS as the model fire service incident management system. With minimal modifications, the FIRESCOPE ICS is compliant with the new National Incident Management System (NIMS) ICS developed by the Department of Homeland Security. The NIMS has been adopted by the NFA for all its courses.

National Incident Management System

On February 28, 2003, President Bush issued Homeland Security Presidential Directive-5 (HSPD–5). One purpose of HSPD-5 is “to enhance the ability of the United States to manage domestic incidents by establishing a single, comprehensive national incident management system.” This excerpt from HSPD-5 outlines the tasking given to the Secretary of Homeland Security:

(15) The Secretary shall develop, submit for review to the Homeland Security Council, and administer a National Incident Management System (NIMS). This system will provide a consistent nationwide approach for Federal, State, and local governments to work effectively and efficiently together to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity.

On March 1, 2004, after close collaboration with State and local government officials and representatives from across a spectrum of public safety organizations, the Department of
Homeland Security (DHS) issued the National Incident Management System (NIMS). The NIMS integrates existing best practices into a consistent, nationwide approach to domestic incident management that is applicable at all jurisdictional levels and across functional disciplines in an all-hazards context.

Six major components make up this systems approach. A brief summary of topics in these six sections follows.

- **Command and Management**
  - ICS
  - Multi-agency Coordinating Systems
  - Public Information Systems

- **Preparedness**
  - Planning – training – exercises
  - Personnel qualification and certification standards
  - Equipment acquisition and certification standards
  - Publication management processes and activities

- **Resource Management/Mutual Aid**
  - Standardized requirements for processes to describe, inventory, mobilize, dispatch, track, and recover resources over the life cycle of an incident.
  - Includes resource typing and mutual-aid concerns

- **Communications and Information Management**
  - The NIMS identifies the requirement for a standardized framework for communications, information management (collection, analysis, and dissemination), and information sharing at all levels of incident management
  - Includes agencies and jurisdictions responsible for managing or directing domestic incidents, those impacted by the incident, and those contributing resources to the incident management effort
  - Helps ensure that crisis decision-making is better informed
Supporting Technologies

- These include voice and data communications systems, information management systems (i.e., record keeping and resource tracking), and data display systems
- Supporting interoperability and compatibility

Ongoing Management and Maintenance

- Provide strategic direction for and oversight of the NIMS - supporting both routine review and the continuous refinement of the system and its components over the long term
- This is one of the primary responsibilities of the NIMS Integration Center.

Of these components, the concepts and practices for Command and Management and Preparedness are the most fully developed, reflecting their regular use by many jurisdictional levels and agencies responsible for incident management across the country. Resource Management, Communications and Information Management, Supporting Technologies, and Ongoing Management and Maintenance introduce many concepts and requirements that are also integral to the NIMS but that will require further collaborative development and refinement over time. Although there is a heavy reliance on technology to link the components of the NIMS, the success of the NIMS will depend largely on whether State, local, and tribal governments also adopt key implementation strategies that accompany the use of new technologies.

Throughout this training course, when the term “ICS” is used it should be understood that the reference is to the incident management system described in NIMS, and to include the application of NIMS principles to the specific scenario being discussed.

Many other agencies besides fire agencies – both public and private – will be adopting the NIMS as required by the DHS.
The ICS established in the NIMS is not a new emergency incident management system. It is based on the *Incident Command System Operational System Description* document (ICS 120-1) developed by FIRESCOPE.

The two most significant differences between NIMS and FIRESCOPE ICS are:

- The Command Staff Information Officer position is now called the Public Information Officer (PIO), and
- The intelligence and information function may be organized in one of the following ways:
  * As an Officer within the Command Staff,
  * As a Unit within the Planning Section,
  * As a Branch within the Operations Section, or
  * As a separate General Staff Section.

The following discussion helps guide the determination for the most effective placement of the information and intelligence function in the NIMS.

- **As an Officer in the Command Staff**
  * This option may be most appropriate in incidents with little need for tactical or classified intelligence and in which incident-related intelligence is provided by supporting Agency Representatives, through real-time reach-back capabilities.

- **As a Unit within the Planning Section**
  * This option may be most appropriate in an incident with some need for tactical intelligence and when no law enforcement entity is a member of the Unified Command.

- **As a Branch within the Operations Section**
* This option may be most appropriate in incidents with a high need for tactical intelligence (particularly classified intelligence) and when law enforcement is a member of the Unified Command.

- **As a General Staff Section**

  * This option may be most appropriate when an incident is heavily influenced by intelligence factors, or
  * When there is a need to manage and/or analyze a large volume of classified or highly sensitive intelligence or information
  * This option is particularly relevant to a terrorism incident, for which intelligence plays a crucial role throughout the incident life cycle.

The information and intelligence function also has the responsibility for coordinating information and operational security matters with public awareness activities that fall under the responsibility of the PIO, particularly where such public awareness activities may affect information or operations security.

Regardless of how it is organized, the information and intelligence function is responsible for developing, conducting, and managing information-related security plans and operations as directed by the IC. This can include information security and operational security activities, as well as the complex task of ensuring that sensitive information of all types (e.g., classified information, sensitive law enforcement information, proprietary and personal information, or export-controlled information) is handled in a way that not only safeguards the information but also ensures that it gets to those who need access to it so that they can conduct their missions effectively and safely.
Additional Information about NIMS

A downloadable, PDF version of the NIMS can be found on the NIMS Integration Center Web site, http://www.fema.gov/nims/nims.shtm


The NIMS Implementation Center (NIC) has developed a NIMS Web page to provide updated information and resources to assist with NIMS implementation requirements. The Web page can be found at: www.fema.gov/nims

Incident Command

Only a few years ago, most departments had never heard of incident command. *Incident Command* is now a byword, and many departments are actively developing or using some type of command system. The majority of our incident-scene problems are not the result of poor tactical operations. Frontline firefighters generally carry out tactical assignments with a high degree of efficiency. The problems occur at the command and control level. Unfortunately, many commanders believe that the conventional rules do not apply to the unique aspects of emergency response. They invent new rules or use rules established many years ago instead of using a common system that has applications in every emergency response.

All emergency operations have one requirement in common: they must have organization to be successful. Think about the last incident you had that turned out to be a complete fiasco. Did personnel do exactly what they were supposed to do, and did you have a good understanding and control of what was going on? How about the last incident that went well? How did it compare to the fiasco in terms of overall organization and control?
A Systems Approach

One of the best ways to understand an organization’s nature is to view it from a systems approach. Over the past 20 years, many knowledgeable people have come to consider the systems approach to business management as the single most influential concept of contemporary organizational theory.

What is a System?

A system has been identified in various ways. By visualizing the human body or a business organization as a complete system with various subsystems, you can recognize that a system is a collection of interrelated parts. These components may be an identifiable grouping of people, mechanical parts, procedures, and/or resources. Specifically, a system is a unit of interrelated parts or functions designed to achieve a common goal.

All subsystems are important to the success of the overall system. Some subsystems may be used more than others, and likewise, some subsystems, when they fail, can have a more detrimental effect on the total system than others.

How Other Organizations Function

The systems approach is not new; there are many examples of its use. The automobile industry is one such example. An automaker’s goal is to produce an automobile that will appeal to the public in order to increase sales. To accomplish this, various units research the desires of the public, design the vehicle, build and paint the vehicle, test the vehicle, and sell and service the vehicle. Many of these units work independently, but all are necessary to achieve the goal. The results of overemphasizing any one unit obviously will affect the ability of the system to achieve the goal.

The military is another example of the systems approach. Imagine the infantry attempting to win a victory in battle without interrelationships with other units such as artillery, ordnance, quartermaster, and commissary.
Why Organizations Use a Systems Approach

Organizations use a systems approach for many reasons. Once a goal is established, all the operations necessary to achieve that goal can be identified. These operations then can be grouped into related functional areas. This approach helps clarify functional responsibilities: which group is responsible for which product or phase of the operation? Accountability can be established because individuals within a functional area can be given specific responsibilities. Duplication of effort can be minimized because of the ability to recognize specific responsibilities.

Coordination

A systems approach also provides a mechanism for coordinating the efforts of all personnel through delegation of authority and responsibility. Giving someone else the ability to carry out responsibilities develops a clear line of authority and creates a manageable span-of-control (the number of individuals or jobs that can be supervised effectively by one person). Delegating authority means that one individual does not have to oversee all facets of operations. It is also conducive to the “one person, one boss” concept (unity of command) in which each individual has only one person to whom he or she reports.

Identifying Responsibilities

Identifying functional areas also makes it easier to identify necessary tasks. Concentrating on one area, rather than on many areas, tends to ensure that all tasks in that area are addressed.

Equally important is prioritizing tasks. When objectives are limited to the scope of one functional area, tasks necessary for that accomplishment are more easily identified and are carried out in the proper order. People are less likely to freelance.
Safety

Safety should be a major concern to all organizations. During the past decade, an increased emphasis has been placed on worker safety. Involvement by all levels of government has resulted in a variety of laws and agencies to ensure a safe working environment, both short- and long-term. Safety is a responsibility of everyone in an organization, but it is of primary importance to the supervisor and/or manager. A systems approach allows those responsible for functional areas to monitor and enforce safety regulations for their areas. An operation that has no organization is usually one in which various tasks and responsibilities are overlooked. Invariably, safety is one of the first to fall into that category. The systems approach facilitates the formation of a separate safety function in those organizations large enough or complex enough to warrant one.

Streamline Communication

When operational problems are discussed, communication is always mentioned. Generally, too much nonessential information is routed to all areas, and not enough relevant information is routed to the proper places. A systems approach helps identify who gets what information. Personnel in various functional areas can identify the information that is relevant to their areas or objectives. Using this approach, communication has a purpose for those who receive it. Listening and comprehension are enhanced because time and effort are not wasted scanning large quantities of information to determine its relevance or importance.

Day-to-Day Fire Department Operations

Most fire departments of any size are responsible for various areas, such as suppression, EMS, training, and prevention. These are the functional areas within the department.

Typically, these areas come under the command of a chief officer or another appropriate authority. In other words, responsibility is delegated by function. Personnel assigned to
these functional areas answer to their superiors in that area, thus maintaining clear lines of authority and communication.

Each area is responsible for objectives developed as a part of the overall goals of the department. Generally, personnel in each area set priorities for accomplishing those objectives.

Characteristics of the ICS

All management systems require the establishment of an organizational structure that provides the hierarchy of responsibility, authority, and channels for formal communications. This structure gives everyone in the organization an understanding of his or her authority and responsibilities. Important characteristics include:

- Common terminology;
- Modular organization;
- Integrated communications;
- Manageable span-of-control; and
- All-risk system.

Common operating procedures—In emergency operations, we must have the ability to move rapidly from a nonincident method of organization to a method appropriate for emergency incidents. We must have a standard methodology that allows us to react in a consistent manner and to get into the basic level of our emergency scene organization immediately.

Common terminology—For effective communication, words must have a single definition, functional areas must have one set of responsibilities, and no two words can have the same definition. If this axiom is changed, it will create confusion.
Personnel qualifications—ICS is not a rank-oriented system, but a performance-oriented one. The best-qualified person is placed into the appropriate functional level for each situation. This concept is critical for the effective application of the system, and must be embraced by management.

All personnel who are going to be involved anywhere, at any level in the system, must be trained in the use of ICS.

The need for an Incident Commander (IC)—The only position (function) in the ICS that must always be staffed is the Incident Commander (IC). (On haz mat incidents, the safety officer position must also be staffed.) There must be someone in charge who is responsible and accountable. This position must be assumed by the first or ranking member of the fire department to arrive at the scene.

All-risk/all-hazard system—The ICS, while originally designed for wildland fires, has evolved into an all-risk, all-hazard emergency management system. ICS is a “resource-management tool.” Firefighters manage resources, not fires, floods, tornadoes, plane crashes, haz mat incidents, or mass casualties. ICS has been used on all types of emergency and nonemergency situations.

Jurisdictional authority—Unless Federal, state, or local law states otherwise, the ranking officer from the jurisdiction (or his or her designee) is the IC. He or she cannot be removed from this position unless the law states otherwise. However, command may be transferred to another person from another agency or jurisdiction at the IC’s discretion.

Span-of-control—Span-of-control refers to the number of personnel who are reporting to any given individual. Optimum span-of-control in the ICS is five, with an acceptable range of two to seven. On a situation that is not yet under control, individuals operating under ICS should have no more than five personnel reporting directly to them. The appropriate number will be driven, to some degree, by the complexity of the incident. For example, in haz mat or
structural collapse incidents, the span-of-control may only be three due to the complexity of operations.

Unity of command—Unity of command is a management concept in which each person has only one supervisor, and he or she knows who that supervisor is. When anyone receives orders from more than one person, confusion is the only logical outcome. Confusion causes delays in solving problems and increases the potential for life and property losses for fire departments.

Everyday application—Responders must develop appropriate habits in order to manage large incidents effectively under the ICS. The only way to develop a habit is to do the same thing repeatedly. Personnel must implement ICS on every incident, using only those functions that are applicable considering the complexity of the incident and the number of resources on scene. Practice reinforces learning.

ICS at Expanded Incidents

Typically, the ICS organization at routine incidents is simple. There are relatively few problems, a limited number of resources, and the IC can handle all management functions.

Expanding Incidents

An expanded incident cues the need for a more complex ICS. At a more complex incident, more problems need solutions. An increased number of resources results in increased management concerns. The IC is unable to do all the jobs and provide all the answers without assistance.

The basic ICS organization must expand with the needs of the incident. As conditions or needs change, so must the organizational structure. The modular design of ICS allows the organization to be structured for specific incidents.
Attempting to deal with all management functions may overload the IC. When overload occurs, the IC may overlook important details, and personnel safety may be compromised.

The solution is to use the ICS to delegate specific responsibilities and authority to other personnel. The ICS provides a systems approach to effective incident organization.

**Structuring the System Requires Understanding**

A command officer must understand the functional positions in the ICS, and the responsibilities and roles of each functional position.

**Unified Command**

In ICS, unified command is a team effort that allows all agencies with responsibility for the incident, either geographical or functional, to manage an incident by establishing a common set of incident objectives and strategies without losing or abdicating agency authority, responsibility, or accountability.

In a single command situation, only one agency has legal responsibility.

Hazardous materials incidents, mass-casualty incidents, natural disasters, or wildland fires, among others, may involve a number of jurisdictions and/or agencies that have a legal or functional need to be involved directly in the decision-making process. The worst thing that can happen is to allow each of these responsible agencies to establish a CP of its own. In this instance, it is critical that there be a unified command.

**What Signifies the Need for a Unified Command?**

More than one agency is responsible for decision-making within a single jurisdiction.
More than one jurisdiction is involved.

All agencies with geographical, functional, or legal responsibility to manage the incident contribute to the command process. Together they determine overall incident objectives, develop strategies, and plan tactical activities jointly. This method ensures the most effective use of all assigned resources.

Selection criteria for staffing the unified CP:

- The location of the incident;
- The political jurisdiction involved;
- One key official from each jurisdiction or responsible agency involved;
- Representatives from departments in a single jurisdiction; or
- Representatives from agencies with legal responsibilities for the outcome.

Generally, the agency with the greatest jurisdictional involvement is assigned the operations function. Depending on the type of incident, someone must determine which agencies actually have responsibility. The lead role may even change over the course of an incident, for example, a terrorism event in which command changes from fire to police and back again. It is important to recognize prior training and experience when staffing the unified CP and operations function.
ICS Command and General Staff Positions

The Five Major Functions

- Operations
- Planning
- Logistics
- Finance/Administration

These are the major functional management areas of the ICS. The chiefs of each of the four major sections are known as the ICS general staff.

It is important to remember that the blocks in the ICS are functions or jobs, not positions that must be staffed. However, the IC must carry out any function not staffed.

Command

The first component of the ICS is command. No operation can be implemented unless someone is in charge. Command is responsible for:

- Determining strategy;
- Selecting tactics;
- Setting the action plan;
- Developing the ICS organization;
• Managing resources;
• Coordinating resource activities;
• Providing for scene safety;
• Releasing information about the incident; and
• Coordinating with outside agencies.

Command Staff

Command is responsible for the overall activities, and there are certain functions that an IC must be accountable for immediately. These functions cannot be delegated to other major functional areas and are considered command functions. The command staff—safety officer, liaison officer, and public information officer—report directly to the IC.

Safety

The safety officer is responsible for enforcing safety procedures and practices at the emergency scene. He or she also identifies present and potential hazardous or unsafe conditions.

Normally, this position is staffed when the IC cannot devote sufficient time to monitoring safety. As the number of
resources and incident complexity increase, the IC must have someone else focus on safety.

The safety officer has the authority to stop unsafe acts or “alter, terminate, or suspend operation,” when time or conditions prevent using regular lines of authority. He or she must notify the IC immediately when such an action is taken since operational strategy may be affected. This authority is clearly stated in national standards and in Federal regulations dealing with emergency response.

A safety officer should not be just anyone on the incident scene. The safety officer for structure firefighting must be very knowledgeable in fire behavior, building construction and collapse potential, strategy and tactics, and department safety rules and regulations. A safety officer should also have considerable experience in incident response.

Some agencies have a full-time safety officer; others assign individuals safety officer responsibilities in addition to their regular duties. NFA’s Incident Safety Officer course is an excellent resource for people who may serve in this capacity.

Liaison

The liaison officer is the point of contact with outside agency representatives. He or she is responsible for identifying and coordinating with all outside agencies.

The liaison officer acts as a buffer between the IC and other agencies. The position is staffed when the IC cannot devote sufficient time to communicating with outside agency representatives.

The liaison area should be set up adjacent to, but not at, the CP. Who belongs in the liaison area? Agencies that provide assistance, but have no legal responsibility for the outcome, are usually placed in liaison. Agencies that provide significant human resources to incident operations should be at the CP.
(for example, Red Cross, Highway Department, and Salvation Army).

**Public Information**

The public information officer is responsible for gathering and releasing incident information to the media and other appropriate agencies and acts as a buffer between the IC and the media. All media releases must be approved by the IC. The public information officer has the responsibility to update the IC on media needs, and the IC should keep the public information officer current on the status of operations.

This position is staffed when the IC cannot take the time to talk to the media. Information establishes a media area away from the CP, and acts as media point-of-contact.

**Operations**

Operations is responsible for the management of all operations directly applicable to the primary mission. Its function is to direct the organization’s tactical operations to meet the strategic goals developed by command. Operations allocates and assigns resources to establish control of the incident, and participates in the development of the Incident Action Plan (IAP).

The operations section chief’s function is established on complex incidents involving, or projected to involve, more than 20 single resources, or when the IC must focus on the big picture and cannot be involved in the details of tactical operations.
When operations is staffed, the IC focuses on strategy and the operations chief focuses on tactics. The IC no longer talks to the operational divisions, groups, or single resources.

Planning

The planning section chief reports directly to command. Planning is responsible for the collection, evaluation, dissemination, and use of information relevant to the incident. Planning must understand the current situation, predict the probable course of events, and prepare optional strategies and tactics.

For an organization to operate effectively, it must base its decisions on the best information available. This information must be evaluated, and trends must be projected. Command will use this information to prepare and develop strategic goals as well as alternate plans.

Planning is also responsible for maintaining the status of resources, documenting the incident, and providing a demobilization plan. Planning participates in the development of the action plan.

The planning section chief’s position is staffed when the IC needs assistance at the CP to determine the appropriate strategy and tactics. This need could be the result of having little or no experience with the incident type. In this case, two heads may be better than one. The function also is staffed on complex incidents where information analysis and strategic options cannot be accomplished by one person in a timely manner.
Logistics

The logistics section chief reports directly to command. Logistics is responsible for providing facilities, services, and materials in support of the incident; it is the supply officer for the incident. Logistics participates in the development of the action plan.

The logistics section chief’s position is staffed when service and support functions that are required to maintain the operational forces exceed the IC’s ability to manage them. This generally occurs on complex, resource-intensive or long-term incidents.

Finance/Administration

Finance/administration is the fifth and last major component of the ICS. The finance/administration section chief reports directly to command and has responsibility for all costs and financial aspects of the incident. This function receives the least amount of consideration at the majority of incidents since associated costs are dealt with after the fact. However, large-scale or long-term incidents generally require immediate cost consideration, particularly when outside resources must be procured quickly.
The finance/administration section chief’s position is staffed on incidents at which abnormal costs will be encountered, or on incidents where reimbursement of incident costs is a possibility. These include Federally declared disaster situations or haz mat incidents where reimbursement may come from the shipper, carrier, or manufacturer of the chemical, a government agency (for example, the LGR program), or insurance companies.

**Command Responsibility**

The IC is responsible for any functions not delegated. Command’s ultimate responsibility is to ensure that all incident requirements are met.

The next section of the course provides information on the four major ICS functions (general staff) at expanded incidents.

**The Operations Section**

The terms *engine* and *truck* represent personnel who are doing specific tasks at the scene of an incident. If your department does not have truck companies, it is important to remember that someone must still do “truck” tasks, for example, ventilation.

The ICS organization charts used in this section and those presented in the classroom lecture represent the fire scenes shown on the slides during lectures. These charts are correct, but they represent only one way of managing a specific incident using ICS.

**Single Resources and Crews**

A single resource is an individual company, for example, engine, truck, rescue, and ambulance.

A Rapid Intervention Crew (RIC) is designated to stand by in a state of readiness to perform rescue efforts of fire fighters.
During the initial stages of an incident, it may be staffed with as few as two fire fighters. As the complexity of the incident grows, the RIC may increase to a company or multiple companies operating under a group supervisor. The RIC reports to the IC or if an operation section is established, the RIC shall report to the operations section chief.

Personnel who arrive at the incident scene in vehicles other than fire apparatus (for example, engines or trucks) are formed into a working unit called a crew, with a crew leader. Crew size should conform to span-of-control guidelines; crews normally are designated by the crew leader’s name, or by function (for example, Crew Smith, vent crew).

**Task Force**

A task force is a group of resources, with common communications and a leader, that may be pre-established and sent to an incident or formed at an incident. For example, a task force may be one engine and one truck; two engines and a brush vehicle; two engines and two ambulances; three engines and two trucks, etc. A task force operates under the supervision of a task force leader.

The task force may be assembled at the incident scene to provide specialized resources required for a specific job. Task forces may be assembled before an incident and become part of the department’s dispatch philosophy. For example, Los Angeles City dispatches task forces of two engines and one truck. These apparatus arrive on scene with several officers and personnel, but only one officer is designated as the task force leader. All communications for the task force units are directed to the task force leader.

Some departments create task forces of one engine and one brush unit for response during brush fire season. The brush unit responds with the engine company wherever it goes. Unless a fixed part of the dispatch system, task forces are usually disbanded after the mission is complete.
Strike Team

A strike team consists of specified combinations of the same kind and type of resources with common communications and a leader. For example, a strike team may be five engines (engine strike team), five trucks (truck strike team), or five ambulances (EMS strike team). Strike teams most often comprise engine companies.

Strike teams are most commonly assembled for wildland fires. Using strike teams is the most reasonable way to control 100 to 200 single engine companies, since they would represent only 20 to 40 strike teams. Strike teams may be used at structure fires (as may any ICS function), but this is not the norm.
Strike teams, and more often task forces, may be used by division and group supervisors to correct a poor span-of-control problem.

This organization chart is for the first alarm for a grocery store fire with three companies/crews and a chief officer. There is a 25 percent involvement of the grocery store. This fire is large enough to add resources to show the application of ICS.

```
COMMAND

Fire Attack       Rescue             Vent
E-1               E-2               T-1
```

The chief is command. Engine/Crew 1 has been assigned to advance a hose line into the building and begin to attack the fire. Engine/Crew 2 has been assigned to provide a backup line and do primary search.

Truck 1/Crew 3 has been assigned ventilation.

The radio call sign for the IC is “Command”; it is not “Chief 1.” When assigned a functional responsibility in the ICS, your radio call sign becomes the function name.

This size of ICS organization will handle approximately 90 to 95 percent of your incidents.
Staging

Staging is directly responsible to operations. If operations is not staffed, staging reports to command. Staging is responsible for the coordination, support, and distribution of incoming resources.

Staging is a location where resources ready for immediate assignment into the incident are placed temporarily. There are two levels of staging.

**Level 1 Staging**

Level 1 staging is used to control the first alarm or initially dispatched units.

Have you ever responded with three to six pieces of apparatus to find a pot of food burning on a stove? All apparatus park right in front of the dwelling. Personnel from those units trek through the house, over the white carpet, to see the burned food. Not only do they cause a mess, but a public relations problem—the public may view this situation as an example of excessive use of fire department resources.

Or, your department has the problem of companies assigning themselves on arrival (freelancing).
Alternatively, you are the IC, and all the responding units are calling you for assignments at this working fire. You are not ready to make assignments yet, but they keep calling you every 20 seconds until you give them an assignment or they assign themselves.

You can eliminate problems—such as convergence of apparatus, freelancing of personnel, and excessive radio traffic—by establishing within your SOGs a policy of Level 1 staging.

As determined by the IC, only one or two pieces of apparatus can go directly to the scene (excluding chief officers). Any other unit responding must stop approximately one block from the incident in the direction of travel and report its location. If possible, the chosen site should permit ready access to all sides of the incident scene. For example, the Engine 2 officer calls command and states “Engine 2 one block west.” Now Engine 2 can get to the incident scene only on an order from command.

Level 2 Staging

Level 2 staging is a location to which all second or greater alarm or mutual-aid companies report. The staging location should be announced and a staging area manager designated when the additional resources are dispatched.

For example, a second alarm is responding to the grocery store fire discussed earlier. All of the responding units could be allowed to respond directly to the staging area, or some could receive assignments while en route. Those not receiving assignments would go to staging.
Span-of-Control

Now, we place both alarms on the ICS organization chart.

What is wrong with this ICS organization?

Divisions and Groups

Divisions

A division is responsible for operations within a defined geographic area. This area may be a floor in a building, the rear of a fire building, or a section of a brush fire. This is the level most often employed during routine fire department emergency operations.
Dividing the Incident Scene

To use division terminology effectively, a department must use a method to divide the incident scene. Examples include methods based on the sides of a burning structure, exposures, or floors of a building, as depicted below.

Exposure C
Division C

Exposure B
Division B

Exposure D
Division D

Front/Address Side
Groups

Groups generally are assigned to a specific function, such as ventilation, search and rescue, and water supply.

Groups are responsible for an entire job wherever it may be required; therefore, they work across division lines. This being the case, group supervisors must coordinate with the division supervisors when they enter a division or perform work that will affect division personnel, operations, and
safety. Groups should do nothing in a division without prior consultation with the division supervisor.

Division and group supervisors are at the same authority level in the ICS. Divisions cannot report to groups, and groups cannot report to divisions. However, effective communication among divisions and groups during emergency operations is critical.

Application of Division and Groups

Establish a habit of operation that will set the organizational foundation when you have a more serious situation.

Let’s look at a three-story garden apartment fire. The center section of the structure is well involved at the attic and third-floor levels. Six engines, two trucks, and a rescue unit have arrived, approximately 34 personnel, or 9 crews. Other units are responding. Engines carry four people, trucks four, and rescue units two.
Three-Story Garden Apartment

Firewall → [Diagram] → Firewall

Center Section 50- to 75- percent involved
3rd floor and attic

E-1 arrives—The officer gives a brief initial report and directs the E-1 crew to attack the fire with a 1-3/4-inch hose line from the third floor and do primary search on that floor. The officer assumes command. Command requests a second and third alarm.

E-2 arrives—Command directs the officer of E-2 to assume Division 3. Command assigns E-1 crew to Division 3.

Truck 1 arrives—Command directs T-1 officer to assume attic division and stop the fire from spreading past the firewalls on Sides B and D. Attic division requests one additional engine and one additional truck.

Chief 1 arrives—Chief 1 assumes command and retains the officer of E-1 to assist at the CP.
E-3 arrives—Command assigns E-3 as RIC.

E-4 arrives—Command directs E-4 to report to attic division.

T-2 arrives—Command directs T-2 to report to attic division.

E-5 arrives:

- Command directs E-5 to assume Division 2 and to do primary search and check for downward extension.
- Division 2 requests one additional company.

E-6 arrives:

- Command directs E-6 officer to assume vent group and perform horizontal ventilation where needed.
- Vent group requests one additional company.

R-1 arrives—Command directs R-1 to report to Division 2.

E-7 arrives—Command directs E-6 to report to vent group.
Activity 1.1:
Application of the Basic ICS Functions
Student Activity Worksheet

Time: 65 minutes

Purpose:
To provide you practice in using the components of the ICS structure to develop an appropriate organizational structure for an emergency incident.

Directions:
1. Work in small groups to review the scenario assigned. You will have approximately 35 minutes for group work.

2. Analyze the situation presented in your assigned scenario and develop an ICS organization appropriate for the situation and the resources involved.

3. Prepare an ICS organizational chart on an easel pad. Use only the ICS positions that have been discussed to this point:
   - Command;
   - Command staff (safety, information, and liaison);
   - Staging;
   - RIC;
   - Divisions/groups; and
   - Single resources, task forces, and strike teams. (You may use the resources typical for your area.)

4. Select a spokesperson to present your group’s results and a brief explanation to the class.

Scenario 1:
A two-story ordinary construction building has fire showing on Side A on the second floor. The occupancy is a 35’ x 75’ rooming/boarding house with a center corridor.
configuration. The first floor lobby area is 35’ x 18’. There is an open stair shaft behind
the lobby. The second floor fire room directly above the lobby is the same size as the
lobby. Both floors have heavy smoke conditions.

The building to the left (Exposure B) houses a credit corporation on the first floor and
small offices on the second floor. (The common wall between the two buildings is
directly behind the telephone pole on the outside.) The first floor is completely clear of
smoke. Heavy smoke shows from the second floor window. There are no exposures on
Sides C and D.

**Scenario 2:**
A two-story occupied dwelling with an attic fire.

**Notes:**
Activity 1.1:
Application of the Basic ICS Functions
Student Assessment Sheet

Group presentations:
You will notice variations in the ICS organizational structures developed by different groups. This diversity reinforces the point that ICS is flexible in its modular approach to handling incidents.

However, you should correct any under-management or over-management depicted on your organizational chart. Examples of under-management include organizations that exceed a reasonable span-of-control by failing to activate enough ICS elements or by failing to have critical functions in place. Over-management might be indicated by activating elements that are not required for the incident, such as operations, logistics, or finance.

Consider the following factors when developing your ICS organization chart:

- Proper terminology;
- Proper span-of-control;
- Proper protocol;
- “Normal” usage: no task forces, no strike teams, and no branches; and
- Placing all functions in boxes.

The benefits of this scene-management tool include:

- Logical organization of resources according to needs;
- Clear lines of authority and communication;
- Flexibility for different incidents and strategies; and
- Ease of use.
C O T C

Operations
The Operations Section (continued)

Staffing the Operations Section Chief Position

This position is staffed when command’s span-of-control is exceeded or when command, due to other concerns, cannot focus full attention on tactical operations.

Let’s look at a scenario of a major fire in a four-story garden apartment. The attic and fourth floor are heavily involved. There are additional complexities at this incident. This is a larger building and fire area. It is nighttime. There are 48 displaced families, and the complex is served by a dead-end water main, resulting in very poor water supply. It is February in a northern state. There is only one access road into the apartment complex. There is no vehicle access to the rear.

Four-Story Garden Apartment

Center Section 50- to 75- percent involved
4th floor and attic

Command is faced with many problems:

- Planning;
- Relocation of and care for displaced residents;
- Liaison with other agencies;
- Initial water supply problems;
- Logistics for fire and EMS units;
• Limited access to complex;
• No vehicle access to rear; and
• Nighttime fire.

Command chooses to staff the operations section chief position.

**E-1 arrives**—The officer gives a brief initial report and directs the E-1 crew to attack the fire with a 1 3/4-inch hose line from the fourth floor and conduct a primary search on that floor. The E-1 officer assumes command. Command requests a second and third alarm.

Command initiates Division 4, Division C, Division 3, vent group, and exposure group as the first and second alarm resources arrive.

**Chief 1 arrives**—Command is transferred, and the chief assigns the E-1 officer to operations. With the need to deal with the 48 families, the poor water supply, and access problems, command cannot continue to be involved with
tactics. Command must step back and handle those other problems while operations handles the tactics.

*We could have assigned the E-1 officer to planning/logistics, but our goal is to show how to establish operations. In addition, another chief officer arriving on the scene could have been assigned operations.*

**Incident Command System Organization Expansion**

For the four-story apartment fire, operations wants to add a Division 2 and a salvage group.

What has happened to the operations chief? The span-of-control now exceeds the optimal level. This cannot be justified before an incident is brought under control.

Command would have experienced the same span-of-control problem if the operations section chief had not been staffed. The span-of-control issue was not solved by staffing operations; it was simply passed on.
Branches

Depending on the magnitude and/or type of incident, the operations section may break the incident area into segments for management purposes. These segments are referred to as branches.

Branches are the IC’s or operations chief’s tool for correcting a span-of-control problem created by too many divisions and/or groups. California uses a branch for ground operations and another for air operations when responding to a large-scale brush fire. Few fire departments have a need for air operations, but the concept is a sound one. An emergency requiring firefighting and large-scale EMS operations would be conducive to the creation of separate branches. Large-scale disasters such as airplane crashes, floods, and earthquakes are excellent candidates for this level of organization.

The organizational chart above shows the result of creating branches on operations’ span-of-control. Did the exposure branch need to be created for span-of-control reasons?
Incident Command System Functions Normally Staffed

Normally, the functions are staffed in the following order:

1. Command,
2. Divisions and groups,
3. Operations section, and
4. Branch.

The other sections (planning, logistics, and finance/administration) are staffed as needed by the IC.

Complex Incident Branch Organization

When an incident is already complex as first units arrive and probably requires a large ICS organization, the initial IC should start organizing at the branch level instead of the division and group level.
The Planning Section

The planning section has six units or responsibilities. If command staffs the planning section chief position, all planning section responsibilities fall under the planning chief.

Resource Unit
The resource unit is responsible for tracking resources that have been requested, or dispatched, and ones that have arrived on location. On complex incidents, operations and divisions and groups also will have to track resources assigned to them.

Situation Unit
Just as important for planning is the collecting, tracking, and displaying of all information relevant to the status of the incident. This responsibility falls to the situation unit, whose
role is to predict where the incident is going and provide options for controlling it.

Documentation Unit
The documentation unit records and protects all documents relevant to the incident. These documents may range from incident reports to injury claims to overtime compensation reports.

Demobilization Unit (DEMOB)
The orderly, safe, and efficient demobilization from an incident requires appropriate planning. Timely release of resources is important in situations where costs may be a factor because of large numbers of varied resources. For this reason, the demobilization unit is a member of the planning staff.

Technical Specialists
Not all incidents involve firefighters. Some hazardous materials incidents, for example, require the highly
specialized skills of a chemist or other scientist. The need for specialized skills is compounded when the incident is of significant magnitude. To meet the planning requirements of these types of incidents, technical specialists are employed. In this category, they are advisors, but they can be assigned to other functions such as operations, a haz mat group, or other sections, as required.

The Logistics Section

The logistics section is responsible for ordering personnel, equipment, and resources required for incident control and response personnel support.

Given an incident of sufficient magnitude, logistics may be divided into two branches: a service branch and a support branch.

Service Branch
The service branch is responsible for all service activities at an incident. These services are handled using communications, medical, and food units.
Communications Unit
The communications unit develops plans for the effective use of communications equipment, distribution of equipment to personnel, supervision of the communications network, and the maintenance and repair of communications equipment.

Medical Unit
The medical unit handles the emergency treatment and transportation of incident personnel who are injured or ill at the scene. Although the primary responsibility is to incident personnel, this unit may be used to assist civilians on the scene. The medical unit is also responsible for firefighter rehabilitation. The rehabilitation manager reports directly to the medical unit leader.

Food Unit
The food unit is important to long-term operations. This unit is responsible for all feeding of the operational personnel.
Support Branch

The support branch is responsible for the development and implementation of logistics plans in support of the incident action plan. This responsibility is met through the efforts of a supply unit, a facilities unit, and a ground support unit.

Supply Unit

The supply unit orders equipment and supplies, receives and stores all supplies, and services nonexpendable supplies and equipment.

Facilities Unit

The facilities unit provides the layout and activation of fixed facilities for an incident. Such facilities might be the CP, sanitation facilities, and/or staging areas for supplies.

Ground Support Unit

The ground support unit handles the fueling of vehicles, the transportation of personnel and supplies, and the maintenance
and repair of vehicles and equipment. This unit also executes the demobilization plan developed by the planning section.

The Finance/Administration Section

Finance/administration consists of time, procurement, compensation/claims, and cost units.

Time Unit
The time unit is responsible for tracking personnel on- and off-duty time. In considering recent court rulings regarding work hours and overtime, this function can be important.

Procurement Unit
The procurement unit handles financial matters pertaining to vendor contracts.

Compensation/Claims Unit
Financial concerns over serious injuries and deaths as a result of an incident fall under the responsibility of the compensation/claims Unit.

Cost Unit
Finance/administration also has the responsibility for tracking cost data, analyzing the data, making cost estimates, and recommending cost-saving measures. These particular duties fall under the cost unit. The finance/administration section is also responsible for all legal matters at an incident.
Figure 1-1: Comprehensive ICS Organization Chart
Activity 1.2:
Using the ICS at a Major Incident
Student Activity Worksheet

Time: 90 minutes

Purpose:
To provide you practice in applying the full ICS organization and in developing an organizational structure for a major emergency incident.

Directions:
1. In small groups, role-play the part of an assistant chief who arrives at an emergency scene where multiple resource units are working. There is an obvious lack of command organization.

2. Analyze the situation and develop an ICS organization appropriate for the situation and the resources involved. All ICS positions are available for the activity.

3. Prepare an ICS organization chart on an easel pad and have a spokesperson present your group’s work to the class with a brief explanation.

Scenario:
Small groups represent an assistant chief who is dispatched with a third-alarm assignment to a fire in a two-story rooming house. Dispatch advises that the resources on the various alarms are as follows:

<table>
<thead>
<tr>
<th>1st Alarm</th>
<th>2nd Alarm</th>
<th>3rd Alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine 1</td>
<td>Engine 4</td>
<td>Engine 7</td>
</tr>
<tr>
<td>Truck 1</td>
<td>Engine 5</td>
<td>Engine 8</td>
</tr>
<tr>
<td>Engine 2</td>
<td>Truck 5</td>
<td>Engine 9</td>
</tr>
<tr>
<td>Engine 3</td>
<td>Engine 6</td>
<td>Truck 9</td>
</tr>
<tr>
<td>ALS-1 (Medic)</td>
<td>ALS-2 (Medic)</td>
<td>ALS-3 (Medic)</td>
</tr>
<tr>
<td>BC-1</td>
<td>BC-2</td>
<td>BC-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AC-1</td>
</tr>
</tbody>
</table>
On your arrival, you find that the following conditions exist:

- All first- and second-alarm resources have been committed and are working at various assignments as individual units.
- Engine 1, Engine 2, Engine 3, and Truck 1 are on the first floor attacking the fire and conducting a search.
- Truck 1 has reported that it has two civilians down and needs medical assistance. Engine 4, Engine 5, and Engine 6 are on the second floor fighting a fire and are asking for help to do a search.
- Truck 5 is on the roof attempting to ventilate and is asking for assistance.
- Units on the first floor are directing their radio messages to the IC.
- Units on the second floor and the roof are directing their radio messages to Battalion 2.
- Battalion 1 is at his or her vehicle, which is parked at the curb in front of the main entrance to the building.
- Battalion 2 reports that he or she is on the second floor and has found a civilian down in the hallway.
- ALS-1 and ALS-2 are parked at opposite corners of the street and are asking for assignments.
- The units responding on the third alarm either are asking for assignments or are reporting their locations through the radio.
- A lieutenant from the training division has arrived at the same time you have and is observing the activity.
- Incidents of this type normally draw several TV/newspaper reporters.
With the resources listed above, your group must develop an ICS organization that would be appropriate for this incident. You may relocate any resources you feel are necessary, but you cannot order any additional resources. Your group has 50 minutes to discuss the incident scenario and develop an ICS organization. Record the ICS organization on an easel pad and select a spokesperson from the group to present the work to the class.

Notes:
Activity 1.2:
Using the ICS at a Major Incident
Student Assessment Sheet

Group presentations:
Group spokespersons will have about 5 minutes each to review their groups’ results. You should notice variations in the ICS organizational structures developed by different groups. This diversity reinforces the point that ICS is flexible in its modular approach to handling incidents.

However, groups should avoid under-management or over-management. Examples of under-management include organizations that exceed a reasonable span-of-control by failing to activate enough ICS elements or by failing to have critical functions in place. Over-management might be indicated by activating elements that are not required for the incident, such as operations, logistics, or finance.

When constructing your ICS charts, consider the benefits of using the ICS organization at complex incidents, including:

- Flexibility,
- Control of multiple resources,
- Standardized terminology and procedures, and
- Clear lines of authority.
Incident Management

A successful incident operation requires the skills of a strong IC. During large complex incidents, lack of understanding of the command role causes more problems than any other single incident management problem. Without strong, central command, the typical incident quickly deteriorates into an out-of-control, unsafe, chaotic mess. This potential for chaos strengthens the need for one single individual to centralize command.

If command does not develop and communicate a plan, it can only be expected that everyone will take independent action. This is known as freelancing. What fire department can afford to operate in such an uncoordinated manner?

What is Command?

Command is taking charge of an emergency incident in a positive manner, developing strategic goals, and making decisions to implement specific actions that will bring the situation under total control. Effective command requires developing a plan (strategy), organizing the resources that will be used, directing the activities that take place, and coordinating the total operation to control the incident. At an emergency incident, these things must be done quickly and effectively because the nature of an emergency does not allow for the luxury of experimenting or doing things over.

A major element of being in command is that everyone recognizes who the overall IC is, and that everyone operating at the incident will follow and support the IC’s action plan. Basic agreement and support of subordinates are critical for success. Without agreement among participants, effective management coordination, control, or direction is impossible.

Commanding an emergency incident places an individual in a demanding situation with a high level of responsibility. The IC always faces the risk of death or injury to the operating or exposed civilian personnel. Incident personnel are always in
jeopardy when there is not a strong command in effect. When personnel are not part of a known plan and are not being monitored, it is inevitable that they will get lost, be placed in dangerous or hazardous positions, or will fail to use proper safety equipment.

It is both a personal and command responsibility to avoid this. Incident command is responsible for important safety decisions relating to building construction type and proper placing of firefighters. Case after case proves that when incident command is weak, firefighters get hurt or killed.

Problems Facing Command
The types of problems encountered during emergency incidents are the same regardless of the size of the department involved. The common denominator for solving problems is usually resources (personnel and equipment). Large-scale incidents can create serious restrictions for the smaller department with limited resources. The fewer the resources, the more critical effective fire ground management becomes to ensure that all problems are addressed and resources are not wasted.

Incident Command Leadership
When a command officer, the eventual IC, arrives at the scene of an emergency incident and announces that he or she is in charge, he or she assumes a moral and legal responsibility for actively managing the overall operation and for making plans and decisions that are necessary to bring the situation under control. Failure to become actively involved and to accept the responsibility for command because of a lack of confidence or ability can have a seriously negative impact on the outcome of the operation.

One of the most critical functions that the IC must perform is to determine strategic goals: what actions have to be taken and in what priority order to control the situation? When those determinations are made, it is the IC’s responsibility to assign the resources to meet the specific objectives.
Most emergency situations that fire departments respond to are small and handled without a written plan. Managing an incident without a plan can develop bad habits that have a negative impact on a large-scale incident when it is encountered. An IC should develop the habit of planning for every incident.

Without organization at an emergency incident, resource application and utilization can become very ineffective, and critical operations can be either overlooked or performed poorly. Communications play a vital part in all phases of an emergency situation and, in general, the better the communications, the better the outcome. Control over resources and activities is necessary from the standpoint of applying planned strategies and determining their effectiveness.

Determining what has to be done, when it has to be done, and who is going to do it is what incident organization is all about. The degree to which an IC is able to organize his or her thoughts, plans, and actions will be reflected in the manner in which the overall situation is handled. To be effective, organization must begin early. The longer an operation is allowed to run in an unorganized manner, the harder it is to establish order. If upper-level command officers are organized in their functions, their sense of direction will be reflected in the way subordinate officers operate.

Democratic leadership is not the way to run an emergency incident, and subordinate officers must understand that decisions related to overall strategy will be made by the IC. At any major emergency, support staff assistance is essential to the operation of the CP, and it helps avoid overloading the IC. These positions should be activated as the need becomes apparent.

Leadership at an incident scene must include the IC’s ability to make a reasonable prediction of occurrences such as structural collapse and probable backdraft or flashover, and to evaluate the effectiveness of the firefighting effort.
When this professional approach is fostered and used on a regular basis, the likelihood of casualties decreases. This is the goal toward which everyone associated with firefighting must strive.

**Command Decisions**

After initiating action, the IC assumes a management role to develop strategies that will be used during the incident. The responsibility for tactical decisions to implement the strategy must be delegated to subcommands. When assignments are given to subordinate officers, they should be objectives, not point-by-point orders. The emergency scene is dynamic, with many elements that require the IC to focus on the “big picture.” The IC cannot do that effectively if he or she micromanages every tactical operation. Personnel must be adequately trained to carry out the IC’s strategy.

Since the senior-level chief officer who assumes overall command responsibility for an emergency incident is seldom on the scene when control operations are first initiated, he or she must deal with strategic decisions that have already been made by subordinate officers, and either modify or expand them. Changes to basic strategy already in operation should not be made if the plan appears to be working. Making changes just to let people know you are in charge can cause serious confusion and completely negate any good that has been done. However, an IC should not live with an impossible situation that has been created before he or she arrives and must have the courage to reorganize an operation, even if it means going back and starting a new attack.

Many times the visual appearance of what is happening at an emergency incident, from the CP location, can be deceiving. Things may not be as bad as they seem; they could be a lot worse! Whenever possible, command decisions should be based on observations that are supplemented with information from someone who is in a position to report reliably on the situation.
While the general rule is that the best decisions are made with the most information, waiting to obtain an abundance of information can actually have a negative effect at the incident. Since time is a critical factor in controlling any emergency, waiting too long to make a decision can allow the incident to grow in size or complexity and create a condition that requires resources beyond those that are readily available.

**Critical Elements in Incident Management**

**Organization**

Reducing the overall situation or problem into manageable segments readily identifies what has to be done. Assigning specific responsibilities to subordinate command officers for various parts of the overall operation will reduce the workload of the IC and allow him or her to concentrate on managing the incident.

When incident operational forces are spread over a large area, the control factor becomes extremely important. Often the IC may never see all of the firefighters at the incident; therefore, the officer in charge must be responsible for and hold accountable the officers who are working within the organizational structure. When the span-of-control of any leader is exceeded, the ability of that leader to provide a safe operational area fails.

Operating within the chain of command is important to control at every emergency incident. Violating this principle can result in assignments not being carried out and duplication of effort. In many cases, it can jeopardize the safety of fire personnel.

Failure to follow unity of command breaks down incident coordination because conflicting orders are given and companies are not sure who is in charge.
Standard Position Titles

To help clarify roles within the ICS organization, standard position titles have been established. Each ICS level uses a different designator. The position title typically includes the functional or geographic area of responsibility, followed by a specific designator. The chart below shows the ICS levels, functions, and position designators.

<table>
<thead>
<tr>
<th>ICS Level</th>
<th>ICS Function/Location</th>
<th>Position Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command</td>
<td>Command and Control</td>
<td>Incident Commander</td>
</tr>
<tr>
<td>Command Staff</td>
<td>Safety, Liaison, Information</td>
<td>Officer</td>
</tr>
<tr>
<td>General Staff</td>
<td>Operations, Planning, Logistics, Finance/Administration</td>
<td>Section Chief</td>
</tr>
<tr>
<td>Branch</td>
<td>Varies (for example, EMS)</td>
<td>Director</td>
</tr>
<tr>
<td>Division/Group</td>
<td>Varies (for example, Div. A)</td>
<td>Supervisor</td>
</tr>
<tr>
<td>Unit/Crew/Strike Team/Task Force</td>
<td>Varies (for example, Rehab)</td>
<td>Leader</td>
</tr>
</tbody>
</table>

Communication

The ability to receive critical information needed to make decisions and to transmit orders to implement planned strategy is dependent upon the quality of communication between the IC and subordinate officers. It also significantly affects the coordination of various subcommands and the proper utilization of resources. Without effective incident communication, control will suffer.
Control

Effectiveness and control go hand-in-hand on the fire ground. If the fire ground commander is able to exercise a high level of control over all aspects of the operation, the chances for success increase.

Every emergency incident requires a strong incident command role. Every person involved in an emergency incident must realize that effective strategy and tactics, a workable action plan, and incident personnel safety are the functions of a strong IC. Weak or nonexistent command inevitably lead to unnecessary loss of life and property and injuries. There are few examples of fire companies without effective command acting in a coordinated manner to achieve strategic goals. It must also be remembered that no IC “goes it alone.” Subordinates must accept and understand the established role command plays and must support command efforts.

The proper handling of an emergency depends upon the IC, his or her abilities and skills, and the management tools at his or her disposal.

One skill that is neither discussed nor written about at length is command presence.

The term command presence describes a behavior that is easy to recognize, but very difficult to achieve. Officers with command presence display total control that is both recognized and respected by others in an emergency. Leaders display confidence by the manner in which they operate. They have earned credibility by their ability to command, and they possess the self-discipline required to devote total energy and attention to the job at hand.

We have seen the officer who does not have command presence. The symptoms are talking loudly, shouting orders, using profanity to emphasize the importance of the task, or behaving dysfunctionally—such as running back and forth without actually achieving any given goal. When officers are
in charge and lose control of themselves, the consequence is that they have very little control over the emergency: they lack command presence.

**Command Presence**

Very few chief officers have achieved a level of personal development in which they always demonstrate command presence. Even the most seasoned chief fire officers lack command presence at one time or another in their careers. When officers respond to an emergency, the situation is in progress and growing. Conditions will deteriorate unless someone takes control and stabilizes the emergency. Remember, the emergency is happening to another individual or group, and you did not cause it. Your job is to stabilize it, and everyone is looking to you for a solution.

Under high-stress circumstances, when the situation is beyond control in a short time, the mind speeds up in hopes of compressing the decision-making process into a time reference that is acceptable. This compression is not always possible. When an incident exceeds all resources or places you in a position of making short-term critical decisions with long-term impacts, you have to be prepared. You must be disciplined, confident, and competent. In other words, you must display command presence. You must make sure that the incident is handled in the most effective manner possible. It is vital to the professional development of the fire service that individuals who are accountable for managing incidents look upon themselves as the solution.

As an officer, you must display confidence and be in control at all times. You must remain calm, speak clearly with steadiness and authority, and be disciplined enough to accomplish the task. Remember that the discipline of command presence, or the obvious lack of it, can be contagious.

Some people believe that command presence goes with the job. Once you are promoted, you have it. You know this is
not so. Promotion does not guarantee the kind of behavior we are talking about.

Who are those leaders with command presence? What are the qualities of an officer who displays this behavior? He or she is unquestionably in charge, competent, composed, cool under pressure, dignified, decisive, a problem-solver, goal-oriented, and self-confident.

As an officer, you want to develop these qualities. It is important for your people to see you as a commander who has command presence. Fortunately, command presence behavior can be identified, practiced, and developed. Most of you, at the positions you have achieved, probably have many qualities that contribute to your command presence. Identifying these qualities and fine-tuning them can help you become a more effective officer.

Consider the following suggestions:

- **Get as much education and training as possible.** Individuals feel more in control of a set of circumstances when they are knowledgeable about the short- and long-term effects of decisions they make. Become more knowledgeable about building construction, fire behavior, management methodology, people, incident tactics, and strategies. It is just as important for the officer to understand the anatomy of an emergency as it is for a physician to understand human anatomy in order to diagnose and treat patients.

- **Review and study incident case histories.** Do not confine yourself to your own department; the experiences may be limited. Study trade magazines and case histories in textbooks. Discuss incidents with other officers—what they did or what they would have done differently.

- **Take various problem buildings in your community and imagine yourself in different emergency scenarios.** Think through how you would manage and react in each
situation. Running through a sort of mental dress rehearsal is one of the best ways to develop a frame of reference. Remember that this mental exercise is a very important part of training for Olympic and professional athletes.

- **Listen to your voice on tape under stress.** When you are in stressful situations, your voice may become high-pitched or develop tremors. You can correct this with practice.

- **Consider how you direct emergency operations.** Do you use sound management practices? If your method of directing an operation appears to be somewhat unorganized or illogical to you, imagine how it appears to people who work for you.

- **Practice command presence at small incidents.** Two- or three-company operations provide excellent opportunities to improve skills in a minimal stress environment and without a great degree of risk.

- **Examine your demeanor toward the people who work for you.** Do they think of you as their commanding officer? Are you concerned for their safety and welfare? Do you make decisions that consider their well-being?

- **Consider your management and supervisory style in routine nonemergency activities.** Do you portray a demeanor that has earned you the respect of your subordinates? Do they view you as their commanding officer?

- **Evaluate your appearance and the image you project.** Do you seem to be in control? Do you look as if you are in command?

- **Study someone who already has command presence.** To paraphrase the old get-rich-quick scheme, if you want to learn how to be in control, study someone who is good
at it. This use of role modeling is a way to short cut the time it takes to develop your own style.

- **Maintain good physical condition.** Under stress, individuals perform better when their bodies can absorb the physical effects of stress with a minimum amount of impact.

When a person is easily debilitated, mental processes begin to deteriorate. There is a term for this—neurasthenia. Neurasthenia can occur when an individual has been exposed to stress for a long period. It is characterized by vague functional fatigue and the inability to make proper and accurate decisions.

As you can see, command presence is very difficult to define but impossible to overlook. It can’t be bestowed, like a badge or a promotion. It isn’t embedded in a body of knowledge, to be attained simply by taking a class. Rather, it is the result of many factors that go into the professional development of an officer. The lack of command presence erodes the public’s confidence in the fire service. Its presence establishes trust and credibility for our profession.

### Assuming Command

**Confirmation of Command**

The confirmation of command is a major part of the first IC’s function and provides a definite act at the beginning of operations to verify that command has been established. The initial announcement that command is in place and operating not only assures a quick up-front command, but also requires the IC to commit a conscious act (personally) and a standard act (organizationally) by formally announcing he or she is the IC.

This informs all other responders, arriving and operating, that command is in place. This approach coordinates the assumption of command by a single IC; if others try to
assume command, they will realize immediately the need to narrow the field to one.

If no one announces that he or she is in command, the entire system realizes that the command function is not yet in place and operating.

Everyone arriving at the incident after command has been assumed will automatically be in one of three basic categories:

1. Work under command,
2. Take command if passed, and
3. Formally transfer command to IC.

**Identification of the Incident**

Department SOGs may vary, but the first officer assuming command should identify the incident by stating, “E10 will be 7th Avenue IC.” All emergency incidents where fixed command will be established should be named in a manner that will clearly identify the location. This reduces confusion on the radio and establishes a continuous identity for others who may later assume the command role.

When anyone needs to talk to the IC, they request 7th Avenue IC, and whoever is holding that position will answer. There can only be one 7th Avenue IC at a time, so there is no confusion about who is in charge of the incident. Use of normal radio numbers tends to confuse command issues.

**Officer’s Responsibilities**

At an emergency incident, the entire hierarchy of a fire department is turned upside down on initial arrival. Unlike the day-to-day management operations of an organization, the company officer and his or her crew, who reside at the bottom of the organizational hierarchy, normally arrive at an emergency incident first. Command officers normally arrive in reverse order of their respective positions in the
department’s rank structure. What this does, in effect, is place the authority to act at an emergency initially at the lowest level. The first fire officer on the scene is in charge until relieved by a superior officer. The first officer who assumes command has a responsibility to develop and maintain an unbroken line of authority from whoever is in charge. Someone always must be in charge at an incident and everyone should be aware of who that person is.

The first officer assuming command at an incident will encounter a tremendous range of tasks. He or she must assess the situation, determine incident priorities, give company orders, place other companies and, if necessary, call for help. Usually, the first-in company on most incidents is an engine company. Regardless of the type of emergency, the first officer on the scene is the “boss” for the moment.

In cases where the first-arriving officer is a chief officer, he or she automatically assumes a normal command position and begins command responsibilities. On a typical first-alarm assignment consisting of several companies, most departments require that command be assumed automatically by the chief officer upon arrival. The officer who is relinquishing his or her authority should give the chief officer an assessment of conditions.

When a higher-ranking officer arrives at the scene of an emergency incident and takes charge, he or she assumes moral and legal responsibility for actively managing the overall operation and for making plans and decisions that are necessary to bring the situation under control. Failure to become actively involved and to accept responsibility for command due to a lack of confidence or ability can have seriously negative impact on the outcome of operations.

**Assuming Command of Incident Operations Already Underway**

Assuming command of incident operations already underway is in some ways more difficult than commanding an operation from its inception. It is sometimes more difficult to change
tasks when companies have been committed than it is to commit initially. A common error of an IC is to allow an unsound operation to continue because of the difficulty of changing it, or because of reluctance to change what the subordinate officers have ordered.

The IC must realize that:

- The situation has developed further and is more apparent than when the subordinate initiated operations; a change in operation is less of a reflection upon subordinate’s judgment and ability than it might appear to be; and

- Sound principles of incident stabilization must be carried out in any event, and changes in operation must be made when necessary.

Prolonging an unsound operation will only compound the difficulty of correcting it.

Less complex situations and those in which command is assumed early in the operation may present fewer problems to the officer assuming command. However, if the following sequence of actions is followed, it will become an automatic procedure and will prove invaluable when the officer is faced with a serious and complex situation.

The officer must become skilled in performing each step rapidly so that the procedure will be an efficient tool when needed:

1. Size up the situation as if you were the first officer arriving at the scene.

2. Confer with the officer in command. Have him or her brief you on the actions taken and his or her assessment of the situation. This conference should be short and to the point.
3. Determine the objective of your operation. What are you trying to accomplish?

4. Consider available resources:
   - What do I have?
   - Where is it going?
   - What’s in the way?
   - How do I control them?

5. Consider the objective; review operations taking place:
   - Are essential tasks being carried out?
   - Are there tasks in progress which must be halted or modified?
   - Are tasks being poorly supervised?

6. Assume command and take appropriate action.

At an emergency incident, the responsibility of command must be assumed. It may be a single assignment of one company with a company officer in charge, or a multiunit dispatch with a company officer in charge until the arrival of a higher ranking officer who will assume command. In any situation, confirmation of command and identification needs to be accomplished.

**Transfer of Command**

**Command Transfer Rationale**

On a typical first-alarm assignment consisting of several companies, command is usually passed automatically from the company officer to the senior officer as soon as he or she arrives. This is the procedure followed by most departments.
There are other reasons for transfer of command. As situations become more complex, problems of maintaining control increase rapidly. When more and more fire companies are assigned to an incident, their tasks are more difficult to coordinate. Effective coordination of personnel is the primary objective of span-of-control techniques. Span-of-control refers to the number of firefighters or companies that an officer can supervise or coordinate effectively with a minimum loss in communication between himself or herself and those whom he or she is commanding. No officer is expected to supervise more than five or six subordinates.

As more units are sent to the incident, they will eventually overwhelm the IC. The IC must divide his or her responsibilities and reduce the span-of-control.

Another reason for transfer of command is when the command abilities of the IC have been exceeded. This can occur at a complex incident which is beyond the training and experience of the IC. The incident problems may be too complex for the IC. He or she must be prepared to face this dilemma and be able to relinquish the command function to a more experienced and knowledgeable officer.

**Transfer of Command Method**

Transfer of command also takes place at those emergency incidents where multiple agencies become involved. For example, many agencies will be working at a train derailment where hazardous materials are involved. The director of emergency management or the state police may be in overall command, according to local jurisdictional laws.

Transfer of command should be accomplished through an accepted and workable method. The method will vary from department to department. Many fire departments have developed operational guides that stipulate the command process. For example, in some departments, the next highest ranking officer arriving at an incident is automatically in
command, and specific information must be relayed to the new commander.

One of the most important aspects in command transfer is the accurate and complete exchange of incident information. Before the new IC can take any effective action, he or she must gather as much information as possible about the incident operation. En route, he or she will be assessing the situation from the information heard on the radio, what he or she personally knows about the building or type of incident, and what he or she observes on arrival.

The officer who is transferring command needs to give the new IC the current situation status: tactical priorities, action plans, what has been accomplished, assessment of effectiveness of operations, update of the current RESTAT, apparatus and personnel deployed, what resources are in staging, and what additional resources will be needed. Specifically, the new IC needs to be briefed on any hazardous or potentially hazardous conditions to emergency personnel.

From these sources of information, the new IC can assess the situation and take appropriate action.

This information exchange may take only seconds to accomplish. The transfer of command may be done by radio, but the most effective method is face-to-face. When communicating face-to-face, the new IC not only hears what is occurring, but also can observe. It is much easier to convey information when the person on the receiving end can see the facial expressions, hand gestures, and other nonverbal messages the IC is sending out. In addition, the IC is better able to tell if the message is being received.

As an incident is stabilized, the transfer of command does not decrease, but continues in descending order. As the incident winds down, there are many functions that need to be accomplished before returning a building back to its owners. The remaining aspects of the action plan need to be
accomplished and resources demobilized and returned to service.

Transfer of command in descending order requires a briefing, exchange of information, and current situation and resource status report, not unlike when transfer of command occurs as the incident is escalating.

**Passing Command**

Passing command is a methodology that can be used by the first-in company officer to give command to the next arriving unit, company, or chief.

A company officer is allowed to pass command only under a precise set of guidelines. The company officer must determine that his or her direct involvement in incident operations will have a significant impact on the outcome of the incident. For example, a three-person company arrives and a rescue situation from a second floor window must be accomplished immediately. The officer must help the firefighter get the ladder in position to assist with victim recovery. The company officer should pass command to the officer of the next arriving unit.

This is done by simply stating, “Engine 1 passing command to Engine 2.” DO NOT forget to get an acknowledgment from Engine 2.

Engine 2’s officer cannot assume command until his or her unit arrives on scene and Engine 1’s officer is contacted by radio that Engine 2 is assuming command. This transmission allows the Engine 2 officer to mentally transition from the “order taker” mode to the “order giver” mode. This process helps the Engine 2 officer get ready to give additional orders to other companies on arrival.
Establishing a Command Post

At every emergency incident there is a need for an operational “field office.” It may simply be a company officer as the IC in the front seat of his or her pumper, and the driver as his or her staff. As an incident grows in magnitude and complexity, the necessity becomes greater. As multiple units respond to an incident, there must be a central location from which the IC can manage. This “field office” is similar to the office back at the station where management functions take place.

Command Post Rationale

The CP is where management functions occur: planning, directing, staffing, coordinating, controlling, and evaluating. As an incident grows in complexity, resource needs increase, problems escalate, and span-of-control becomes unmanageable, the CP provides a location from which to manage. It becomes the nerve center for the incident, where information is disseminated and received. The company officer who may have established the initial CP transfers command responsibility to a ranking officer. The CP staff increases as the incident functions increase. The potential and complexity of the incident will dictate the size of the CP.

The CP established for large and complex incidents gives the IC a “field office,” which will allow for:

- A place to think and make decisions;
- A vantage point from which to see;
- A place to write and record;
- Lighting for night operations;
- Reference/preplanning material for information;
- Communications resources;
• Space for staff assistance; and
• Stationary position to maintain composure.

For example, in a structure fire there are several basic functions that need to be addressed by the IC and staff: communications, operations, planning, logistics, water supply, safety, medical needs, public information, collecting data and keeping records of significant events, and assignments of personnel to line and staff functions.

The CP is another management tool that addresses the safety of emergency personnel by tracking location and status of working units and personnel. It also allows for keeping records of exposure time of personnel.

**Command Post Location**

The CP should be located in a position that gives the IC a good view of the incident and surrounding area, yet does not hinder apparatus movement and operations. The CP should be in a conspicuous location where incoming emergency personnel may find it easily. If possible, locate the CP in front of the incident. There may be incidents where the CP does not allow a view of the operations, such as a high-rise fire or a hazardous materials incident where the CP may be half a mile upwind, or in a major brush fire.

The CP may be located in an officer’s car or fire apparatus. It may be located in a building across the street from the incident. Many fire departments today have specially designed vehicles that function as a CP.

The CP site or vehicle should have adequate working space and be out of the weather, with lights and communication capability. If the incident is a long campaign, food, sanitation, and sleeping facilities may be needed.

The IC must discipline himself or herself to stay at the CP and manage the incident from that position. The entire
management system—particularly with the decentralization of command into subcommands and divisions, and ongoing communications from every area—is designed to support and assist the IC who is operating from a stationary location. The CP also standardizes the location of the IC and eliminates the very common questions, “Who is in charge?” and “Where’s the chief?” When a CP is established, everyone knows where the IC is, how to contact him/her, and what he or she is doing.

If the IC needs to leave the CP, he or she must leave someone there who can make decisions in his or her absence.

**Command Post Equipment and Identification**

When the CP is established, the IC must report his or her location to dispatch, operating units, and incoming units. If the location is changed, all units and dispatch must be notified. The CP should be identified so that it is easily recognized. This can be done by using a special colored light or flag designation on the CP vehicle.

The equipment needs of a CP will vary with incident size. Many departments have developed basic CP kits for command vehicles. These kits may include status boards, notebooks, portable lights, pre-incident plans, resource lists, reference books, and identification vests for command staff, general staff, and other ICS positions.

Each fire department should have SOGs for a CP. The SOG should detail how the CP will be organized and what functions must be carried out.

At every incident, there is a need for some type of operational CP. The complexity of the CP will escalate as incident potential escalates.

The CP is where management functions occur at an emergency incident. The CP should be located where it is visible, yet not in the way of operations. It needs to be identified by a particular designation such as a flag or
specified color of light. When the CP is established, everyone knows where the IC is, how to contact him or her, and what he or she is doing.

Module Summary

We have examined a model ICS in its entire spectrum. Such a system is useful not only on large operations but also can and should be applied to any incident regardless of size or type.

A close examination of various incidents should reveal that nearly all the functions and duties discussed thus far have been carried out. The key point to remember is that all functions are carried out at every incident. It is the size and/or type of incident that dictates the degree to which each function is addressed. The resources available in terms of personnel will dictate how many functional responsibilities can be delegated.

Another vital consideration is training. Simply delegating a function or responsibility does not guarantee success in carrying out the appropriate responsibilities. All fire officers must be thoroughly trained in the ICS used by their departments. They must continually practice and refine related skills to ensure a credible command presence and effective leadership at the incident scene.
MODULE 2

SLIDES
Chief Officer Training Curriculum

Operations
Module 2:
Incident Command Decision-Making

Objectives

- Identify the difference between classical and naturalistic decision-making
- Determine whether to use the classical or naturalistic method at a particular incident
- Size up and identify at least three incident problems and the cues used to detect them

Objectives (continued)

- Determine at least three incident objectives and three strategies to address the incident
- Determine at least three tactics to carry out to complement each strategy
Overview

Focus is to:

♦ Consider process of thought to empower officers to make quick decisions
♦ Establish foundation for future decision-making throughout incident

Overview (continued)

♦ Explain and reinforce difference between classical and naturalistic decision-making
♦ Present command sequence as outline for officers to follow when developing and implementing an action plan using the classical method

Incident Scene Decision-Making

Two primary methods:

♦ Classical
♦ Naturalistic
Classical Method

Decision-maker:
- Gathers information
- Analyzes information
- Determines problems present
- Determines and prioritizes solutions
- Selects tactics
- Issues directives to implement tactics

Classical Method (continued)

Classical method used during:
- Training for incident type not previously learned
- Evaluation of other decision-makers to
  - Determine obvious and subtle differences
  - Provide optional conclusions
  - Provide cues for actions not to direct

At incident scene, decision-maker:
- Must not direct tactical actions until formulates basic plan
- Must base plan on critical cues
- Must apply best specific solutions (tactics)
Naturalistic Method

Decision-maker:
- Looks for critical cues
- Relates those cues to previous similar situations
- Recalls previous conclusions, results, and actions
- Issues directives

Naturalistic Method (continued)

Almost instant recall:
- Interrelationships of specific information with conclusions, results, and actions
- Direct link from senses to action

The brain always attempts the naturalistic method first.
Classical Versus Naturalistic

Use classical method when:
- No experience or too little training
- Incident cues are very unfamiliar
- Lost, overwhelmed, or in a panic

Command Sequence

Incident priorities:
- Life safety
- Incident stabilization
- Property conservation

*These priorities are often accomplished simultaneously.*
Command Sequence (continued)

Step 1: Size-up
Identify the problem

Ops 2-16

Command Sequence (continued)

Step 2: Determine strategy and select tactics

Ops 2-17

Command Sequence (continued)

Action plan:
Who takes action when and where

Ops 2-18
**Command Sequence (continued)**

Step 3: Implement the action plan
Directives to resources—**who, when, where**

![Diagram showing Command Sequence]

**Performing tactical operations:**
Companies and crews perform tasks

![Diagram showing tactical operations]

**Action Planning**

*What are the benefits of action planning?*
Size-Up

Thinking stage:
- Phase One: pre-incident information
- Phase Two: dispatch through on-scene size-up
- Phase Three: ongoing size-up

Pre-Incident Information

Definition: critical cues known or gathered before incident that may affect decisions or actions
- More than you see through the windshield
- Wealth of information available

Target Hazards

Is target hazard preplanning effective?
Dispatch Through On-Scene Size-Up

IC identifies problems:
- Calmly assesses incident conditions
- If IC doesn’t identify problems, may apply wrong solutions
- Identifies potential hazards to firefighters

(continued)

When relieving the initial IC, the command officer must:
- View “big picture”
- Re-evaluate resource needs
- Evaluate strategy-tactics
- Evaluate changes in incident conditions

Sizeup Factors

- Water
- Apparatus/personnel
- Life
- Location/Extent
- Area
- Construction
- Exposure

- Weather
- Auxiliary Appliances
- Special Hazards
- Height
- Occupancy
- Time
Dispatch Through On-Scene Size-Up (continued)

Information sources:
- Dispatchers—provide valuable incident information
- Your knowledge base—what you know about area structures, water supply, etc.
- Information from people on scene—fire and police personnel and civilians

Ongoing Size-Up

- Continuously evaluate incidents
- May identify new problems
- Ask, “Is what we are doing solving the problem at the scene?”
- Re-evaluate critical cues and modify plan where needed
- Look for things that can go wrong

Activity 2.1

Using Size-up to Identify Problems
Determining Strategy

Strategy:
- Defines the “what” of the solution
- Is basis of action planning
- Evolves from identified problems
- Gives direction
- May have multiple components

Lloyd Layman’s Seven Strategies

- Rescue
- Exposures
- Confinement
- Extinguishment
- Overhaul
- Ventilation
- Salvage
Determining Strategy (continued)

A strategy indicates that you have:

♦ Gathered and assessed critical cues
♦ Identified problems
♦ Evaluated resource requirements
♦ Begun planning

Activity 2.2

Determining Strategy

Ops 2-34

Ops 2-35

12
Selecting Tactics

Tactics are:

♦ Operations that will accomplish the strategy
♦ The “how, who, where, and when” of the solutions to problems
♦ Prioritized in order by IC
♦ Measurable

Centralized control/decentralized execution:

♦ IC responsible for decision and results
♦ Line officers supervise tasks
♦ Firefighters deploy resources

Risk/benefit analysis:

♦ Accept no unnecessary risks
♦ Accept risk only when benefits outweigh costs
Incident Action Planning

Addresses all phases of incident control within specific time
Ensures successful outcomes in that time
Must be completed in time that allows least amount of negative action to occur

Incident Action Planning (continued)

Objectives
Strategy
Tactics
Support actions
  Water supply
  Utility control
  SCBA cylinders

Implementation of plan:
Plan not always complete when give orders
Directives define objectives to complete to achieve goals
IC needs sufficient resource information to achieve results
Incident Action Planning (continued)

Effectiveness:
- Continuous size-up process
- Gather and analyze information
- Modify and update plan based on progress reports of current conditions

Activity 2.3

Action Planning
Unified Command

More than one possible authority on scene:

♦ Goals and strategies may differ
♦ Objectives, strategies, and tactics may conflict

Unified Command (continued)

Crisis Management—Terrorism

♦ Law enforcement function—identify, acquire, and plan resources to anticipate, prevent, and/or resolve terrorist threat or act

Unified Command (continued)

Consequence Management—Terrorism

♦ Emergency management function
  – Protect public health and safety
  – Restore essential government services
  – Provide emergency relief
Unified Command (continued)

All agencies contribute to:
- Determining overall response objectives and strategies
- Ensuring joint planning
- Ensuring integrated operations
- Maximizing use of resources
- Keeping track of financial costs

Activity 2.4

Classical Versus Naturalistic Decision-Making
Module Summary

- Commanders must understand when to use classical or naturalistic decision-making method
- Command sequence has three steps and three outcomes
- Challenge is to gather, process, prioritize, and make decisions based on rapidly changing cues
MODULE 2

INCIDENT COMMAND
DECISION-MAKING
MODULE 2:

INCIDENT COMMAND DECISION-MAKING

Objective
Upon completing this module, you will be able to apply the classical or naturalistic decision-making methods in the size-up process to identify incident objectives and strategies.

Methodology
This module uses lecture, discussion, and activities.

NFPA 1021 Standards Cross-Reference Matrix
3-6, 3-7, 4-6, 4-7
Introduction

This module explains and reinforces the difference between classical and naturalistic decision-making (previously called recognition-primed decision-making). Naturalistic decision-making is a process in which extremely fast decisions are made. The process is dependent on the experiences and training of the decision-maker.

The classical method of decision-making is used when the incident type presents cues with which the decision-maker has little or no experience. The incident requires a set of reactions that the decision-maker has not experienced or learned before the incident occurs.

The command sequence is presented as an outline for officers to follow when developing and implementing an action plan using the classical method of problem-solving. The focus on this module will be to consider a process of thought that will empower the officer to make quick decisions, and more importantly how to establish the foundation for future decision-making throughout an incident.

Incident Scene Decision-Making

Two primary methods are used by incident scene decision-makers to reach conclusions, determine results, and institute actions:

• Classical and

• Naturalistic.

Classical Method

The classical method is a time-consuming process. The decision-maker:

• Gathers information;
• Analyzes the information;
• Determines the problems that are present and selects and prioritizes those problems in order of importance;
• Determines and prioritizes what the solutions must be;
• Selects tactics from one or more options; and
• Issues directives to have the tactics implemented.

Classical Process
The classical process is used when the decision-maker is in training:

• Being taught the critical cues, conclusions, results, and actions for an incident type not previously learned, or learned incorrectly (for example, an urban or city fire officer learning wildland firefighting decision-making from a wildland expert);

• Evaluating and comparing the critical cues used, conclusions and results determined, and actions taken by other decision-makers (for example, case studies):

  * To determine obvious and subtle differences;

  * To provide optional conclusion, result, and action sets based on those differences; and

  * To provide cues that would indicate that certain actions should not be directed.

The classical process is used during evaluation and planning when time is not a factor. The decision-maker looks for the best solution to a problem.
**The Classical Process at the Incident Scene**

The classical process is needed when the decision-maker is at an actual incident scene and there has been little or no previous experience or training with this specific incident type or little or no previous experience or training with an incident with the variables that are now present.

The decision-maker must not direct tactical actions until a basic plan has been formulated. A process that does not include an evaluation of the incident information, risk-benefit analysis, and appropriate strategies and tactics, is not a plan—it is a design for disaster.

The plan must be based on incident information (critical cues), real problems and appropriate broad solutions (strategies), and the best specific solutions (tactics) must be applied and, most often, these tactics will be chosen from several options.

**Naturalistic Method**

The naturalistic method is a process in which the decision-maker:

- Looks for certain critical cues (visual, verbal, touch, smell);

- Relates those critical cues to previous similar situations (experience or training);

- Recalls the previous conclusions, results, and actions that best fit the new situation; and

- Issues directives to have the tactics implemented.

The greater the experience on the same type of incident, the greater one’s ability to read the subtle differences at any incident of that type, draw refined conclusions, and direct the most appropriate actions to provide a solution.
It is obvious that basing decisions on understanding from previous experience can produce action results much faster than following a step-by-step intellectual process.

**Naturalistic Process**

Where the decision-maker has adequate experience or training for the incident type, he or she will use the naturalistic method.

The naturalistic method is the normal way the brain works. It will always try the naturalistic method to solve any problem or answer any question.

The naturalistic method is an almost instantaneous recall of previously learned information. It includes the interrelationships of specific information with conclusions, results, and actions based previous experience. Therefore, it provides a direct, lightning-fast link from what a person sees, hears, smells, and feels to what he or she concludes or how he or she behaves. The decision-maker looks for a solution that satisfies an immediate need.

Because of the time-pressured nature of emergency-scene decision-making, the choice between naturalistic and classical methods will not be conscious. The decision-maker’s brain will always attempt the naturalistic method first.

**Classical Versus Naturalistic**

The decision-maker must recognize when he or she possesses insufficient information to use the naturalistic method and should use the classical method:

- If it is obvious that there has been no experience or too little training on the specific incident;

- If the incident cues are very unfamiliar and do not immediately result in what he or she considers appropriate action; or
• If he or she feels lost or overwhelmed, cannot think, or panics.

The decision-maker will use the classical method to evaluate naturalistic actions that have been ordered in a specific situation to ensure that what is being done is achieving the desired results.

The NFPA has a definition of decision-making; in short, decision-making is a continuous process by all incident management team members from start to termination. Decision-making is continuous size-up. The commander asks, “Is what I have directed to be accomplished actually solving the problems at the incident?”

The Classical Thought Process—The Command Sequence

The command sequence process is composed of three action steps. They are:

1. Sizing-up the situation,
2. Designating strategies and tactics, and
3. Implementing the action plan.

Each step has a specific outcome:

1. Identifying the problem,
2. Developing Incident Action Plan (IAP), and
3. Performing the tasks.

Incident Priorities

The incident priorities define the mission. All strategy and tactics must be conceived within the boundaries of the mission. The incident priorities are:
• Life safety,

• Incident stabilization, and

• Property conservation.

Size-Up
Size-up is the gathering and recognition of information cues and includes:

• Assessing the situation and

• Directing the first action.

Size-up is the analysis and comparison of incident cues and is the basis for problem identification. These problems must be identified to set incident priorities. Problem identification is the first outcome.

Establishing Objectives
Objectives are statements of guidance and direction. They are based on realistic expectations and are measurable.

Determining Strategies and Selecting Tactics
Strategy is the “what” of the solution: What must be done to solve the problem? Tactics are the “how” of the solution: the specific action that must be performed. Designating strategies and tactics is the second action step.

Action Plan
The action plan delineates “who” takes the action and “when” and “where” the action takes place. The action plan includes the determined strategy and selected tactics. The action plan is the second outcome.
Implementing the Action Plan
Resources need to know their parts of the plan. Directives are issued to the resources delineating their parts of the plan, the “who,” “when,” and “where.” Implementing the action plan is the third step.

Performing Tactical Operations
Companies perform specifically learned manual tasks that, when completed, achieve or help achieve a tactic. Performing operations is the third outcome. Performance of tactical operations cycles back into the first action step: size-up.

Benefits of Action Planning
It is critical that the IC have a plan of action before tactical operations start. The benefits of action planning are:

- Making firefighters think before they act;
- Helping keep the IC in a proactive mode; and
- Helping to assure that critical cues are not overlooked.

Action planning can be used at any type of incident because it provides a logical thought process to follow.

Continuous Size-Up
The command sequence is continuous; size-up continues throughout the incident. If the IC suspects that an incident will carry over into another operational period, then it is critical that formal incident action planning begin early in the process.

After the first cycle ending at tasks, the IC should re-evaluate the actions taken, that is, continue size-up. This continued size-up affords an opportunity to see where and how the action plan should be modified.
Size-Up

Size-up is the gathering and analysis of incident information (critical cues) that provides the basis for problem identification. This is the thinking stage. Three phases comprise this stage:

- Phase One: pre-incident information,
- Phase Two: dispatch through on-scene size-up, and
- Phase Three: ongoing size-up

**Phase One: Pre-Incident Information**

Size-up is more than what you see through the windshield when you arrive at the scene. Pre-incident information is factors (critical cues) that are known or gathered before the incident that may have an impact on decisions or actions.

A wealth of information is available before alarm, for example, preplan documents (occupancy information and water supply), environmental conditions, information about the response area, departmental resources, and interagency/private sector assistance.

**Target Hazards**

One type of emergency that you can plan for is one at a community target hazard.

- A target hazard is a specific occupancy that poses a special concern to a fire department.

It can be defined in different ways, depending on the community where it resides. Communities can have the same type of occupancy (for example, a school), yet in one community it isn’t a target hazard, but in another community it is.
A target hazard is also defined by a fire department’s ability to deal with a fire at the hazard. For example:

* A senior citizen’s complex in a town where a fire in the complex has never occurred may be a target hazard.

* A town with a similar complex and experience fighting fires in this type of occupancy may be better prepared, both mentally and organizationally.

- Factors that contribute to calling an occupancy a target hazard include:

  * A fire department’s ability to deal with a fire (for example, experience with the type of emergency or frequency of occurrence);
  
  * A fire department’s response time;
  
  * Distance from a water source;
  
  * Code enforcement (or lack of);
  
  * Type of building occupants (for example, elderly, small children, physically and mentally disabled persons, trained/untrained staff, and number of occupants); and
  
  * Building construction (for example, highly flammable materials [or not] and egress types [revolving doors versus double doors, locked versus unlocked doors, and wide versus narrow hallways]).

Pre-incident information is valuable because it:

- Helps the IC understand what has happened;
- Helps identify problems and understand what is happening;

- Helps the IC predict what will happen;

- Helps the IC to understand resource needs;

- Assists the IC in development of strategies and tactics;

- Helps the IC identify tactical operations that may be necessary; and

- Helps the IC identify safety considerations.

**Phase Two: Dispatch Through On-Scene Size-Up**

Phase two is a rapid gathering and mental evaluation of various factors (critical cues) related to a specific emergency incident.

The first objective is to identify problem(s). The IC must try to assess conditions calmly. If you do not identify problems before you take action, you may apply the wrong solution. Potential hazards to firefighters should be identified.

When relieving the initial IC, the command officer must:

- View the “big picture;”

- Re-evaluate resource needs;

- Evaluate current strategies and tactics;

- Evaluate changes in incident conditions; and

- Evaluate probability of escalation.

The acronym **WALLACE WAS HOT** can be used for training on the factors that affect size-up.
**Water**

**Area**

**Life**

**Location/Extent**

**Apparatus/Personnel**

**Construction**

**Exposures**

**Weather**

**Auxiliary appliances***

**Special hazards**

**Height**

**Occupancy**

**Time**

*Standpipes, sprinklers, heat detectors, for example.

The **WALLACE** part of the acronym is best used for training to include all factors. All factors are not critical at every incident, nor does this represent all of the factors to be considered.

Preplanning is best way to gather size-up information. At the incident scene, all factors are in a constant state of change.

Information sources for this phase include:

- Dispatchers, who provide valuable incident information;
- Your knowledge base—for example, what you know about the area, structures, and water supply; and
- People on scene, including fire and police personnel and civilians.

**Phase Three: Ongoing Size-Up**

Incidents are dynamic, and the IC must evaluate the situation continually. He or she may identify new problems that require solution as an incident escalates or de-escalates.
The IC must evaluate actions taken. He or she must ask, “Is what we are doing solving the problems at this scene?” A re-evaluation of the critical cues may indicate that the action plan must be modified. A pessimistic view is required. The IC must look for things that can go wrong. Murphy’s Law applies here also.

**Cycle of Size-up**

Primary factors are the conditions and elements that should be recognized and evaluated on arrival and during the course of the incident. Secondary factors are the activities undertaken to achieve objectives. (See the sample Primary Factor Size-Up Chart on the following page.)

Any decision that you make will have an impact on any or all of these factors. Conversely, decisions that you do not make will allow for further impact on other factors. A good decision that is timely is far better than a perfect decision that is made too late.
<table>
<thead>
<tr>
<th>Primary Factor Size-Up Chart</th>
<th>Incident Objectives Attainable/Measurable/Flexible</th>
<th>Activities (Strategies)</th>
<th>Evaluate Effect of Activities (Strategies) Every 10 Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P = Pertinent</strong></td>
<td><strong>NP = Not Pertinent</strong></td>
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<tr>
<td><strong>Factors</strong></td>
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<td>Life Hazard</td>
<td>Occupants</td>
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<td></td>
<td>Personnel</td>
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<tr>
<td>Location/Fire</td>
<td>Fire Bldg/Exposures on Arrival</td>
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<td>After Arrival</td>
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<td></td>
<td>Radiation/Conduction/Convection</td>
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<tr>
<td>Construction</td>
<td>Fire Building</td>
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<td></td>
<td>Exposures</td>
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<tr>
<td>Occuacncy (Contents)</td>
<td>Fire Building</td>
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<td></td>
<td>Exposures</td>
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<td>Height</td>
<td>Fire Building (Front/Rear)</td>
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<td></td>
<td>Exposures (Front/Rear)</td>
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<td>Area</td>
<td>Fire Building/Configuration</td>
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<td></td>
<td>Proximity of Exposures/Config.</td>
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<tr>
<td>Structural Collapse</td>
<td>Fire Building</td>
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<td></td>
<td>Exposures</td>
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<td></td>
<td>Collapse Zone</td>
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<td></td>
<td>Apparatus Placement</td>
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<tr>
<td>Weather</td>
<td>Visibility</td>
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<td></td>
<td>Temperature/Humidity</td>
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<td></td>
<td>Wind – Direction/Velocity</td>
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<tr>
<td>Resource Requirement</td>
<td>Apparatus/Personnel/Equipment</td>
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<td></td>
<td>Water Supply/Suppression Agent</td>
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<tr>
<td>Auxiliary Appliances</td>
<td>Fire Building/Exposures</td>
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<td></td>
<td>Exposures</td>
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<tr>
<td>Topography</td>
<td>Street Conditions</td>
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<tr>
<td>Explosions</td>
<td>Flash Over Conditions</td>
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<td>Back Draft</td>
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<tr>
<td>Duration of Operations</td>
<td>Rest - Rehab</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List Incident Objectives:
1. Safe Removal of All Occupants.
2. Contain and Control Fire.
4. Other.

List Incident Strategies
1. Identify alternative strategies for firefighter safety when occupant safety has been determined not to be a Primary Factor.
2. **Rescue**
   - Interior/Exterior/Both
   - Effective
   - Not Effective
3. **Exposure Protection**
   - Exposure Examination
4. **Confine/Extinguish**
   - Hose Line Replacement
5. **Overhaul**
   - Expose Hidden Fire
6. **Ventilation**
   - Removal of Occupants
   - Fire Control
7. **Salvage**
   - Water – Run-Off
   - Apply Covers
   - Forcible Entry
   - Location
   - Method
   - Special Equipment
   - Imaging Cameras
8. **Assign To:**
   - 1.
   - 2.
   - 3.
   - 4.
   - 5.
   - 6.
   - 7.
   - 8.
   - 9.
   - 10.
Using the Primary Factor Chart

1. Column 1 - Primary Factors
2. Column 2 - Major Objectives
3. Column 3 - Incident Strategies
4. Column 4 - Evaluate Strategies

**Step 1 - Analyze the Primary Factors**
- Indicate the pertinent Primary Factors in Column 1 left side

**Step 2 - Establish Major Incident Objectives**
- List the Major Objectives in Column 2

**Step 3 - Identify Incident Strategies**
- List Incident Strategies in Column 3 (upper)

**Step 4 - Assign Incident Strategies**
- Indicate unit or units assigned to the Strategy in Column 3 (lower)

**Step 5 - Evaluate Incident Strategies**
- At 10 minute intervals re-evaluate the Primary Factors and the effects of the Strategies on these factors in Column 4

**** Always identify alternative strategies for firefighter safety when occupant safety has been determined not to be a primary factor.
Activity 2.1: Using Size-Up to Identify Problems
Student Activity Worksheet

Time: 20 minutes

Purpose:
To identify the appropriate critical cues and the incident problems identified through those cues.

Directions:
1. You will work in small groups. The instructor will show a slide of a strip shopping center fire.
2. Each group will be in the role of the first-in officer.
3. Each group will quickly determine the problems that are suggested by the critical cues and complete the checklist on the Student Activity Worksheet.
4. Each group will have a spokesperson report its findings as called upon.

You will have 10 minutes to work on the checklist.

Scenario:
The slide shows a strip shopping center. Flames showing from a drug store indicate a 25 to 50 percent involvement. The time is 1045 hours, Sunday. It is 50° F and calm.

Heavy fire and smoke are showing from the front of the drug store.

The drug store is adjacent to a vacant commercial unit (Side B) and a furniture store (Side D). See the following plot plan/floor plan.
## Checklist

<table>
<thead>
<tr>
<th>Factor</th>
<th>Cue</th>
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<tbody>
<tr>
<td>Water</td>
<td></td>
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<tr>
<td>Area</td>
<td></td>
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<tr>
<td>Life</td>
<td></td>
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<tr>
<td>Location and extent</td>
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<tr>
<td>Apparatus and personnel</td>
<td></td>
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<tr>
<td>Construction</td>
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<td>Exposures</td>
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<td>Weather</td>
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<td>Auxiliary appliances</td>
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<td>Special hazards</td>
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<tr>
<td>Height</td>
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<td>Occupancy</td>
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<tr>
<td>Time</td>
<td></td>
</tr>
</tbody>
</table>
## Problems Identified

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

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SM 2-22
Establishing Objectives and Determining Strategy

Objectives
Objectives are statements of guidance and direction that are necessary to the selection of appropriate strategy(s) and the tactical direction of resources. Objectives are achievable and measurable.

Strategy
Strategy is the overall plan used to control the incident. Strategy defines “what” must be done to provide a solution to the problems.

The determination of strategy is the basis of action planning. Strategy evolves directly from incident problems and is the beginning of the solution. It gives direction to get you from where you are to where you want to be. Strategy may have multiple components to gain control of an incident.

Lloyd Layman’s seven strategies (RECEO VS) may be used to assist in the strategy development.

- Rescue
- Exposures
- Ventilation
- Confinement
- Salvage
- Extinguishment
- Overhaul

A well-defined strategy gives personnel an understanding of the IC’s plan and helps them accomplish it. Only after strategy is developed can the IC begin to formulate an action plan.

Having a strategy indicates that you have:
- Gathered and assessed critical cues and identified problems;
- Evaluated resource requirements and availability; and
- Established priorities and begun planning.
Activity 2.2:
Determining Strategy
Student Activity Worksheet

Time: 15 minutes

Purpose:
To build on the information in Activity 2.1 and produce a list of applicable strategies for the incident.

Directions:
1. You will be shown a slide of the fire situation from Activity 2.1. Each group will assume the role of the first-in officer at the incident. Your group will be allowed 5 minutes to:
   - Review the problems identified in Activity 2.1:
     * From preplan—the building is ordinary construction.
     * Fire is probably in the attic/roof assembly.
     * Flashover in this area has occurred (visual).
     * Fire possibly in adjacent occupancies (previous experience or training and construction).
     * Fire possibly in walls (previous experience or training and construction); and
   - Determine the strategies that are applicable to the first-in officer. This means not concerning yourself with overhaul and salvage.

2. Select a spokesperson to report your group’s findings when called upon.

3. Write the applicable strategies for the incident on the following page.
Scenario:
The slide shows a strip shopping center. Flames showing from a drug store indicate a 25 to 50 percent involvement. The time is 1045 hours, Sunday. It is 50° F and calm.

Heavy fire and smoke are showing from the front of the drug store.

The drug store is adjacent to a vacant commercial unit (Side B) and a furniture store (Side D). See the following plot plan/floor plan.

Applicable Strategies
Selecting Tactics

Tactics are the operations that must be successfully completed to accomplish the strategy. Tactics based on strategies will guide the companies/crews in their required operations. They are the “how” of the solutions to the problems. Tactics are measurable and specific and can be completed within a designated time.

The IC prioritizes the order in which tactics will be accomplished. Effective and efficient tactical operations require that a fire officer allow for centralized control with decentralized execution. In other words:

- The IC is responsible for the decision and the results;
- The line officers will be responsible to supervise the tasks; and
- Firefighters will deploy the resources

Allowing for decentralized execution frees the IC to think ahead and continue to size up the situation. The chief officer must learn to trust that the tactics are being properly deployed to fit the strategies and goals. Micromanaging tactical operations will remove the ability to think strategically.

As the responsible party, you must at this point conduct a risk/benefit analysis considering the following points:

- Accept no unnecessary risks and
- Accept risk only when benefits outweigh the costs.

Incident Action Planning

Action planning ensures an organized course of events that addresses all phases of incident control within a specific time. Action planning is necessary to effect successful outcomes,
especially in emergency operations, in a timely manner. Planning must be completed in a timeframe that allows the least amount of negative action to continue.

The action plan includes objectives, strategies, tactics, and support actions. Strategies are broad in nature and define what has to be done. Tactics are selected by the IC or the operations section chief. Tactics are the signposts along the path to where you want to go. They answer “how” and “where” and are measurable both in time and in performance. Support actions are those actions necessary to make the plan operable (for example, water supply, utility control, and Self-Contained Breathing Apparatus (SCBA) cylinder fillings).

**Implementation**

Once the Incident Action Plan (IAP) is developed, the IC may start issuing directives and committing resources. Action plans are not necessarily completed before orders are given. Directives define objectives that must be completed to achieve the action plan goals. The IC needs sufficient information for resources to achieve positive results effectively.

**Effectiveness**

The continuous size-up process ensures effective action planning. You must gather and analyze information, and modify and update the plan based on progress reports of current conditions from operational and management units.
Activity 2.3:
Action Planning
Student Activity Worksheet

Time: 30 minutes

Purpose:
To build on the information developed in Activities 2.1 and 2.2 and produce appropriate tactics for the selected in Activity 2.2.

Directions:
1. The instructor will show the slide of the strip shopping center fire from Activity 2.1. Each group will assume the role of the first-in officer at the incident. Your group will be allowed 15 minutes to:
   - Review the strategies that were identified:
     * Rescue—do a primary search of the other uninvolved occupancies.
     * Confinement/Extinguishment—confine the fire to the area of origin, check for extension in walls and roof, and complete extinguishment.
     * Ventilation—provide vertical and horizontal ventilation that will assist with confinement and extinguishment.

2. Quickly determine the tactics that must be completed to accomplish the strategies.

   Resources are:
   - Three, four-person engines,
   - One four-person truck,
   - One ambulance, and
   - One chief officer.

3. Write your group’s strategies and tactics on the page provided.
Scenario:
The slide shows a strip shopping center. Flames showing from a drug store indicate a 25 to 50 percent involvement. The time is 1045 hours, Sunday. It is 50°F and calm.

Heavy fire and smoke are showing from the front of the drug store.

The drug store is adjacent to a vacant commercial unit (Side B) and a furniture store (Side D). See the plot plan/floor plan.
Strategy 1:  

Tactic:  

Strategy 2:  

Tactic:  

Strategy 2:  

Tactic:
Unified Incident Command Strategy

Authority
A critical point that must be made concerning your role in decision-making is that you cannot expect to be the only responsible authority on the scene. The goals and strategies of fire officers might differ from other emergency responders. The reality to understand is that the fire service does not always work within a vacuum.

During incidents that require multi-agency and multiple disciplinary responses, the chief officer may assume that:

- Other size-up considerations are occurring simultaneously and from a different perspective and
- Therefore, objectives, strategies, and tactical operations might conflict.

Special Note on Terrorist Incidents

Consequence management and crisis management are old terms no longer supported in the National Response Plan (NRP). Although the requirements of these functions continue to be performed in response to terrorist incidents, they are combined in the NRP that superceded the Federal Response Plan (more on this in Module 12).

- Crisis management - predominantly a law enforcement function and included measures to identify, acquire, and plan the use of resources needed to anticipate, prevent, and/or resolve a threat or act of terrorism.

- Consequence management - predominantly an emergency management function and included measures to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses, and individuals affected by the consequences of terrorism.
Unified Incident Command Rationale

Unified incident command rationale and concept arise from a need that is created by incidents that have no regard for jurisdictional or functional boundaries. All agencies with a stake in the operation, and the requirement and expectation of the public to make decisions in their best interest, will have the opportunity to contribute to the process of:

- Determining overall response objectives and strategies;
- Ensuring joint planning;
- Ensuring integrated operations are conducted;
- Maximizing use of assigned resources; and
- Keeping track of financial costs.

Unified command:

- Facilitates consensus decision-making by limiting the amount of time spent arguing over who is in charge;
- Focuses decision-makers on objectives that ensure specific employee safety concerns are balanced with public need; and
- Requires that the fire officer interject their identified problems, objectives, strategies, and strategies into a unified set of goals, for example:
  
  * Advanced life support may not begin until such time as victims can be extricated to a safe location, or
  
  * Firefighters might not be able to rescue a victim until law enforcement officers can render a facility safe for entry.
Activity 2.4:
Classical Versus Naturalistic Decision-Making
Student Activity Worksheet

Time: 20 minutes
Purpose:
To show you that you use naturalistic decision-making on familiar incidents where you have a relatively good understanding of the cues and that you must use classical decision-making on an incident where you have a poor understanding of the cues.

Directions:
1. You will be shown a slide of an incident. Working individually, without any discussion, you will:
   • Look at the slide for no more than 5 seconds; and
   • After 5 seconds, immediately begin to write the tactical orders that you would issue to three engines, one truck, and one ambulance company for this incident.

2. You will be shown a second slide of an incident. Working individually, without any discussion, you will:
   • Look at the slide for no more than 5 seconds and
   • After 2 seconds, immediately begin to write the tactical orders that you would issue to three engines, one truck, and one ambulance company for this incident.

3. The instructor will lead a short discussion on the methodology and the tactical order results.

4. Write tactical orders for the scenarios on the following page.
Tactical orders for scenario one:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Tactical orders for scenario two:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Module Summary

Naturalistic decision-making is a process in which extremely fast decisions are made. The process is dependent on the experiences and training of the decision-maker. The decision-maker relies on reading critical cues from the incident, comparing those critical cues to previously witnessed or learned critical cues, and reacting to those critical cues in a manner previously witnessed or learned. For highest efficiency, the decision-maker must know what critical cues are most important for the specific situation and the most effective specific response to each critical cue. For example, if one learns the correct critical cues, but learns the incorrect response to those critical cues, the decisions made will be flawed and the most correct and efficient solutions will not be applied. Naturalistic decision-making is extremely rapid and is the desired method for emergency operations.

The classical method of decision-making is used when the incident type presents cues with which the decision-maker has little or no experience. The incident requires a set of reactions that the decision-maker has not experienced or learned before the incident occurs. In this situation, the decision-maker must process information by reading the cues, compare those cues to what has been learned from similar situations, arrive at a conclusion or result by hypothesizing, determine the actual problems and strategies for the incident, evaluate and select the most effective tactics, and implement the action plan. Having completed this process, and if the resulting actions are successful, the decision-maker, in future similar situations, will simply use the naturalistic decision-making method to reach the desired conclusions and results.

The command sequence is a sequence for officers to follow when developing and implementing an action plan using the classical method of problem-solving. By following the command sequence, officers are forced to think before they act. The starting point for this process has traditionally been the size-up. Newly promoted chief officers must realize that size-up is not a means to an end, nor is it a step that will be taken and then left incomplete. It is the starting point of a
continuous *process*. In fact, size-up will continue throughout the entire incident.

As part of this size-up, the chief officer must be able to make quick and appropriate decisions based on pre-established priorities. This need to make irrevocable, life-altering decisions is what separates the chief fire officer from nearly all other professions.
MODULE 3

SLIDES
Chief Officers Training
Curriculum

Operations
Module 3:
Incident Action Plan
(IAP)/Planning

Objectives

♦ Identify units within the planning section
♦ Identify the roles and responsibilities within each unit
♦ Explain the planning process

Overview

♦ Planning section is the “nerve center” of successfully organized incident
♦ Intuitive mental process—small incidents
♦ More conscious thought process—major disasters
Overview (continued)

Commanders:
- Use assistant to document resources and record this placement/actions
- Require input from technical specialists:
  - Haz Mat
  - US&R
  - Environmental issues

The Planning Section

Section responsibilities include:
- Collection, evaluation, and dissemination of tactical information

The Planning Section (continued)

Other section responsibilities include:
- Preparing incident-related documentation
- Collecting incident information / intelligence and developing an action plan
- Providing a primary location for technical specialists
The Incident Action Plan (IAP)

- Planning’s documentation unit responsible for preparing IAP
- ICS requires a plan for every incident

The Verbal IAP

- Simple (or small) incidents of short duration
- Developed by the IC
- Communicated to subordinates through verbal briefing
- Typically used for every response

The Written IAP

- Complicated (or large) incidents of long duration
- Incidents of an unusual nature
- Two or more jurisdictions involved
- Several incident organizational elements have been activated
The Written IAP (continued)

- Contains command decisions
- Provides clear statement of objectives and actions
- Prepared for specific operational period

Operational Periods

Duration determined by:

- Time needed to achieve tactical objectives
- Availability of fresh resources
- Environment
- Personnel safety

IAP Development

Develop early enough to ensure:

- Completion of written plan
- Availability and briefing of additional resources
Planning Section Chief

- One of four general staff positions appointed by and reporting to the IC
- May have a deputy
- Determines need to activate/deactivate planning section units

Planning Section Units

Four primary units exist:
- Resource
- Situation
- Documentation
- Demobilization

Resource Unit

- Maintains status on all resources (equipment and personnel) assigned to incident
Situation Unit
- Collects and processes information on the current situation
- Prepares situation displays and summaries
- Develops maps
- Provides projections for future situations

Documentation Unit
- Prepares IAP
- Maintains accurate, up-to-date incident files (on incident-related documentation)
- Provides duplication services

Demobilization Unit
- Ensures orderly, safe, and cost-effective movement of personnel
- Develops incident demobilization plan
- Single-agency and/or smaller incidents may not require written plan or demob unit
- Larger incidents require demob unit established early
Technical Specialists

- Report to and work within Planning Section
- May be reassigned wherever needed
- Often assigned to situation unit (if needed for short time only)
- May have own unit established

Information and Intelligence Unit

- Appropriate in an incident with some need for tactical intelligence
- When no law enforcement entity is a member of the Unified Command

The Planning Process

- Includes all steps taken by IC to produce IAP
- Begins with rapid planning effort of initial response IC
- Improved by implementing formalized steps and staffing needed for IAP development
Applying ICS to an Incident

Apply ICS when:
- Planning for event or possible incident
- Reacting to unexpected event or incident

Planned Events/Possible Incidents

Easiest to prepare for
- Planners:
  - Must know as much as possible about event
  - Build an organizational structure to meet need
  - Establish exactly what is required—before event

Planning Stage

Considerations include:
- Type of event
- Location/size/duration
- Single or multi-agency
- Single or multijurisdiction
- Command staff needs
- Kind, type, number of resources
Planning Stage (continued)

Considerations include:
- Staging areas
- Other required facilities
- Kind and type of logistical support
- Known limitations or restrictions
- Communications available

Unexpected Major Incidents

- Most common
- Characterized by:
  - Time pressure
  - Scarce/specialized resource needs
  - Rapid expansion of incident
  - Overloaded communications
  - Incomplete information
  - Inexperienced on-scene staff

Unexpected Major Incidents (continued)

- Staff experienced in control but inexperienced in expanded incidents
- Require immediate action
- First-responding units take initial steps to provide organization
Any Incident

- Size up the situation
- Determine if human life at immediate risk
- Establish immediate objectives
- Determine number and kind of resources
- Develop action plan

Any Incident (continued)

- Establish initial organization
- Consider span-of-control limits
- Ensure personnel safety
- Determine environmental issues
- Monitor work progress
- Review/modify objectives (and adjust plan)

Transfer of Command

Incoming IC is briefed and performs assessment of incident with initial response IC.
Incoming IC Briefing

Covers:
- Incident history
- Initial priorities and objectives
- Current plan
- Resource assignments
- Incident organization
- Resource ordering/needed

Incoming IC Briefing (continued)

Covers:
- Facilities established
- Status of communications
- Constraints or limitations
- Incident potential
- Delegation of authority

Command Worksheet/Initial Written IAP

- Verbal for small, uncomplicated incidents
- Command worksheet at the Bn.
- Chief vehicle on larger, complex or unusual incidents
Command Worksheet/ICS Form 201

Contains the following information:
- Map sketch
- Summary of current objectives and actions
- Current organization
- Resources summary

ICS Form 201

- Is used on initial attack wildfires
- Serves the same purpose as the command worksheet
- Used to move from a verbal to written IAP
- Only IAP used for first operational period

Expanded, Written IAP

- For large, complex, or unusual events
- Many ICS functional groups contribute
- Initial IC may have started
- Composed of series of ICS forms
Transferring Command

- Method #1:
  - Incoming IMT briefed by initial IC
  - IMT then takes over the incident
- Method #2:
  - Incoming IMT phases in for several hours; then takes over the incident

Transferring Command (continued)

- Method #3:
  - Incoming IMT sits in on present team’s planning meeting
  - IAP preparation takes place jointly
  - New team briefs and takes over next operational period

Unit/Activity Log

- Every resource maintains this log
- Documents individual unit actions to:
  - Assist in developing after-action report
  - Justify state and Federal financial reimbursement
- Collected during demobilization
Incident Action Plan Cycle

Consists of eight sequential steps:
1. Understanding situation
2. Establishing incident objectives
3. Developing tactical direction and resource assignments
4. Conducting planning meeting

Incident Action Plan Cycle (continued)

Consists of eight sequential steps:
5. Preparing plan
6. Conducting operations briefing
7. Implementing plan
8. Evaluating plan

Understanding the Situation

Involves knowing:
- What has occurred
- Progress made
- Effectiveness (of current plan)
- If incident will expand (or get smaller)
- Present (and future) resource and organizational needs
Developing Control Objectives

Incident Priorities:
- Life safety
- Incident stabilization
- Environmental protection
- Property conservation

Lloyd Layman’s Seven Strategies

RECEO VS
- Rescue
- Exposures
- Confine
- Extinguish
- Overhaul
- Ventilation
- Salvage

Establishing Incident Control Objectives

Objectives must be:
- Attainable
- Measurable
- Flexible and broad
Sample Control Objectives

- Mitigate, stabilize, or isolate all hazards that could cause personal injury within city limits
- Evacuate all residents from projected flood area by 1400 hours
- Search all damaged structures within city limits for casualties by 1600 hours

Control Operations (Work Assignments)

- Work assignments that need to be accomplished by operations resources to complete a control objective
- Can be written as a strategy—answers *what* needs to be done
- Can be written as a tactic—answers *how* it will be accomplished

Developing Control Operations

- The operations section chief collaborates with the IC on control objectives
- Develops the control operations (work assignments) to achieve the control objectives
Developing Control Operations (continued)

Control operations:
- Developed around specific operational period
- Must have measurable results

Developing Control Operations (continued)

State control operations in terms of accomplishments that can be achieved realistically within the operational period.

Resource Assignments

- Assign for each specific work task
- Consist of kind and number of resources needed to achieve tactical operations
Sample Control Operations

For “mitigate, stabilize, isolate all hazards that could cause personal injury”:
- Control operations #1: Haz mat units monitor damaged properties for flammable or hazardous material leaks—take corrective actions
  Or...
- Control operation #2: First responders use fire line tape to isolate damaged properties that could cause further serious injury

Sample Control Operations (continued)

Or...
- Control operation #3: Stabilize all unsafe structures that will require entry by the public or incident personnel
  Or...
- Control operation #4: Structural engineers shall identify unsafe structures for entry and provide technical assistance on staging.

Conducting a Planning Meeting

Purpose: to capture information to develop IAP for next operational period
Conducting a Planning Meeting
(continued)

♦ Planning section chief leads meeting
♦ Usually held twice daily:
  - 0900 hours
  - 2100 hours
♦ Decisions driven by operations section requests

Meeting steps:
1. Brief on situation and resource status
2. Set control objectives
3. Plot control lines, establish division boundaries, identify group assignments
4. Specify division tactics
5. Specify division/group resources
6. Specify operations facilities and reporting locations
7. Place order for resources and personnel
8. Consider communications, medical, and traffic plan requirements
9. Finalize/approve/implement IAP
Operational Planning Worksheet

- Developed to support planning process
- Used in planning meeting to develop tactical assignments and needed resources
- Used to prepare resource request for next operational period
- Often enlarged for meeting use

Conducting a Planning Meeting (continued)

_Before_ the meeting, IC or unified command negotiate use of resources, strategies, and costs.

Preparing the Plan

- IMT sections adjourn to complete their portions of plan
- Documentation unit responsible for preparing and duplicating IAP for each operational period
Preparing the Plan (continued)

Seven essential elements of IAP:
♦ ICS Form 202
♦ ICS Form 203
♦ ICS Form 204
♦ ICS Form 205
♦ ICS Form 206
♦ Incident Map
♦ Traffic Plan

ICS Form 202

ICS Form 203

Organizations List (ICS 203)  Medical Plan (ICS 206)  __________________
Assignment List (ICS 204)  Incident Map  __________________
Communications Plan (ICS 205)  Traffic Plan  __________________
Preparation of the Plan (continued)

- Completed forms sent to planning section, which assembles document
- All forms to planning no later than 2400 hours (or 1200 hours for the day shift)
- By 0400 hours, IC should review/approve plan

Preparation of the Plan (continued)

- Planning section prepares copies of IAP
- Distributes at next operations briefing
- At a minimum, copies provided down to division/group level

Preparation of the Plan (continued)

- IAP documents everything oncoming shift needs to know
- Oncoming shift reviews new IAP with off-going shift at the shift change
Conducting an Operations Briefing

- Written IAP reviewed at operational briefing with oncoming shift
- Typical for two operational periods to exist
  - Two, 12-hour operational periods per 24-hour day

Conducting an Operations Briefing (continued)

Off-going shift attendees include:
- IC
- General staff
- Command staff
- Key technical specialists
- Communications unit leader
- Situation unit leader
- Other positions (as requested by IC)

Conducting an Operations Briefing (continued)

Oncoming shift attendees include:
- IC (still the same person)
- General Staff
- Command Staff
- Branch, division, group, and unit overhead personnel
- Technical specialists
- Agency representatives
Operations Briefing Agenda

16 basic items:
1. Introduction/welcome
2. Incident objective
3. Incident activities (past operational period)
4. Current and predicted weather
5. Incident boundaries, division breaks, group locations, drop points, etc.

Operations Briefing Agenda (continued)
6. Division assignment lists
7. Incident radio communications plan
8. Safety message
9. Medical plan
10. Air operations summary

Operations Briefing Agenda (continued)
11. Incident logistics issues
12. Incident finance/administration issues
13. Agency representative’s issues
14. Media and incident information issues
15. Technical issues (by technical specialists)
16. Conclusion and direction of operations personnel to respective briefing sites
Implementing the IAP

- **Small** incidents:
  - IC responsible for implementing *verbal* plan
- **Large** incidents:
  - General staff responsible for implementing portions of *written* plan

Implementing the IAP (continued)

Following operations briefing:
- Oncoming shift division/group supervisors:
  - Receive their briefings
  - Relieve the off-going supervisors
- Oncoming supervisors:
  - Brief and put to work resources assigned to their areas (using the IAP)
  - Use IAP mostly for reference thereafter

Evaluating the Plan

If personnel find deficiencies, they:
- Improve directions
- Provide additional resources
- Modify tactical operations
- Make changes to the next operational period

*The operations section chief may change tactical operations to accomplish an objective.*
Planning for Incident Demobilization

- For small (day-to-day) incidents, demobilization planning:
  - Is relatively simple
  - Does not require a written plan
- Larger incidents require a written plan

Incident Demobilization (continued)

Release priorities:
- Determined by all organization elements
- Made only after full understanding of long-term incident needs

Pre-Incident IAPs

- If anticipated, IMT should have pre-incident IAP completed before disaster
- Document fleshed out/completed after IMT briefed by initial IC
Pre-Incident IAPs (continued)

- May have for every type of major incident/disaster
- Can be loaded into computer-based IAP programs

Activity 3.1
Pre-Incident Planning

Activity 3.2
Incident Action Planning
Module Summary

- Preparation and pre-incident planning ensure all contingencies have been anticipated and use of resources maximized
- Major incidents require fully expanded ICS organization

Module Summary (continued)

- Written plan critical to ensure objectives, strategies, and tactics communicated to all incident personnel
- IAP not only communicates incident objectives but provides for safety and support of personnel
MODULE 3

INCIDENT ACTION PLAN (IAP)/PLANNING
MODULE 3:

INCIDENT ACTION PLAN (IAP)/PLANNING

Objective
Upon completing this module, you will be able to develop an Incident Action Plan (IAP) for a planned event or possible incident and an unexpected incident.

Methodology
This module uses lecture, discussion, and activities.

NFPA 1021 Standards Cross-Reference Matrix
3-6, 3-7, 4-6, 4-7
C O T C

Operations
Overview

For a command level firefighter, there are few things in life more satisfying to be part of than a well-run major incident or disaster response. If a post-incident analysis were to be performed on a well-managed incident, you most likely would find a command fire officer who committed the time necessary to train a management team to function in the leadership positions of a fully expanded Incident Command System (ICS) (while first responders were well trained at tactics and task levels).

The Incident Command System

The frequency of major disasters or large-scale incidents, lasting a week or in some cases months, are on the increase. The ICS, designed for large-scale wildfires in the 1970’s, has been improved over the last quarter century to become an all-risk system for managing every type of incident that can possibly strike a community.

The fully expanded ICS has been used to bring order out of chaos in hurricanes, tornados, earthquakes, floods, winter storms, and heat waves, and it was even used at the Oklahoma bombing.

On September 11, 2001, even the largest fire department in the country was overwhelmed by the massive logistical, planning, and financial problems that followed the collapse of the World Trade Center towers. After a few days of managing the incident on its own, even the New York City Fire Department accepted the assistance of a type one incident management team from the U.S. Forest Service. Within a few short hours, the first written incident action plan was developed, and the incident became more organized.

The Expanded ICS

More and more communities are seeing the wisdom of becoming more familiar with the expanded ICS, and many
fire departments have gone so far as to develop an incident management team that is trained in all of the ICS functions so they can better manage their incidents from the onset. The expanded ICS has proved to be an ideal tool for managing major incidents and natural and man-made disasters, and it can work in your community as well.

The Planning Section

All of the sections in the ICS organization (operations, planning, logistics, and finance/administration) play major parts in the overall success of managing a major disaster. The section that is found at the center of a successful incident organization is the planning section.

The planning process takes place during every incident responded to by a firefighter. It may be as simple as an Emergency Medical Services (EMS) call requiring delivery of a basic medical evaluation (In this case, patient information is collected, and upon return to the station, a report is completed that brings the incident to a close).

Another example might be the response of a single engine company to the report of a trash fire. On arrival, the Company Officer (CO) advises the dispatch center that personnel are on scene at a dumpster fire. No structures are threatened, and the officer reports that the incident will be taken care of in 10 minutes. On return to quarters, the officer completes the required report, and the incident is closed.

As simple as they may seem, in both cases a level of experience was used to understand the scope of the problem, determine a course of action, identify the resources required, execute the plan of action, and complete the required documentation.

This process seems simple to those in the business who do this as part of their daily routine. Actions required become intuitive, that is, very little conscious thought is expended to bring these emergencies to a successful conclusion.
As simple as these two examples are, both required developing a plan of action. In both cases, the plan of action most likely was conceived mentally and very few verbal commands were used to set them in action. As an incident grows in complexity, the need to use a planning process will grow with it.

Multiple-alarm incidents usually cause the intuitive mental process to give way to a more conscious thought process. The need for documentation during the incident also increases.

At this level, the district or battalion commander still develops a mental plan and issues orders verbally, but most likely will use an assistant to document responding resources and record their placement and actions. The assistant may complete this task using a pad of paper and clipboard or a large preprinted command sheet located at the command vehicle.

This gathered information will be used by the IC to help make strategic and tactical decisions on the incident, track resources, maintain firefighter accountability, brief arriving resources, and develop the after-action reports.

When a large, complex, or unusual incident occurs (for example, a large industrial or commercial structure fire, hazmat, US&R, or wildland incidents), most departments roll out the command vehicle that brings additional staff and needed support to better manage the incident.

This level of support and documentation is all that is required for almost every incident that the organization will encounter.

However, most fire departments face the possibility of a major event lasting at least several days. These incidents come with complex problems that require the establishment of broad objectives, strategies, resource management requirements, and support functions that are not included in normal, day-to-day emergency activities. Simply rolling out the command vehicle and staffing it with marginally trained
personnel will not meet the needs of the department or the community it is responsible for protecting.

A large-scale incident could come in the form of a large public assembly, such as a parade, sporting event, or convention where a terrorist attack or civil disturbance is possible, or a natural disaster that is anticipated, such as a flood, tornado, or hurricane. It could also be an event that strikes the community without warning, such as a terrorist event, earthquake, wildfire, or other natural or man-made event.

It was for these large-scale potential disasters that the expanded planning process and the written Incident Action Plan (IAP) were developed.

Departments that are not familiar with the IAP must understand that even organizations that use the written IAP frequently on large-scale incidents such as wildfires do not usually develop a full written plan unless the incident is large enough to extend over multiple days.

The written IAP usually takes hours to produce and requires formal meetings with all of the leadership and agencies having responsibility for the successful outcome of the incident.

In most cases, a large event is managed for the first 12 hours or so (first operational period) using the incident command worksheets and Standard Operating Guidelines (SOGs) that most departments already have in place. The written IAP will be developed during this time period and put into use for the second day’s activities (second operational period).

The exception to this would be for a forecasted potential incident that may tax the standard level of operating resources such as a terrorist threat against a scheduled large public assembly or a forecasted event, such as a tornado, hurricane, or approaching wildfire.
The benefits of the planning process and the written IAP are many. The written IAP:

- Captures all of the major objectives that need to be accomplished and in the proper priority;
- Improves strategies;
- Improves incident safety;
- Improves personnel accountability;
- Improves organizational structure;
- Provides for a clear understanding of the work that needs to be accomplished, by what time, and by whom;
- Provides for proper quantities, types, and kinds of resources;
- Identifies contingencies;
- Cares for injured incident personnel and improves rehab;
- Improves incident facilities such as command post, staging, check-in, and base;
- Improves the communication plan;
- Provides proper logistical support such as food, fuel, supplies, and mechanical support;
- Improves media briefings; and
- Captures documents for future cost recovery.

The planning section for a fully expanded ICS disaster is a powerful tool that can assist the IC with every aspect of a complex incident.

The Planning Section

The planning section, if established by the IC, is responsible for collecting, evaluating, and disseminating tactical information about the incident and the status of all assigned resources. The planning section acquires this information to understand the current situation, predict the probable course of incident events, and to prepare alternative control strategies.

The planning section also is responsible for preparing required incident-related documentation (including incident
maps and the demobilization plan) and providing a primary location for technical specialists assigned to the incident.

In accordance with the National Incident Management System (NIMS), an Information and Intelligence Unit can be established in the Planning Section on an incident where there is some need for tactical intelligence and no law enforcement entity is a member of the Unified Command. Other options for managing the intelligence and information function will be discussed in Module 12.

The Incident Action Plan

Without a doubt, the most important function of the planning section is to take all incident information and develop a single action plan, the IAP.

The written IAP reduces confusion by providing a clear statement of objectives and actions. This document should be prepared for a specific span of time (referred to as an operational period).

Operational Periods

The operational periods can be of various durations (although they are usually never longer than 24 hours or shorter than 4 hours). Typically, on incidents lasting several days, the operational periods are divided into 12-hour shifts (day shift and night shift). The length of an operational period depends on the length of the time needed to achieve the tactical objectives, availability of fresh resources, the environment, and personnel safety.

For municipal or structural firefighters, the first operational period would usually be the day the incident started. The second operational period would start at 0600 the next morning when the next shift was scheduled to come on duty. The third period would start at 1800 that night and then change every 12 hours after that until the end of the incident.
The development of the written IAP must be started far enough in advance to ensure the completion of the plan, enough copies are made to hand out, and that it will be available for briefing the resources coming on duty that will be relieving the off-going resources (before their taking over the incident).

Within the ICS organization, there are a number of organizational elements (for example, section, branch, division/group, and units) that can be activated as necessary. Each of the major sections has the ability to expand internally to meet the needs of the situation.

The IC may activate and deactivate organizational elements as required. Sections do not have to be activated before branches, divisions, or units. Operational need is the primary factor in determining what is activated.

As an example, the IC may have a need to activate the resource unit to assist in the tracking of resources, but he or she does not have to establish a planning section or assign a chief.

**Planning Section Chief**

The planning section is headed by the Planning Section Chief (PSC). The PSC is one of the four general staff positions (operations, planning, logistics, and finance/administration) and is appointed by and reports directly to the IC. Each general staff position may have a deputy (or more than one), if necessary. During large events, especially where multiple agencies or jurisdictions are involved, the use of deputies from other agencies greatly increases interagency coordination.

A deputy planning section chief is usually designated when the planning section chief needs relief to rest and the deputy can run planning during the next operational period (Usually the planning chief takes the day shift and the deputy takes the night shift.), or an assisting agency (that may share
jurisdiction or have jurisdiction in the future) needs to be represented.

To reduce confusion and maintain consistency on most incidents with an expanded ICS, the command and general staff and other key positions will command the incident from start to finish and use a 12-on and 12-off schedule with day and night teams.

At the general staff or section level, the person in charge is designated as a chief (that is, the PSC).

The IC will appoint the PSC. Once appointed, the PSC will determine the need to activate or deactivate a unit. If a unit is not activated, then the responsibility for the unit’s duties will remain with the PSC.

**Planning Section Units**

The planning section consists of four primary units (and has the possibility of using a number of technical specialists).

These primary units are:

- Resource,
- Situation,
- Documentation, and
- Demobilization.

**Resource Unit**

The resource unit is responsible for maintaining the status of all resources assigned to the incident (personnel and equipment resources) by:

- Overseeing the check-in of all resources;
• Maintaining a status-keeping system (indicating current location and status of all resources); and

• Maintaining a master list of all resources (for example, key supervisory personnel and primary and support resources).

Situation Unit
This unit:

• Collects and processes information on the current incident situation,

• Prepares situation displays and situation summaries,

• Develops maps, and

• Provides projections on future situations.

To maintain accurate and timely information regarding incident situations, field observers can be assigned to the situation unit. These people are used to collect and report situation information from the field.

One of the most important functions of the planning section and the situation unit (if activated) is to look beyond the current and following operational periods and anticipate potential problems or events.

Documentation Unit
The documentation unit:

• Prepares the IAP;

• Maintains accurate, up-to-date incident files (on all incident-related documentation); and

• Provides duplication services.
Incident files always are stored for legal, analytical, and historical purposes.

Demobilization Unit

The demobilization unit is responsible for the development of the incident demobilization plan. During large, complex incidents the demobilization unit assists in ensuring that orderly, safe, and cost-effective movement of personnel will be made when their services are no longer required.

For single-agency and/or smaller incidents, the process of demobilization may be quite simple. It may not require a formal, written demobilization plan (or the establishment of a demobilization unit to prepare it).

For large incidents (especially those that may involve personnel and tactical resources from several jurisdictions), a demobilization unit within the planning section should be established early in the life of the incident. A written demobilization plan is essential for large incidents.

Technical Specialists

Technical specialists are advisors with special skills. Technical specialists report initially to the planning section, work within that section, or are reassigned wherever their services are required.

Technical specialists often are assigned to the situation unit if their experience is needed for a short time. If they are required for a longer length of time, or if several specialists are assigned to the same task, a separate unit may be established in the planning section. For example, if hazardous materials are a major ongoing factor within an incident, a Toxic Hazards Analysis Unit (comprising toxic substance specialists) may be created.

While each incident dictates its own need for technical specialists, some examples of more commonly used specialists are:
Environmental impact specialists,

Health hazardous materials specialists,

Technical rescue specialists,

Structural engineers,

Meteorologists,

Flood control specialists, and

Fire behavior specialists.

The Planning Process

Sound, timely planning is the foundation of effective incident management. The planning process is an established method of strategic planning. This method includes all steps taken by an IC (and other members of the command and general staff) to produce an IAP.

The planning process begins with the rapid planning effort of an initial response IC and can be improved, over time, by implementing formalized steps and staffing required for the development of a written IAP.

Applying the ICS to an Incident

Organizing and planning for incidents (or major disasters) using the ICS is a simple and straightforward process. In terms of applying the ICS to an incident, the system can be used when:

- Planning for a known, upcoming event or possible incident or
- Reacting to an unexpected incident.
Known, Upcoming Events or Possible Incidents

Known events are the easiest for which to prepare. Planners can establish exactly what is required before the event and in advance of any activation of the organization.

This ICS application to pre-incident planning also works well for planning nonemergency events. Some examples of the kinds of incidents or events that lend themselves to ICS application include, but are not limited to:

- A planned public event (such as a major parade or concert);
- A major training exercise or conference;
- Tornados, Hurricanes, floods, extreme weather; and
- Other incidents where advance warning would provide time for pre-incident planning.

The same ICS applications apply to planning for a major incident or disaster as to planning for a nonemergency public parade or event. In order to plan effectively, the planner must know as much as possible about the intended event or incident.

Planning stage considerations consist of:

- Type of event;
- Location, size, expected duration;
- Single or multi-agency;
- Single or multijurisdiction;
- Command staff needs (information, safety, and liaison);
- Kind, type, and number of resources required;
Staging areas required;

Other facilities required;

Kind and type of logistical support needs (for example, communications, food, medical, and finance/administration considerations);

Known limitations or restrictions; and

Available communications.

With information about each of these factors, the planning staff then can develop an appropriate organizational structure to meet the essential needs for the incident or event.

Unexpected Events or Incidents

The second type of situation (and the one that is by far the most common) is the unexpected incident. This kind of incident often is characterized by several important factors:

Extreme time pressure where many actions need to occur in a short period of time;

Require scarce and specialized resources;

Rapidly expanding incident (or has the potential to expand);

Communication overload;

Incomplete information about the incident; and

On-scene staff is experienced in control measures but inexperienced in managing expanding incidents.

This kind of situation requires immediate action(s) to organize the incident and achieve effective management and control.
First-responding units to an incident of this type must take initial steps to provide organization for the incident. This may seem obvious, but too often, it is overlooked or underrated. The number of considerations often increases as the situation deteriorates (and the incident grows).

What are the first things that need to be done? Major incidents in industrial or commercial structures or major disasters such as earthquakes, tornadoes, civil disturbances, hurricanes, and even terrorist attacks have different characteristics and require specially trained personnel to operate at the strategic, tactical, and task levels. Yet, all are quite similar in how they are approached from a management standpoint.

For any incident, the person currently in charge (the IC) must perform, at minimum, the following:

- Size up the situation;
- Determine if human life is at immediate risk;
- Establish immediate objectives;
- Determine if there are enough (and the right kind of) resources on scene and/or ordered;
- Develop an action plan;
- Establish an initial organization;
- Consider if span-of-control is at (or will soon approach) practical limits;
- Ensure that personnel safety factors are taken into account;
- Determine if there are any environmental issues that need to be considered;
• Monitor work progress; and

• Review and modify objectives and adjust the action plan as necessary.

**Transfer of Command**

Assume that you are the IC for the Incident Management Team (IMT). The initial response IC has considered all of the above and has initiated the appropriate response activity for the incident in progress.

Several important steps then need to take place in order for effective transfer of command to occur:

• The incoming IC should (if possible) personally perform an assessment of the incident situation with the initial response IC.

• The incoming IC must be briefed adequately. This briefing must be performed by the current IC and take place face to face (if possible). The briefing should cover the following information:

  * Incident history (what has happened),

  * Initial priorities and objectives,

  * Current plan,

  * Resource assignments,

  * Incident organization,

  * Resource ordering/needed,

  * Facilities established,

  * Status of communications,
The Initial Incident Action Plan

For small, uncomplicated incidents, the initial IAP may be delivered verbally. For larger, more complex, or unusual incidents, the command worksheets in the battalion vehicle are brought out and incident information is captured for use during and after the incident. At a minimum the initial IAP (command worksheet) should contain:

- Map sketch—shows the current perimeter and control lines, branch and division boundaries, and incident facilities;

- Summary of current objectives and actions—including initial control objectives, strategies and tactics, and any specific problem areas;

- Current organization—charts the names of the individuals assigned to each overhead position (modify the chart if necessary); and

- Resources summary—lists the type and kind of resources assigned, their assignment and location, what has been ordered, to which agency the resources belong, and the estimated time of arrival of those already requested.

In the ICS form catalogue, ICS Form 201 is used on initial attack wildland fires for this purpose, and in many cases is the only IAP used during the first operational period.

The ICS Form 201 is specially designed to assist the initial response IC in moving from a verbal to a written IAP (for incidents anticipated involving extended periods). Additionally, this form is an excellent tool to use during
incident briefings as it provides a written record of the incident.

One of the features of this form is that it can be disassembled easily. This allows the IC to give certain portions to the planning section for use in developing situation and resource information.

The four pages of ICS Form 201 are shown in Figures 3-2 through 3-4 on the following pages.
<table>
<thead>
<tr>
<th>INCIDENT BRIEFING</th>
<th>1. INCIDENT NAME</th>
<th>2. DATE PREPARED</th>
<th>3. TIME PREPARED</th>
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<tbody>
<tr>
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<tr>
<td>4. MAP SKETCH</td>
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</tbody>
</table>

ICS 201

PAGE 1

8. PREPARED BY (NAME AND POSITION)

Figure 3-1: ICS Form 201, page 1
7. SUMMARY OF CURRENT OBJECTIVES AND ACTIONS

CURRENT OBJECTIVES:


CURRENT ACTIONS:


Figure 3-2: ICS Form 201, page 2
6. CURRENT ORGANIZATION

INCIDENT COMMANDER

OPERATIONS

PLANNING/INTEL.

LOGISTICS

STAGING

DIV/GROUP

DIV/GROUP

DIV/GROUP

ICS 201 | PAGE 3

Figure 3-3: ICS Form 201, page 3
## 5. RESOURCES SUMMARY

<table>
<thead>
<tr>
<th>RESOURCES ORDERED</th>
<th>RESOURCE IDENTIFICATION</th>
<th>ETA</th>
<th>ON SCENE</th>
<th>LOCATION/ASSIGNMENT</th>
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<tr>
<td>ICS 201</td>
<td>PAGE 4</td>
<td></td>
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</tbody>
</table>

Figure 3-4: ICS Form 201, page 4
The Expanded, Written Incident Action Plan

Upon arriving on scene, you may find that the initial IC already may have started a written plan. This person’s decision to start a written document would be based on observed magnitude/complexity/unusual traits of the disaster and the anticipation of an extended operation in which two or more jurisdictions will be involved. The IAP produced for the second (and subsequent) operational period for these types of incidents must be formal and written. Many ICS functional groups contribute to the preparation of this document. A series of ICS forms (ICS Forms 202 through 206) can be used as the foundation of this document.

A sample, written IAP has been provided in Appendix B, Sample Incident Action Plans, of the student manual.

Methods for Transferring Command

Transition of command takes place after the briefing with the initial response IC has concluded. There are several ways that this transition can occur. The complexity of the incident and capabilities of the organization have a great deal to do with the method chosen. The following methods are the usual options:

**Method 1:** The incoming IMT is briefed by the initial IC. The incoming IMT takes over the incident immediately.

**Method 2:** The incoming team phases in with its functional counterparts for several hours and then takes over the incident at a set time.

**Method 3:** The incoming team sits in on the present team’s planning meeting (with the present team taking the lead). Both teams prepare the IAP together and phase in functionally. The incoming team then briefs and takes over the incident at the next operational period change.
Figure 3-5 on the following page (Chronological Events Leading up to Development of an IAP) provides a timeline showing the series of events that occur which result in IAP development (as well as determination of the type of IAP used).
If incident is small/simple, an IAP (Form ICS 201) is then generated/issued. (Incident concludes, IAP terminates at this point.)

Initial, responding IC arrives on scene, issues verbal IAP

If incident is large/complex/unusual, the IC may recognize the scope of the incident and begin development of a written plan.

The IMT arrives.

Transfer of Command takes place.

Written IAP is begun

Figure 3-5: Chronological Events Leading to IAP Development
Regardless of the transition method of which your organization is capable, the IMT needs to accomplish transition of command and development of its initial action plan objectives (as described in Table 3-1, Incident Management Team Objectives During Transition of Command and Development of Initial Action Plan).

Note that the expectations covered in Table 3-1 (on the following page) are accomplished while the IMT is in transition and without a written plan. The written IAP is a time- and labor-intensive document to produce and usually will be developed for the second operational period (Developed for the relief personnel coming on the next morning of the incident).
Table 3-1: Incident Management Team Objectives
During Transition of Command and Development of Initial Action Plan

<table>
<thead>
<tr>
<th>Team Member</th>
<th>Task</th>
<th>Subtask</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incident Commander</td>
<td>Hold quick IMT briefing.</td>
<td>Review/Set control objectives—From the briefing of the initial action IC, the IMT IC must evaluate/improve the initial control objectives. Determine operational periods. Evaluate/Improve strategies for the first operational period. Review/Establish immediate priorities—The IC has the responsibility to establish the order in which the objectives and strategies will be addressed. Determine expectations for the general staff. Determine needs before the planning meeting. Determine time of the first planning meeting. Review changes to the current facilities, communications, and safety plan.</td>
</tr>
<tr>
<td></td>
<td>After the initial briefing, the IC will release team members to attend to their individual responsibilities and then brief the fire chief. Provide input to command staff and general staff to ensure they meet assigned expectations. Maintain the Unit/Activity Log (ICS 214).</td>
<td></td>
</tr>
<tr>
<td>Command Staff</td>
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<tr>
<td>Safety Officer</td>
<td>Identify safety issues, evaluate/improve Safety Plan. Maintain Unit/Activity Log.</td>
<td></td>
</tr>
<tr>
<td>Information Officer</td>
<td>Determine (from the IC) limits on media releases. Prepare a media briefing. Maintain Unit/Activity Log.</td>
<td></td>
</tr>
<tr>
<td>Liaison Officer</td>
<td>Establish a list of assisting and cooperating agencies (and their representatives).</td>
<td></td>
</tr>
<tr>
<td>Team Member</td>
<td>Task</td>
<td>Subtask</td>
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<tr>
<td></td>
<td>• Brief agency representatives on incident status.</td>
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<td></td>
<td>• Maintain Unit/Activity Log.</td>
<td></td>
</tr>
<tr>
<td>Operation Section Chief</td>
<td>• Evaluate/Improve tactics—Work w/IC on new control objectives and strategies.</td>
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<tr>
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<td>• Evaluate/Improve tactics for each division and group.</td>
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<tr>
<td></td>
<td>• Evaluate/Improve division/group/branch boundaries—Evaluate/Improve control lines, division/group and branch boundaries, and assignments.</td>
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<tr>
<td></td>
<td>• Evaluate/Improve resource/support needs—After evaluation/improvement of tactics for each division/group, establish immediate and next 12-hour needs for resources, support and supplies, and place the order with the LSC.</td>
<td></td>
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<tr>
<td></td>
<td>• Evaluate/Improve incident facilities and reporting locations. The OSC, PSC, and LSC will work together to evaluate/improve and plot on a map the locations of the ICP, staging/check-in, base, camp, and drop points.</td>
<td></td>
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<td></td>
<td>• Communicate information—As needed, communicate the above information to incident personnel.</td>
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<td></td>
<td>• Maintain Unit/Activity Log (ICS 214).</td>
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</tr>
<tr>
<td>Logistics Section Chief</td>
<td>• Communications—Working with operations, evaluate/improve communications plan and establish incident communications unit.</td>
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</tr>
<tr>
<td>Team Member</td>
<td>Task</td>
<td>Subtask</td>
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</table>
| **Logistics Section Chief (cont.)** | • Medical/Rehab Plan—Evaluate/improve medical and personnel rehab plan and establish medical and Rehab units.  
• Traffic Plan—Working with operations, develop a traffic plan for incidents requiring one.  
• Initial Food Order/Plan—Obtain incident personnel total from PSC.  
• Develop food order and establish a plan.  
• Fuel Order/Mechanical—Obtain resource information from PSC and develop a fuel and mechanical repair plan.  
• Place resource and personnel order—The LSC will place the order based on the IAP.  
• Maintain the Unit/Activity Log (ICS 214). |
| **Planning Section Chief**        | • Establish check-in (with communications) at all staging areas.  
• Resource tracking—organize resource-tracking process (on paper) to include what is assigned, available, and requested.  
• Situation status (SITSTAT)—on a map document incident perimeter, division/branch boundaries, and incident facilities.  
• Chronology of events—document chronology of events (from start to current).  
• Prepare IAP—the PSC is responsible for the collection of information from the various IMT elements and assembly of information into the IAP. For the current operational period, it may be only a Form 201. For the second period, it will be a full IAP. |
<table>
<thead>
<tr>
<th>Team Member</th>
<th>Task</th>
<th>Subtask</th>
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<tbody>
<tr>
<td></td>
<td>Maintain Unit/Activity Log (ICS 214).</td>
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<tr>
<td>Finance/ Administration</td>
<td>Identify jurisdictional boundaries within the incident perimeter.</td>
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<tr>
<td>Section Chief</td>
<td>Determine existing agency agreements—determine resources for automatic or mutual aid (and financial agreement).</td>
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<td>Determine resources/rates for assistance-for-hire.</td>
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<td>Determine financial issues/constraints for department and assisting agencies.</td>
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<td>Establish procurement procedures—establish vendor list. Make contacts for anticipated procurement needs.</td>
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<tr>
<td></td>
<td>Maintain Unit/Activity Log (ICS 214).</td>
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</table>
The needs in a municipal disaster typically will move very quickly during the first few hours. This fact will put a great deal of pressure on an IMT. All expectations need to be accomplished as soon as possible to bring organization to the incident.

As mentioned above, the full IAP usually will be produced for the second operational period (after 4 to 24 hours, usually 12 hours). However, the IMT should make every effort to produce at least an ICS Form 201 (with enough copies to hand out to incident overhead personnel) during the first operational period. This information exchange is necessary for everyone to understand control objectives, current actions, current organization, and resources.

During each operational period, every resource is expected to maintain a Unit/Activity Log (ICS Form 214). The unit log is important as it documents unit actions (in the same way that documenting emergency activity is important for day-to-day emergency work).

ICS Form 214 documents individual unit actions. The paper trail assists in the development of the after-action report and justifies local budget expenditures and state and Federal financial reimbursement. This form usually will be collected during the demobilization process (so if the officer would like to retain a copy, a duplicate will need to be made). Figure 3-6, Activity/Unit Log (ICS Form 214), on the following page illustrates the contents of this log.
<table>
<thead>
<tr>
<th>UNIT LOG</th>
<th>1. INCIDENT NAME</th>
<th>2. DATE PREPARED</th>
<th>3. TIME PREPARED</th>
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<tbody>
<tr>
<td>4. UNIT NAME/DESIGNATORS</td>
<td>5. UNIT LEADER (NAME AND POSITION)</td>
<td>6. OPERATIONAL PERIOD</td>
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</table>

7. PERSONNEL ROSTER ASSIGNED

<table>
<thead>
<tr>
<th>NAME</th>
<th>ICS POSITION</th>
<th>HOME BASE</th>
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8. ACTIVITY LOG (CONTINUE ON REVERSE)

<table>
<thead>
<tr>
<th>TIME</th>
<th>MAJOR EVENTS</th>
</tr>
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<tbody>
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Figure 3-6: Activity/Unit Log (ICS 214)
The Incident Action Plan Cycle

Critical factors of incident operations often are overlooked or not given enough emphasis. This problem can result in poor use of resources, inappropriate strategies and tactics, safety problems, high incident costs, and lower effectiveness.

A simple (but thorough) process for planning can be used for both small, short-term incidents and longer, more complex ones. This process is referred to as the IAP cycle and consists of eight sequential steps (illustrated in Figure 3-7).

**Figure 3-7: The Incident Action Plan Cycle**
The first of these three steps can be done by the IC or at a formal planning meeting. The last steps ensure that the plan does its intended job. These eight steps are:

1. Understanding the situation;
2. Establishing incident control objectives;
3. Developing control operations (work assignments);
4. Conducting a planning meeting;
5. Preparing the plan;
6. Conducting an operations briefing;
7. Implementing the plan;
8. Evaluating the plan; and

1. **Understanding the situation**

   In general, the essential information needed to understand the situation fully consists of:

   - What has occurred,
   - Progress made,
   - Effectiveness (of the current plan),
   - If the incident will get bigger (or smaller), and
   - Present (and future) resource and organizational needs.

   **2. Establishing Incident Control Objectives**

   For the purposes of developing a written IAP the IC must identify what control objectives need to be accomplished to bring the incident to a close.
Incident control objectives are statements of guidance and direction necessary for the selection of appropriate work assignments for the resources assigned to the incident.

Essentially, incident control objectives are conceived using the incident priorities of life safety, incident stabilization, environmental protection, and property conservation and strategic considerations based on Lloyd Layman’s seven strategies (RECEO VS).

Control objectives answer the question, “What can be accomplished when all allocated resources have been deployed effectively (based on realistic expectations)?” These objectives must be achievable and measurable yet flexible enough to allow operations resources latitude on how they will be accomplished. For some types of incidents, the time allowed to achieve the objective is critical. For others, time, while always important, may not be an overriding issue.

Determining incident control objectives is an essential prerequisite to developing a plan. Incident control objectives must be attainable with the resources available to the agency (even though it may take several operational periods to accomplish). Control objectives must be measurable so that a final accounting can determine whether objectives were achieved.

The following are some single examples of incident control objectives for several different types of incidents. Each of these objectives is measurable; some are time dependent:

- Mitigate, stabilize, or isolate all hazards that could cause serious personal injury within the limits of Central City;
- Prevent conflagration by containing all fires to the building of origin;
- Evacuate all residents from the projected flood area by 1400 hours; and
• Search all damaged structures, within Central City, for casualties by 1600 hours.

3. Developing Control Operations (Work Assignments)

Contained in the IAP are directions to all incident resources on what needs to be done and in some cases how it will be done to accomplish the incident control objectives identified by the IC.

Control operations are the work assignments that should be accomplished by all operational resources working on the incident during that operational period only.

These control operations (work assignments) may be written as strategies that direct resources on what needs to be done and give the resources on the incident the latitude on what tactics will be used to complete the control objectives. The alternative would be to write the assignments as tactics that direct the resources on how the objective will be accomplished.

The operations section chief, after collaborating with the IC on the incident control objectives, will develop control operations to achieve the objective.

For example, for one of the incident control objectives listed above (‘Mitigate, stabilize, or isolate all hazards that could cause serious personal injury within the limits of Central City’) the following control operations could be employed:

1. Haz mat units shall monitor all damaged properties within their assigned areas for flammable or hazardous material leaks and take corrective actions.

2. US&R units are to shore unsafe structures before entry of the public or incident personnel.

3. First responders shall use fire line tape to isolate all damaged properties that could cause further serious injury.
Any one of these control operations would contribute to meeting the incident control objective; all three could be used together.

For large incidents that may last for some time, there is a limit to what may be achieved (in terms of accomplishing an incident control objective in a single operational period). Therefore, control operations should be stated in terms of accomplishments that can be achieved realistically within the time frame of an operational period.

Resource assignments will be made for each of the specific work tasks. These assignments will consist of the kind and number of resource needed to achieve the assignment for each operational period.

If resources are not available for a specific work assignment, then the IC may need to prioritize or reassess the assignment (and perhaps the overall control objective).

4. Conducting a Planning Meeting

Upon completing initial expectations (covered in Table 3-1, IMT Objectives), the IMT is well on its way to assembling information needed for the first planning meeting. The purpose of the planning meeting is to capture information for the development of the IAP for the next operational period.

Planning meetings usually are held twice each day (at 0900 and 2100). The evening meeting is intended to start the development of an IAP for activities belonging to the next operational period.

Every decision at the planning meeting is driven by the requests of the operations section. Therefore, it is extremely important that operations arrives at the planning meeting knowing what its organizational needs will be for the next operational period.
The PSC is responsible for conducting the planning meetings. The planning process outlined below will, if followed, provide a logical set of steps for the chief to follow. (Note: this process works only if everyone involved comes to the planning meeting well prepared and understands the process.)

It is important that (before the planning meeting) interagency negotiations on the use of resources, strategies, and costs have been discussed and resolved by the IC or unified command.

Planning meetings often have been criticized for taking too long. The PSC’s responsibility is to take and keep control of the meeting. It is necessary that this person show strong leadership by insisting that all participants arrive prepared, that they stick to the planning process, and that no radios or cellular telephones are allowed in the meeting.

The Planning Meeting Checklist, Table 3-2, was developed to indicate the steps required in the planning meeting (and the person or people responsible for the step). Using this checklist ensures that all information needed to prepare the IAP has been captured.
**Table 3-2:**
**Planning Meeting Checklist**

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Responsible Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Briefing (situation and resource status).</td>
<td>PSC</td>
</tr>
<tr>
<td>2. Set control objectives.</td>
<td>IC</td>
</tr>
<tr>
<td>3. Plot control lines, establish division boundaries, identify group assignments.</td>
<td>OSC</td>
</tr>
<tr>
<td>4. Specify tactics for each division.</td>
<td>OSC</td>
</tr>
<tr>
<td>5. Specify resources needed by division/group.</td>
<td>OSC, PSC</td>
</tr>
<tr>
<td>6. Specify operations facilities and reporting locations—plot on map.</td>
<td>OSC, PSC, LSC</td>
</tr>
<tr>
<td>7. Place resource and personnel order.</td>
<td>LSC</td>
</tr>
<tr>
<td>8. Consider communications, medical and traffic plan requirements.</td>
<td>PSC, LSC</td>
</tr>
<tr>
<td>9. Finalize, approve, and implement IAP.</td>
<td>PSC, IC, OSC</td>
</tr>
</tbody>
</table>

IC = Incident Commander  
OSC = Operations Section Chief  
PSC = Planning Section Chief  
LSC = Logistics Section Chief

The Operational Planning Worksheet (ICS Form 215, shown in Figure 3-8) was developed to support the planning process. The form is intended to be used during the planning meeting to develop tactical assignments and resources needed to achieve incident objectives and strategies.

The OSC is responsible for the information that is contained on the form and should come to the planning meeting with the form roughed out.

It is quite common for the OSC to prepare the form and turn it into planning before the planning meeting. The planning staff then can copy the information onto an enlargement of the form that allows everyone at the meeting to see and comment on the information.
Once it has been reviewed and corrections or additions have been made to the information, planning will use it to prepare the resource requests and other portions of the IAP.
Figure 3-8: Operational Planning Worksheet (ICS Form 215)
5. Preparing the Plan

At the conclusion of a properly managed planning meeting, the IMT staff should have all information required to develop the IAP. Various sections of the IMT will adjourn to complete their portion of the plan.

The documentation unit (within the planning section) is responsible for preparing and duplicating the IAP.

Incident Action Plan Elements

Seven elements are essential to any effective, written IAP. As shown in Figure 3-9, IAP Toolbox, these elements are:

- ICS Form 202,
- ICS Form 203,
- ICS Form 204,
- ICS Form 205,
- ICS Form 206,
- An incident map, and
- A traffic plan.

As your experience increases, you will find that some agencies have modified these forms to suit their particular application areas.
This collection of forms, an incident map, and traffic plan are used as the basis of the written IAP. Each form provides an important facet of information necessary to manage an incident of large magnitude effectively. An explanation of the forms (and their contents) is presented below.

**Incident Objectives** (ICS Form 202). This form (shown as Figure 3-10) lists general control objectives (incident objectives—refer to the definition and examples of incident objectives).

**Organization Assignment List** (ICS Form 203). This form (Figure 3-11) describes elements of the ICS organization that will be in place for the next operational period.

**Assignment List** (ICS Form 204). This form (Figure 3-12) is used by the division/group supervisors and identifies strategy(ies) and tactic(s) (refer back to the definition and examples for strategy and tactics) that will be completed during the operational period to achieve the incident objectives. It also lists resources that will be assigned to the division/group to complete the expectations.
Incident Radio Communications Plan (ICS Form 205). This form (Figure 3-13) lists the radio channels or frequencies that will be used for each element of the incident organization. (This is a very useful form during complex incidents involving multiple jurisdictions, multiple agencies, and unified command.)

Medical Plan (ICS Form 206). This form (Figure 3-14) describes who to contact (at the incident) and which medical facility to use in the event of firefighter injury. (This form is intended for use in the care of injured incident personnel).

Incident map. This map is not a form, so it has no number. Maps are very useful for documenting and communicating location(s) of branch and division boundaries, incident facilities, and other incident information.

Traffic Plan. This map is not a form, so it has no number. This map indicates road closures, bridge closures, potential road hazards, drop points, incident facilities, and best roads to travel around the incident. (Additionally, you may want a traffic plan to indicate travel in and around base/camp.)

All sections send their forms to the planning section, which assembles them into one document.

The documentation unit (within the planning section) has the responsibility for preparation and duplication of the IAP.

All sections MUST have their forms and information to planning no later than 2400 hours (1200 for day shift). Planning will not be able to get the IAP written, assembled, approved, and printed if information is received after this time.

Between 0200 and 0400 (1400 and 1600 for day shift), the IC should have reviewed and approved the plan. The planning section then has enough printed copies for distribution at the morning operations briefing.
Enough copies of the IAP should be made so that copies can be provided down to at least the division/group level.

Everything that the oncoming shift will need to know in order to “hit the ground running” should be in place and documented in the IAP.

The oncoming shift will review the new IAP with the off-going shift at a shift change meeting called the operations briefing.
### INCIDENT OBJECTIVES

<table>
<thead>
<tr>
<th>1. INCIDENT NAME</th>
<th>2. DATE PREPARED</th>
<th>3. TIME PREPARED</th>
</tr>
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<tbody>
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<table>
<thead>
<tr>
<th>4. OPERATIONAL PERIOD (DATE/TIME)</th>
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<table>
<thead>
<tr>
<th>5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)</th>
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<table>
<thead>
<tr>
<th>6. WEATHER FORECAST FOR OPERATIONAL PERIOD</th>
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<th>7. GENERAL SAFETY MESSAGE</th>
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<table>
<thead>
<tr>
<th>8. ATTACHMENTS (CHECK IF ATTACHED)</th>
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</thead>
<tbody>
<tr>
<td>ORGANIZATION LIST (ICS 203)</td>
</tr>
<tr>
<td>ASSIGNMENT LIST (ICS 204)</td>
</tr>
<tr>
<td>COMMUNICATIONS PLAN (ICS 205)</td>
</tr>
<tr>
<td>MEDICAL PLAN (ICS 206)</td>
</tr>
<tr>
<td>INCIDENT MAP</td>
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<tr>
<td>TRAFFIC PLAN</td>
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<thead>
<tr>
<th>ICS 202</th>
<th>9. PREPARED BY (PLANNING SECTION CHIEF)</th>
<th>10. APPROVED BY (INCIDENT COMMANDER)</th>
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<tbody>
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**Figure 3-10: Incident Objectives (ICS Form 202)**
## ORGANIZATION ASSIGNMENT LIST

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<th>3 TIME PREPARED</th>
<th>4. OPERATIONAL PERIOD (DATE/TIME)</th>
<th>5. INCIDENT COMMANDER AND STAFF</th>
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<td>SAFETY OFFICER</td>
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<td>INFORMATION OFFICER</td>
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<td>LIAISON OFFICER</td>
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<td>D. AIR OPERATIONS BRANCH DIRECTOR</td>
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**Figure 3-11: Organization Assignment List (ICS Form 203)**
<table>
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<tr>
<th>1. BRANCH</th>
<th>2. DIVISION/GROUP</th>
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**ASSIGNMENT LIST**

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<tr>
<th>3. INCIDENT NAME</th>
<th>4. OPERATIONAL PERIOD</th>
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<tbody>
<tr>
<td></td>
<td>DATE: ________________</td>
</tr>
<tr>
<td></td>
<td>TIME: ________________</td>
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<table>
<thead>
<tr>
<th>5. OPERATIONS PERSONNEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPERATIONS CHIEF</td>
</tr>
<tr>
<td>_________________________</td>
</tr>
<tr>
<td>DIVISION/GROUP SUPERVISOR</td>
</tr>
<tr>
<td>__________________________</td>
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<tr>
<td>BRANCH DIRECTOR</td>
</tr>
<tr>
<td>_________________________</td>
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<tr>
<td>AIR TACTICAL GROUP SUPERVISOR</td>
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<td>__________________________</td>
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<table>
<thead>
<tr>
<th>6. RESOURCES ASSIGNED THIS PERIOD</th>
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<tbody>
<tr>
<td>STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR</td>
</tr>
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<thead>
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<th>7. CONTROL OPERATIONS</th>
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<table>
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<th>8. SPECIAL INSTRUCTIONS</th>
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<table>
<thead>
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**Figure 3-12: Assignment List (ICS Form 204)**
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**INCIDENT RADIO COMMUNICATIONS PLAN**

**Figure 3-13: Incident Radio Communications Plan (ICS Form 205)**
## Medical Plan (ICS Form 206)

<table>
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<th>1. Incident Name</th>
<th>2. Date Prepared</th>
<th>3. Time Prepared</th>
<th>4. Operational Period</th>
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### 5. Incident Medical Aid Stations

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<th>Location</th>
<th>Paramedics</th>
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### 6. Transportation

#### A. Ambulance Services

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#### B. Incident Ambulances

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### 7. Hospitals

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<th>Burn Center</th>
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### 8. Medical Emergency Procedures

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<th>10. Reviewed By (Safety Officer)</th>
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Figure 3-14: Medical Plan (ICS Form 206)
6. Conducting an Operations Briefing

On large incidents (or major disasters that require more than one operational period), the written IAP (covering the new period) is reviewed at the operational briefing with the oncoming shift.

It is typical for multiple-day, large incidents/disasters to be divided into 12-hour operational periods (referred to as day and night shifts).

This is done to allow half of the overhead and line personnel to rest. An IC cannot expect staff to work a shift longer than 12 hours and not make serious mental errors or be involved in safety violations.

This is an important fact to remember when calculating staffing requirements for multiple-period incidents. It dictates the necessity of dividing your resources by two.

The shift begins at 0500 and 1700 (depending on whether it is the start of the day or night shift) with the operations briefing. The intent of this briefing is to review the new IAP that covers the next 12-hour period.

Who attends each operational briefing is dictated by the shift with which the person is involved.

Persons who should attend the operations briefing for the off-going shift are:

- IC (only one per incident),
- General staff,
- Command staff,
- Key technical specialists,
- Communications unit leader,
• Situation unit leader, and

• Other positions (as requested by the IC).

(Remember that there is an incident occurring. Therefore, many of the off-going shift overhead positions will brief their relief while on the line).

Persons who should attend the operations briefing for the oncoming shift are:

• IC (still the same person),

• General staff,

• Command staff,

• Branch, division, group, and unit overhead personnel,

• Technical specialists, and

• Agency representatives.

These meetings can get quite large. They usually do not include personnel who do not have a specific need to be present. Personnel such as assistant unit leaders, single resource personnel, and the like will be briefed on the line by oncoming shift overhead.

Operations Briefing Agenda

The agenda for the operations briefing outlines 16 basic items to be reviewed. A list covering each item (and identification of who is responsible for obtaining/delivering the information) is presented in Table 3-3.

At the conclusion of the operations briefing, the oncoming shift takes over and continues to manage the incident. During each shift, the IAP is prepared for the next operational period (to hand off to the next shift). This cycle continues until the incident is completed.
Table 3-3:
Operations Briefing (0500 and 1700 Hours) Agenda Items

<table>
<thead>
<tr>
<th>Agenda Item</th>
<th>Person Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction and welcome.</td>
<td>PSC, IC</td>
</tr>
<tr>
<td>2. Review of incident objective, ICS 202.</td>
<td>IC(s)</td>
</tr>
<tr>
<td>3. Review of incident activities during past operational period.</td>
<td>Off-going OSC</td>
</tr>
<tr>
<td>4. Review of current and predicted weather.</td>
<td>Situation unit leader</td>
</tr>
<tr>
<td>5. Review of incident boundaries, division breaks, group locations, drop points, etc.</td>
<td>OSC</td>
</tr>
<tr>
<td>6. Review of all Division Assignment Lists, ICS 204. This review is to consist of the following items: Physical identification of branch directors and division/group supervisors. Identification of division briefing sites. Review of control operations. Review of special instructions. Review of division communications procedures.</td>
<td>OSC</td>
</tr>
<tr>
<td>9. Review of Medical Plan, ICS 206.</td>
<td>Medical unit leader</td>
</tr>
<tr>
<td>10. Review of Air Operations Summary, ICS 220.</td>
<td>Air operations branch director</td>
</tr>
<tr>
<td>11. Review of incident logistics issues.</td>
<td>LSC</td>
</tr>
<tr>
<td>12. Review of incident finance/administration issues.</td>
<td>Finance/administration section chief</td>
</tr>
<tr>
<td>13. Review of agency representative’s issues.</td>
<td>Liaison officer</td>
</tr>
<tr>
<td>14. Review of media and incident information issues.</td>
<td>Information officer</td>
</tr>
<tr>
<td>15. Review by technical specialists.</td>
<td>(Varies depending on incident.)</td>
</tr>
<tr>
<td>16. Conclusion and direction of operations personnel to their respective briefing sites.</td>
<td>PSC, IC</td>
</tr>
</tbody>
</table>
7. Implementing the Incident Action Plan

On small incidents with no written plan, the IC has full responsibility for the implementation of the verbal plan.

Large incidents will require a written plan. General staff members are responsible for implementing their respective portion of the plan.

Following the operations briefing, the oncoming shift division/group supervisors and other overhead resources move to their assignments where they receive briefings and relieve the off-going supervisors.

The oncoming supervisor briefs the resources assigned to his or her area using the IAP and then puts the resources to work.

Once at work, the IAP usually is not looked at very frequently except for reference purposes.

8. Evaluating the Plan

During the operational period, the IC and the planning and operations chiefs should assess work progress against plan objectives. If they find deficiencies, they may need to:

- Improve directions,
- Provide additional resources,
- Modify tactical operations, or
- Make changes to the next operational period.

If necessary, the OSC may make changes to tactical operations (called for in the IAP) to accomplish an objective.
Planning for Incident Demobilization

Incident demobilization is a very important part of the planning process. For small, day-to-day incidents, demobilization planning is relatively simple and does not require a written plan. However, for larger incidents (particularly those with multiagency involvement) it is essential to have a written demobilization plan.

The PSC must establish an adequate demobilization unit to provide for the orderly and efficient release of incident resources.

Release priorities must be determined by looking at all elements of the organization.

Pre-Incident Action Plans

Many major incidents or disasters can be forecasted or anticipated. Many of them can be predicted to the day, sometimes to the hour. Some of these disasters might include floods, tornadoes, extreme weather, civil unrest, hurricanes, terrorism, and volcanoes. The scientific community is even making great strides in its knowledge and understanding of earthquakes.

Before the Incident

If the event was planned or anticipated, the IMT should have a pre-incident IAP completed before the incident takes place.

Following a briefing from the initial action IC, the IMT can add missing information to the pre-incident IAP (for example, location of incident, location of facilities, overhead personnel changes, branch, and division/group information). Once this additional information is added, the planning section can make copies and distribute the IAP during the operational period.
Some organizations have pre-incident IAPs for every type of major incident or disaster that may strike their community. These documents sometimes are loaded into a computer-based IAP program (that greatly reduces staff time needed to produce a quality IAP).

Upon reviewing the ICS Forms 202 through 206, you should be able to identify quite a bit of information that can be filled in before a disaster.

So, don’t wait to react to the next disaster; get your team together and develop a plan before its arrival.
Activity 3.1:
Pre-Incident Action Planning
Student Activity Worksheet

Time: 60 minutes

Purpose:
To help students understand the importance of preplanning (objectives) in anticipation of a disaster. Each type of disaster will direct you to specific objectives. These objectives form the basis of guidelines for operational and command personnel.

Directions:
1. The instructor will assign you to a small group.
2. Your group will work on one of the following worksheets associated with a disaster:
   - Worksheet #1: Hurricane
   - Worksheet #2: Tornado
   - Worksheet #3: Earthquake
   - Worksheet #4: Terrorist incident
3. Your group will complete the following tasks:
   - Elect a group recorder and spokesperson.
   - Read the Pre-Activity Information sheet.
4. Using the worksheet to organize your thoughts, develop the following Central City Fire Department items on an easel pad:
   - A list that contains a minimum of five incident control objectives and
   - A list that contains a minimum of five unit-level control assignments.
5. Your group will have 30 minutes to complete these tasks and record your final responses on an easel pad.
6. After the allotted time, the instructor will call upon your group’s spokesperson to report your group’s findings.

Notes:
Pre-Activity Information Sheet

Preplanning specific objectives in anticipation of a disaster can be critical to successful recognition and completion of those objectives when the event occurs. Although not all conditions encountered during a disaster response will have been predicted, knowing what to do about those that will make a difference. Different disasters will cause similar objectives to be identified, but also will create objectives unique to that type of event.

Unit or station battalion/district/division offices will require some form of guidelines to follow in the event that communications are down and they must begin service without directions from command. It would be unfair to lay down hard and fast rules to be followed by experienced emergency service workers after a catastrophic disaster has occurred. These people will have to make decisions based upon their knowledge, experience, and the situation. They should, however, understand the strategy(ies) associated with the various disasters that may strike Central City.
Worksheet #1: Hurricane

Incident Objectives

Responses:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Unit-Level Assignments

Responses:

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Worksheet #2: Tornado

Incident Objectives

Responses:

________________________________________________________________________

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Unit-Level Assignments

Responses:

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________________________________________________________________________
Worksheet #3: Earthquake

Incident Objectives

Responses:

__________________________________________________________________________

__________________________________________________________________________

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__________________________________________________________________________

Unit-Level Assignments

Responses:

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__________________________________________________________________________
Worksheet #4: Terrorist Incident

Incident Objectives

Responses:

________________________________________________________________________

________________________________________________________________________

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________________________________________________________________________

Unit-Level Assignments

Responses:

________________________________________________________________________

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________________________________________________________________________
Activity 3.2:
Incident Action Planning
Student Activity Worksheet

Time: 165 minutes
   60 minutes—directions and group work
   45 minutes—planning meeting
   60 minutes—class discussion

Purpose:
To demonstrate the ability to plan response capabilities in a manner that maximizes efforts in providing emergency services.

Directions:
1. Your instructor will divide the class into five ICS functional groups:
   - Incident command group
   - Command staff group
   - Operations group
   - Planning group
   - Logistics group

2. You group will be assigned a break-out area. Your group will work as a team, performing this activity from the perspective of your assigned ICS element.

3. Your instructor will review the roles/tasks that each group will assume during this activity (shown on the Incident Management Team Objectives Chart).

This activity is driven by a fire chief’s briefing and maps of forecasted flood conditions. The activity begins with all groups gathering to receive an initial briefing from the Central City Fire Chief (the instructor). The briefing centers on current and projected conditions for a Central City flood.
4. After your instructor has briefed the class, he or she will activate the IMT. The team’s focus is to assimilate information for an IAP. (Note: The actual IAP will be assembled/completed after the planning meeting associated with this activity.)

5. You will relocate to your assigned break-out area.

While in your breakout area, your group will have 45 minutes to:

- Elect a group spokesperson;
- Review the flood information;
- Discuss current and forecasted flood conditions;
- Develop responses to the tasks listed for your assigned ICS element on the Incident Management Team Objectives sheet; and
- Complete your portion of the IAP form(s).

6. After the incident command group reviews the flood information and composes its responses, group members will circulate among the other groups in breakout areas. Their job is to ensure that other groups list all tasks necessary to respond to the current emergency.

Groups will need to interact (for example, operations with IC, plans with logistics, and logistics with operations). Interaction is the only way for you to obtain the information to complete your task lists and the necessary forms for the planning meeting.

7. At the conclusion of the allotted time, your instructor will reconvene the class and hold the planning meeting using the Planning Meeting Checklist.

The focus of the planning meeting will be to collect and exchange all information necessary to prepare an IAP for a Central City flood.

The planning chief (planning group spokesperson) will lead the planning meeting.

Each group will report its findings to the chief and turn over its ICS form(s).
The planning chief will be assisted by the instructor and other planning group members, who will begin assembling the plan as each group turns in its completed form(s).

The planning chief will use the Planning Meeting Checklist to structure the meeting.

By the end of the meeting, the planning section should have all necessary information and should complete/assemble the IAP.

Once the planning group has completed the IAP and the instructor has checked its work, copies will be made and distributed to students. At that point, an operations briefing will be held using the Operations Briefing Agenda in Table 3-3. The operations briefing will be conducted as though the IMT were briefing the responders before starting the operational period.

Notes:
Fire Chief's Briefing

April 1, 1000 hours

Liberty County and Central City have experienced steady, moderate-to-heavy rain for the past 6 days.

During this time, water runoff into the Roaring River, especially from tributaries such as Towalomie River and Swatera Creek, has caused the Roaring River in the Central City area to rise to within one foot of flood stage.

Some minor flooding already has occurred within low-lying areas of Central City.

Torrential rains are reported at this time in the mountain areas north of Central City. The Liberty County Weather Bureau is reporting the possibility of 4 to 5 inches of rain in the mountain areas within the next 24 hours.

Liberty County Department of Engineering, Flood Control Division, is estimating that if mountain rainfall amounts reported at this time are accurate, flood stages of the Roaring River in the Central City area will be reached in approximately 2 hours, serious major flooding could occur within 6 hours.

The Flood Control Division currently is working on a prediction based on potential 24-hour rainfall amounts and has agreed to provide updates on projected flood conditions to the fire department on a periodic basis.

The Flood Control Division also has compiled projected inundation maps of Central City based on flood conditions caused by Tropical Storm Edward in 1985.

The attached maps estimate the area(s) of the city that will be flooded by 1400 and 1800 hours.

The National Weather Service (NWS) has announced that the heavy rain will continue in the southern part of the State of Columbia for several more days.

Portions of Stramford, Apple, Granite, Mineral, Kane, and Green counties are expected to suffer flood damage.
The statewide master mutual aid system has been activated; however, Central City cannot anticipate any outside help or resources for the next 12 hours.

Public works has notified all city departments that they should plan for all bridges across the Roaring River, within Central City, to be impassible by 1430 hours. The closest possible crossing point will be U.S. Highway 102, four miles south of the city limits.

Public health has warned that all flood waters should be considered contaminated because of the wide area flooding and runoff from farm lands, manufacturing, and waste treatment facilities to mention just a few.

My directions to this Incident Management Team are as follows:

- Safety of our people and the public is your first priority.
- Our primary missions are rescue, fire suppression, environmental protection, and property conservation.
- The department has four radio frequencies. Dispatch is on Channel one. Channels two, three, and four can be used for the incident.
- I have put all fire department shift personnel on a 24-hour-on and 24-hour-off status until further notice. All personnel will be on telephone stand-by when off duty.
- It is 1000 hours now. I want a planning meeting started by 1100 hours and the IAP ready for distribution at the operational briefing at 1200 hours.
- This Incident Management Team shall be in place and take over the incident by 1300 hrs.
- The first operational period will be from 1300 hours to 0600 hours and then on a 12-hour cycle after that (0600 to 1800 hours). Shift personnel will be on a 24-hour cycle.
- This incident will surely become a statewide disaster and possibly a Federal disaster, so all costs may be recoverable. It is very important that everyone on the incident track his or her time on the ICS Form 214 and that logistics will let no one demobilize without getting Form 214 from the unit or personnel.

This is one of the worst days in our city’s history. Let’s all work to make this our department’s finest hour.
1400 Hours: Projected Inundation Area(s)
1800 Hours: Projected Inundation Area(s)
Central City Fire and Emergency Medical Services

Fire Resources

Overhead Positions—one Fire Chief, one Assistant Chief, one Chief Fire Marshal, seven Fire Inspectors, one Training Captain, two Training Lts., three Deputy Chiefs (1 per shift), six Battalion Chiefs (2 Battalions x 3 shifts).

Eleven engine companies—Engines 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11. Each engine company is staffed with one officer and three firefighters.

Four truck companies—Trucks 1, 3, 5, and 8. Each truck company is staffed with one officer and three firefighters.

Squad Company 1. The squad company is staffed with one officer and two firefighters fully trained in rescue practices.

Crash/Fire/Rescue Engine. Airport-staffed with one officer and two firefighters.


Truck 103. Reserve Truck—fully equipped.

Engine 104 (1,500-gpm foam pumper). Apparatus contains one 500-gallon foam tank; 400 five-gallon cans of foam are stored at Engine 4.

All members of Engine 5 and Truck 5 have been fully trained as a Hazardous Materials Response Team.

Mask Service Unit 106.

Engine 206 (light truck).

Boat 2 - 16’ Boston Whaler.

EMS Resources (third service operated by the city and stationed in the fire stations):

Three EMS supervisors – (one per shift x 3 shifts) operating out of fire station 1.

Five ALS ambulances – ALS 2, 4, 7, 9, and 11

Five BLS ambulances – BLS 3, 5, 6, 8, and 10
# Central City Fire/EMS Response Criteria

## 1st-Alarm Resource Card
- Engine 1: Truck 1
- Engine 2: Ambulance 2
- Engine 3: Squad 1
- Response time: 5 min.
- Battalion 1
- MSU 6

## 2nd-Alarm Resource Card
- Engine 4: Truck 3
- Engine 5: Ambulance 3
- Engine 6: EMS Supervisor
- Response time: 10 min.
- Battalion 2
- Deputy Chief

## 3rd-Alarm Resource Card
- Engine 7: Truck 5
- Engine 8: Trng. Battalion Chief
- Engine 9: Adm. Battalion Chief
- Response time: 15 min.
- Fire Marshal (Bn. Chief)

## 4th-Alarm Resource Card
- Engine 10: Truck 8
- Engine 11
- Response time: 15 min.

## 5th-Alarm Resource Card
- Fisherville Engine 1
- Harvest Junct. Engine 2
- Kingston Engine 1
- Response time: 20 min.

## 6th-Alarm Resource Card
- Apple Valley Engine 1
- Bayport Engine 2
- Jasper Engine 2
- Response time: 20 min.

## 7th-Alarm Response Card
- Deep Water Engine 2
- Kingston Engine 3
- Response time: 25 min.
## Incident Management Team Objectives Chart

<table>
<thead>
<tr>
<th>Incident Management Team Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Incident Commander</strong></td>
</tr>
<tr>
<td>1. Holds briefing before the first planning meeting (for this activity, the Fire Chief’s Briefing will satisfy this requirement).</td>
</tr>
<tr>
<td>2. Obtains an overview of current and predicted flood conditions or changes.</td>
</tr>
<tr>
<td>3. Sets control objectives.</td>
</tr>
<tr>
<td>4. Determines operational periods.</td>
</tr>
<tr>
<td>5. Evaluates strategies for the next 12 hours.</td>
</tr>
<tr>
<td>6. Establishes immediate priorities. (The IC has the responsibility to establish the order in which the objectives and strategies will be addressed.)</td>
</tr>
<tr>
<td>7. Establishes an appropriate organization.</td>
</tr>
<tr>
<td>8. Identifies and establishes an ICP.</td>
</tr>
<tr>
<td>9. Generates expectations for general staff.</td>
</tr>
<tr>
<td>10. Develops list of needs before the planning meeting.</td>
</tr>
<tr>
<td>11. Determines time of first planning meeting.</td>
</tr>
<tr>
<td>13. Determines when the IMT officially will take command.</td>
</tr>
<tr>
<td>14. After the initial briefing, releases the IMT (to attend to its individual responsibilities prior to the Planning meeting).</td>
</tr>
<tr>
<td>15. The IC now provides input to his or her command staff and the general staff to ensure that they meet assigned expectations.</td>
</tr>
<tr>
<td>16. Maintains Unit/Activity Log (ICS 214).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety Officer:</strong></td>
</tr>
<tr>
<td>1. Identifies safety issues and develops safety plan.</td>
</tr>
<tr>
<td>2. Exercises emergency authority to stop and prevent unsafe acts.</td>
</tr>
<tr>
<td>3. Investigates accidents that have occurred within the incident area (involving incident personnel).</td>
</tr>
</tbody>
</table>

| Information Officer:             |
| 1. Determines (from the IC) if there are any limits on media releases; prepares media briefing. |
| 2. Develops material for use in media briefing. |
3. Obtains IC approval of media release(s).
4. Conducts media briefings.
5. Arranges for tours, interviews, or briefings that may be required.
6. Obtains media information that may be useful to incident planning.

Liaison Officer:
1. Establishes list of assisting and cooperating agencies (and their representatives).
2. Briefs assisting/cooperating agencies on incident status.

All three command staff positions maintain a Unit/Activity Log (ICS 214).

<table>
<thead>
<tr>
<th>Operations Section Chief</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Works with IC to set control objectives and strategies.</td>
</tr>
<tr>
<td>2. Develops tactics for each division and group.</td>
</tr>
<tr>
<td>3. Develops division/group/branch boundaries.</td>
</tr>
<tr>
<td>4. Identifies resource/support needs (after development of tactics for each division/group, establishes immediate and 12-hour needs for resources, support, and supplies. Places order with LSC).</td>
</tr>
<tr>
<td>5. Identifies incident facilities and reports locations (the OSC, PSC, and LSC work together to evaluate/improve and plot (on a map) locations of the ICP, staging/check-in, base, camp, and drop points).</td>
</tr>
<tr>
<td>6. Communicates information (on an as-needed basis, communicates above information to incident personnel).</td>
</tr>
<tr>
<td>7. Maintains a Unit/Activity Log (ICS 214).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Planning Section Chief</th>
<th>1. Establishes check-in (ensures that check-in recorders have communication with the planning section).</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Handles resource tracking (organizes resource tracking process to include what has been assigned, is available, and what has been requested).</td>
<td></td>
</tr>
<tr>
<td>3. Tracks situation status (on a map, documents incident perimeter, division/branch boundaries, and incident facilities).</td>
<td></td>
</tr>
<tr>
<td>4. Determines need for technical specialist(s) required to support the incident.</td>
<td></td>
</tr>
<tr>
<td>5. Establishes special information collection activities as necessary (for example, weather, toxins, and environmental</td>
<td></td>
</tr>
</tbody>
</table>


| SM 3-82 |
| **Finance/Administration Chief** | 1. Identifies jurisdictional boundaries (identifies boundaries of all jurisdictions within incident perimeter).  
2. Determines existing agency agreements (determines resources that are on the incident as a result of automatic or mutual aid (and their financial agreement)). Also determines resources available by assistance-by-hire (and their rates).  
3. Determines financial issues (financial issues/constraints for both the department and existing agencies).  
4. Establishes procurement procedures (establishes vendor list and makes contacts for anticipated procurement needs).  
5. Maintains daily contact with department on finance/administration matters.  
6. Ensures that all personnel time records are completed accurately.  
7. Ensures that all obligation documents and future claim documentation are completed.  
8. Maintains Unit/Activity Log (ICS 214). |
| **Logistics Section Chief** | 1. Works with operations, evaluates/improves communications plan and establishes incident.  
2. Evaluates and improves medical and personnel rehabilitation plan. Establishes medical and rehabilitation units.  
3. Works with operations to develop a traffic plan (for incidents where one is required).  
4. Obtains incident personnel total from PSC (for initial food order/plan).  
5. Develops food order and establishes plan.  
6. Obtains resource information from PSC and develops fuel and mechanical repair plan.  
7. Places resource and personnel order (LSC will place order based on IAP).  
8. Maintains Unit/Activity Log (ICS 214). |
Planning Meeting

The focus of the planning meeting will be to collect and exchange all information necessary to prepare an IAP for a Central City flood.

The planning chief (planning group spokesperson) will lead the planning meeting.

Each group will report its findings to the chief and turn over its ICS form(s).

The planning chief will be assisted by the instructor and other planning group members, who will begin assembling the plan as each group turns in its completed form(s).

The planning chief will use the Planning Meeting Checklist (included in the student manuals) to structure the meeting.

By the end of the meeting, the planning section should have all necessary information and should complete/assemble the IAP.

Once the planning group has completed the IAP and the instructor has checked its work, copies will be made and distributed to students. The plan will be reviewed using the Operations Briefing Agenda.
## Planning Meeting Checklist

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Responsible Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conduct/receive briefing on situation and resource status.</td>
<td>PSC</td>
</tr>
<tr>
<td>2. Set control objectives.</td>
<td>IC</td>
</tr>
<tr>
<td>3. Plot control lines, establish division boundaries, identify group assignments.</td>
<td>OSC</td>
</tr>
<tr>
<td>4. Specify tactics for each division.</td>
<td>OSC</td>
</tr>
<tr>
<td>5. Specify resources needed by division/group.</td>
<td>OSC, PSC</td>
</tr>
<tr>
<td>6. Specify incident facilities and reporting locations—plot on map.</td>
<td>OSC, PSC, LSC</td>
</tr>
<tr>
<td>7. Review resources and personnel order (for example, engines, specialized equipment, and overhead personnel).</td>
<td>LSC</td>
</tr>
<tr>
<td>8. Review communications, medical and traffic plan requirements.</td>
<td>PSC, LSC</td>
</tr>
<tr>
<td>9. Finalize, approve, and implement IAP.</td>
<td>PSC, IC, OSC</td>
</tr>
</tbody>
</table>

IC = Incident Commander  
OSC = Operations Section Chief  
PSC = Planning Section Chief  
LSC = Logistics Section Chief
### Incident Objectives

<table>
<thead>
<tr>
<th>1. Incident Name</th>
<th>2. Date Prepared</th>
<th>3. Time Prepared</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>4. Operational Period (Date/Time)</th>
</tr>
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<table>
<thead>
<tr>
<th>5. General Control Objectives for the Incident (Include Alternatives)</th>
</tr>
</thead>
</table>

<table>
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<tr>
<th>6. Weather Forecast for Operational Period</th>
</tr>
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<table>
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<tr>
<th>7. General Safety Message</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>8. Attachments (✓ If Attached)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization List (ICS 203)</td>
</tr>
<tr>
<td>Medical Plan (ICS 206)</td>
</tr>
<tr>
<td>Assignment List (ICS 204)</td>
</tr>
<tr>
<td>Incident Map</td>
</tr>
<tr>
<td>Communications Plan (ICS 205)</td>
</tr>
<tr>
<td>Traffic Plan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. Prepared By (Planning Section Chief)</th>
</tr>
</thead>
<tbody>
<tr>
<td>202 ICS 3-80</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>10. Approved By (Incident Commander)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM 3-87</td>
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</tbody>
</table>
C O T C
Operations
# ORGANIZATION ASSIGNMENT LIST

<table>
<thead>
<tr>
<th>POSITION</th>
<th>NAME</th>
<th>OPERATIONAL PERIOD (DATE/TIME)</th>
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<tbody>
<tr>
<td>4. Incident Commander and Staff</td>
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<td>INCIDENT COMMANDER</td>
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<td>SAFETY OFFICER</td>
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<td>INFORMATION OFFICER</td>
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<td>5. AGENCY REPRESENTATIVES</td>
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<td>AGENCY</td>
<td>NAME</td>
<td>DIVISION/GROUP</td>
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<td>6. PLANNING SECTION</td>
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<td>CHIEF</td>
<td>DEPUTY</td>
<td>DIVISION/GROUP</td>
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<td>RESOURCES UNIT</td>
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<td>DIVISION/GROUP</td>
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<td>TECHNICAL SPECIALISTS</td>
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<td>7. LOGISTICS SECTION</td>
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<td>CHIEF</td>
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<td>DIVISION/GROUP</td>
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<td>8. Operations Section</td>
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<tr>
<td>BRANCH I - Division/Groups</td>
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<td>LIAISON OFFICER</td>
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<tr>
<td>9. PREPARED BY (RESOURCES UNIT)</td>
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**203 ICS 1-82**
# C O T C

**Operations**

## Assignment List

<table>
<thead>
<tr>
<th>1. BRANCH</th>
<th>2. DIVISION/GROUP</th>
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<table>
<thead>
<tr>
<th>3. INCIDENT NAME</th>
<th>4. OPERATIONAL PERIOD</th>
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<tr>
<td></td>
<td>Date _____ Time _____</td>
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## Operations Personnel

<table>
<thead>
<tr>
<th>OPERATIONS CHIEF</th>
<th>DIVISION/GROUP SUPERVISOR</th>
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<table>
<thead>
<tr>
<th>BRANCH DIRECTOR</th>
<th>AIR TACTICAL GROUP SUPERVISOR</th>
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## Resources Assigned This Period

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<tr>
<th>STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR</th>
<th>LEADER</th>
<th>NUMBER PERSONS</th>
<th>TRANS. NEEDED</th>
<th>DROP OFF PT/TIME</th>
<th>PICK-UP PT/TIME</th>
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<tbody>
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## Control Operations

7. CONTROL OPERATIONS

## Special Instructions

8. SPECIAL INSTRUCTIONS

## Division/Group Communications Summary

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>FREQ.</th>
<th>SYSTEM</th>
<th>CHAN.</th>
<th>FUNCTION</th>
<th>FREQ.</th>
<th>SYSTEM</th>
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<thead>
<tr>
<th>DIV/GROUP TACTICAL</th>
<th>GROUND-TO-AIR</th>
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## Prepared By (Resources Unit)

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

10. PREPARED BY (RESOURCES UNIT) | 11. APPROVED BY (PLANNING SECTION CHIEF) | DATE | TIME |
|---------------------------------|----------------------------------------|------|------|

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SM 3-91
## INCIDENT RADIO COMMUNICATIONS PLAN

<table>
<thead>
<tr>
<th>1. INCIDENT NAME</th>
<th>2. DATE/TIME PREPARED</th>
<th>3. OPERATIONAL PERIOD DATE/TIME</th>
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### 4. BASIC RADIO CHANNEL UTILIZATION

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<th>SYSTEM/CACHE</th>
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<th>FUNCTION</th>
<th>FREQUENCY</th>
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<th>REMARKS</th>
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## 5. PREPARED BY (COMMUNICATIONS UNIT)

205 ICS 5/85

**COTC Operations**
# MEDICAL PLAN

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<tr>
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<th>2. DATE PREPARED</th>
<th>3. TIME PREPARED</th>
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## 5. INCIDENT MEDICAL AID STATIONS

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<th>PARAMEDICS</th>
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## 6. TRANSPORTATION

### A. AMBULANCE SERVICES

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<tr>
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### B. INCIDENT AMBULANCES

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## 7. HOSPITALS

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<th>ADDRESS</th>
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<th>PHONE</th>
<th>HELIPAD</th>
<th>BURN CENTER</th>
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## 8. MEDICAL EMERGENCY PROCEDURES

## 9. PREPARED BY (MEDICAL UNIT LEADER)

## 10. REVIEWED BY (SAFETY OFFICER)

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206 ICS 8-78
<table>
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SM 3-97
C O T C
Operations
## Operational Planning Worksheet

<table>
<thead>
<tr>
<th>4. DIVISION OR OTHER LOCATION</th>
<th>5. WORK ASSIGNMENTS</th>
<th>6. RESOURCES BY TYPE (SHOW STRIKE TEAM # &amp; ST)</th>
<th>7. REPORTING LOCATION</th>
<th>8. REQUESTED ARRIVAL TIME</th>
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215 ICS 9-66

<table>
<thead>
<tr>
<th>9. TOTAL RESOURCES REQUIRED</th>
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<tbody>
<tr>
<td>TOTAL RESOURCES ON HAND</td>
<td></td>
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<tr>
<td>TOTAL RESOURCES NEEDED</td>
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</table>
Activity 3.2:
Incident Action Planning
Student Assessment Sheet

While developing your part of the IAP, did you:

- Identify all problems related to functional assignments?
- Develop solutions for all problems you identified?
- Interact with other functional groups as necessary?
- Identify and handle all of your required tasks (listed on the IMT Objectives sheet)?
- Prepare for the planning meeting?

Notes:
Module Summary

The successful management of major incidents is greatly enhanced by the command and general staff’s knowledge and ability to perform the planning function.

Managing a major incident is not the same as day-to-day emergencies, just more of it. It takes preparation and pre-incident planning to ensure all contingencies have been anticipated and the use of resources is maximized.

Major emergencies up to and including third alarm incidents may not require a written IAP. However, major incidents require a fully expanded Incident Command System (ICS) organization, and a written plan is critical to ensure the incident objectives, strategies, and tactics are communicated to all incident personnel.

When done correctly, the planning process provides a guidance document (the IAP) that not only communicates the incident objectives but also provides for the safety and support of all incident personnel.
MODULE 3
APPENDIX A
STANDARD OPERATING
GUIDELINES FORMAT
CENTRAL CITY SOGS FOR:
EARTHQUAKE
HURRICANE
TERRORIST INCIDENT
TORNADO
DEVELOPMENT OF STANDARD OPERATING GUIDELINES AND SUGGESTED FORMAT

When developing Standard Operating Guidelines (SOGs), consideration should be given to their use when developing future Incident Action Plans (IAPs). An effort to capture all required information in the SOGs will reduce IAP development time during the actual incident.

When developing operating guidelines for various types of incidents, the following format will ensure consistency in content.

SOG Format

I. Introduction

Purpose (a statement containing an overview of guidelines, intent, and direction).

II. Procedures

A. Situation Assessment/Size up

This component is intended to provide company officers and battalion commanders with guidance on how to provide for security of department resources and personnel (while fulfilling first responder requirements during the initial stage of a major incident or disaster). Additionally, this component should contain guidelines for situation assessment (to provide command with information on what has happened—Is the incident going to get bigger or smaller? What are present and future resource and organizational needs?).
B. Incident Objectives

This component is intended to provide statements of guidance and direction necessary for the selection of appropriate strategies, and the tactical direction of resources.

1. Information is based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed.

2. It must be achievable and measurable, yet flexible enough to allow for strategic and tactical alternatives.

3. Objectives can be transferred to ICS Form 202 (when operating on an incident that requires a written IAP).

C. Organization

This component describes those of the Incident Command System (ICS) organization that may be deployed to effectively manage the particular type of incident/disaster.

(This portion of the SOG can be transferred to the ICS Form 203 when developing the written IAP.)

D. Strategies

This component provides a general plan or direction selected to accomplish incident objectives. Strategies should answer the question: “What needs to be done?”

Strategies help identify the general control objectives (on ICS Form 202) and tactics and assignments (on ICS Form 204) of the written IAP.
E. Tactics

This component consists of guidelines concerning incident deployment and direction of resources to accomplish a designated strategy. Tactical information should answer the question: “How will it be accomplished?”

This information can be transferred to (ICS Form 204 of) the written IAP.

F. Resources

This component is intended to provide guidelines for identifying, obtaining, and assigning the proper resource to accomplish tactical directions and staffing of critical positions.

This information will help in the development of ICS Forms 203, 204, and 206 as well as staffing of other positions critical to incident operations.

G. Communications

This describes radio channels or frequencies that will be used for each element of the incident organization.

This information can be transferred to ICS Form 205 (of the written IAP).

H. Incident Safety

This component is intended to identify personnel safety hazards associated with the incident/disaster type.

This information can be transferred to ICS Form 202 (of the written IAP). It can also be transferred in an IAP attachment page (usually titled “Safety Message”).
I. Medical Plan

This component should describe what needs to be done in the event of an injured firefighter.

This information can be transferred to the ICS Form 206 in the written IAP.

Once developed, the Incident Management Team (IMT) shall review the SOGs on an annual basis to ensure that the documents contain current information on such matters as lessons learned, department capability changes, new technologies, equipment, and mutual aid agreements.
CENTRAL CITY FIRE DEPARTMENT

STANDARD OPERATING GUIDELINES: EARTHQUAKE

I. Introduction

Purpose: To establish guidelines for the mobilization of resources and lifesaving operations immediately following an earthquake.

Note: The following guidelines should not preclude station personnel from taking the appropriate initiative before an earthquake notification by the dispatch center. There may be instances when an earthquake notification is delayed and the public’s best interest is served by taking immediate action.

II. Procedures

A. Situation Assessment/Size-Up

The intent of these guidelines is to provide company officers and battalion commanders with guidance on how to provide for their personnel and secure their administrative site. In addition, they are meant to provide dispatch and command with planning information on the availability of resources and company status in areas with greatest structural damage.

1. Company status and site survey (snapshot survey):
   When an earthquake occurs, the site supervisor and/or company officer shall:
   a. Ensure the safety of all personnel.
   b. Direct the movement of apparatus to a safe location.
c. Go on radio standby.

d. Determine the status of the site/facility utilities (gas, electricity, and water) and direct the stabilization of any found damage or leakage.

e. Direct a site survey to determine:

   * Injuries to personnel.
   * Availability of company or unit.
   * Availability of other resources at the site.
   * Damage to the administrative site using the Earthquake Intensity Rating Level Scale:

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>Nothing felt.</td>
</tr>
<tr>
<td>1</td>
<td>Earthquake felt, no damage.</td>
</tr>
<tr>
<td>2</td>
<td>Items thrown from shelves; windows broken.</td>
</tr>
<tr>
<td>3</td>
<td>Block walls down.</td>
</tr>
<tr>
<td>4</td>
<td>Structures shifted off foundations.</td>
</tr>
<tr>
<td>5</td>
<td>Structure collapse.</td>
</tr>
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</table>

f. Upon completion of the site survey, the company officer or site supervisor shall report the site survey information to the jurisdictional battalion commander within 10 minutes of the event or as soon as possible upon completion.

2. Jurisdictional Survey (Windshield Survey): Provides a situational survey of the preplanned locations for information on the condition of high life hazard occupancies, essential facilities, potential multicasualty incidents, status of major transportation arteries, response routes, and resource needs (for example, structure collapse, fires, hospital status, water systems, dams, and petro-chemical/tank farms).
a. Company officers shall complete a jurisdictional survey:

* When any administrative site in the battalion has experienced an earthquake with an earthquake intensity rating of a Level 2 or greater.

* When directed by dispatch.

* When directed by the jurisdictional battalion commander.

b. The jurisdictional survey shall be conducted with red lights and siren and completed in less than 30 minutes.

c. Company officers shall report jurisdictional survey information to the battalion commander within 30 minutes or immediately upon the completion of respective survey to allow for department-wide emergency planning.

d. The company officer shall only interrupt a primary jurisdictional survey to respond to an immediate life-threatening incident.

* The company officer shall assume command of the life-threatening incident and provide a status report to the battalion commander.

* The company officers shall, upon completion of the incident, report the unit’s status to the battalion commander and resume the jurisdictional survey.

e. The company officer shall report potential life-threatening incidents encountered during the jurisdictional survey immediately to the
battalion commander. These reports shall be made while continuing the survey.

f. The jurisdictional survey reports shall be made using the following communication priorities:

* Assigned tactical frequency.
* Assigned command frequency.
* Telephone.
* Relay via field units.

g. If unable to contact the jurisdictional battalion commander, the company officer should contact dispatch and relay the jurisdictional status.

h. If a company reports that they are unable to complete a jurisdictional survey, the battalion commander shall assign resources as needed to complete the survey.

i. Company officers shall track all responses and record all pertinent information on an ICS Form 214, including the address, type of call, and any other responding units.

3. Battalion Command: When an earthquake occurs the field battalion chief shall:

a. If not already alerted, ensure that dispatch is aware that an earthquake has occurred in their battalion.

b. When paged by dispatch, report to dispatch the earthquake intensity rating level for their immediate location within 5 minutes.
c. Be prepared to establish a battalion command post within 15 minutes of an earthquake and/or “ALL-CALL” notification:

* Battalion commanders shall maintain adequate personnel at battalion headquarters to receive site and jurisdictional survey reports and the establishment of a command post.

d. Determine resource needs and forward the request to dispatch if command has not been implemented.

e. Immediately, upon completion, report battalion site and jurisdictional survey information to dispatch and assistant chief or command if established using the following communication priorities:

  * Command channel.
  * Phone.
  * Tactical frequency.

f. If a company reports that they are unable to complete their jurisdictional survey, the battalion commander shall assign resources as needed to complete the survey.

B. Incident Objectives

The intent of these procedures is to provide guidance and direction necessary for the selection of appropriate strategies, and the tactical direction of resources.

1. All decision-making and action plans will be based on the departmental priorities of:
a. Protecting life.

b. Protecting property.

c. Protecting the environment.

d. Assisting other agencies.

2. Assign resources according to the following priorities:

a. Life-threatening incidents, such as rescues, persons trapped, collapsed buildings, and structure fires.

b. Potential life-threatening incidents, such as inside gas leaks and elevator rescues.

c. Non-life-threatening incidents, such as flooding, public assists, fire alarms, and gas leaks outside.

d. As units become available, reassign them using the same priorities listed above.

C. Organization

These guidelines describe what elements of the ICS organization may be deployed to effectively manage an earthquake.

1. Command structure—In the event of a large-area disaster, the command structure can be configured in several ways depending on the needs of the incident.

2. The decision to establish area command, a complex, or operate as a single large incident should be strongly influenced by where the planning, logistics, and finance functions would best serve the organization. The key to this decision
would be an organization that did not overlook a function and limited duplication of functions.

3. Develop an organization from the start to meet the expected needs of the incident (for example, if you think the incident will eventually require an area command organization, then start with area command).

4. Command shall develop broad objectives, strategies, and resource priorities to manage the entire disaster area.

D. Strategies

This component provides a general plan or direction selected to accomplish the incident objectives and answers: “What needs to be done?”

1. Establish the immediate priorities.

2. Develop a command organization.

3. Request adequate/specialized resources and do it early.

4. Establish incident facilities.

5. Establish communications with assisting agencies and exchange liaison officers with essential agencies.

6. Ensure that adequate safety measures are in place.

7. Update the fire chief and the city Emergency Operations Center (EOC) on a regular basis.

8. Ensure the development of a written IAP for each operational period.
E. Tactics

This component gives guidelines on the deployment and directing of resources on an incident to accomplish a designated strategy and answers: “How it will be accomplished.”

1. Incident assignments will be reduced to one unit for each incident.

2. The company officer shall notify the battalion commander of any significant working incidents, such as structure fires, hazardous materials, and persons trapped.

3. The company officer shall prioritize and handle outstanding incidents, documenting all actions on ICS form 214.

4. Battalion commanders shall establish a battalion command.
   a. Battalion commanders will not be responded on incidents by dispatch.
   b. Develop a written IAP using ICS Form 201.
   c. Display the situation information for significant incidents, such as fires, hazardous materials, and persons trapped.
   d. Establish an action item list.
   e. Monitor radio traffic and identify where battalion resources are committed.
   f. Develop an organization for the battalion, including possible division boundaries, staging locations, and number of overhead required.
g. Battalion commanders shall record all pertinent information on an ICS Form 214.

h. Prepare to brief the assistant fire chief or command.

F. Resources

The intent of these guidelines is for obtaining, and assigning of proper resources to accomplish the tactical directions and staffing of critical positions.

1. Off-duty personnel

a. If damage is localized:

  * Recall of shift personnel shall be altered so that those employees that live in the area least affected by the earthquake are recalled first.

  * Shift personnel who voluntarily call in for an assignment shall be recalled if necessary.

  * If possible, shift personnel shall be recalled to cover for employees who are on duty and who live in the area most affected by earthquake damage.

  * If proper relief is provided, or coverage can be made, the on-duty shift personnel may be released to go home to check on their families. These personnel shall return to their assignments after attending to the needs of their families.

b. If damage is extensive and widespread:
* Shift personnel shall report to their battalion headquarters after stabilizing their families or within 2 hours of the event.

c. Develop and implement a plan to use volunteers, both department and convergent.

G. Communications

The intent of these procedures is to expedite responses to alarms and to maintain an effective communications system in both the affected and unaffected areas of the community during a major incident or disaster.

1. Establish communication link with Central City Police Department, County Sheriff, and Central City EOC.

2. Establish communications with assisting agencies and cooperative agencies and exchange liaison officers with essential agencies.

3. Ensure department representative is responded to the Central City EOC.

4. Dispatch will relay to the Central City EOC (when it becomes operational) the jurisdictional survey information for processing.

5. Dispatch center to make contact with mutual aid departments and obtain a status of resource availability.

6. Dispatch shall also forward the survey information to the assistant fire chief or command, if not already advised.

7. The Dispatch Communication Plan has two (2) dispatch modes.
a. Mode 1: Normal dispatching procedures.

b. Mode 2: Disaster mode:

* During this mode, dispatch will send all responses to operations, branch, division, or group as directed by the IMT Incident Commander (IC).

* Dispatch shall not dispatch resources to obvious non-life-threatening incidents such as public assist and water leaks.

* All units go to radio standby.

* Dispatch may respond companies from adjoining jurisdictions to life-threatening incidents within another unit’s jurisdiction if that unit is committed to another life-threatening incident.

* Commanders may intervene, directing dispatch to assign multiple incidents to jurisdictional companies or multiple companies to a single incident.

H. Incident Safety

1. During an earthquake, all personnel shall seek the closest, safe refuge and assist others in doing the same.

2. All personnel in fire department structures shall report to the personnel reporting area as soon as it is safe to do so.

3. Factor in the possibility of a major aftershock in all decisions.
I. Medical Plan

This component should describe what needs to be done in the event of an injured firefighter.

1. Upon the activation of an IMT, a medical unit shall be established and a medical plan shall be developed using ICS Form 206.

2. The medical plan shall be communicated to all personnel down to the leader level.
CENTRAL CITY FIRE DEPARTMENT

STANDARD OPERATING GUIDELINES: HURRICANE

I. Introduction

Purpose: To establish guidelines for the mobilization of resources and lifesaving operations immediately following a hurricane.

II. Procedures

A. Situation Assessment/Size-Up

The intent of these procedures is to provide Central City Fire Department commanding officers with guidance on how to provide for their personnel and secure their administrative site. In addition, they are meant to provide the Central City Communication Center, Central City IMT, and Central City EOC with planning information on the availability of resources and company status in areas with greatest structural damage.

1. Company status and site survey (snapshot survey). Upon the passing of a hurricane event and after sustained winds have diminished below 40 miles per hour, the site supervisor and/or commanding officer shall:

a. Ensure the safety of all personnel.

b. Direct the movement of apparatus to a safe location.

c. Go on radio standby and determine the status of the site/facility utilities (gas, electricity, and water) and direct the stabilization of any found damage or leakage.
d. Direct a site survey to determine:

* Injuries to personnel.

* Availability of company or unit.

* Availability of other resources at the site (fire station).

e. Upon completion of the site survey, the company officer or site supervisor shall report the site survey information to the communications center, IMT, and the EOC.

2. Jurisdictional Survey (Windshield Survey):
Provides a situational survey of the pre-planned locations for information on the condition of high life hazard occupancies, essential facilities, potential multicasualty incidents, status of major transportation arteries, response routes, and resource needs (for example, structure collapse, fires, hospital status, water systems, dams, and petro-chemical/tank farms). Commanding officers shall complete a jurisdictional survey:

a. Upon hurricane winds diminishing to sustained winds below 40 mph.

b. When directed by communications center.

c. When directed by the IMT.

d. Jurisdictional survey shall be conducted with red lights and siren.

e. Commanding officer shall report jurisdictional survey information to the communications center, IMT, and the EOC IMMEDIATELY after the completion of respective survey (to
allow for department-wide emergency planning).

f. Commanding officer shall interrupt a primary jurisdictional survey only to respond to an immediate life-threatening incident.

g. Commanding officer shall assume command of the life-threatening incident and provide a status report to the IMT.

h. Commanding officer shall (upon completion of the incident) report the unit’s status to the communications center and IMT and resume the jurisdictional survey.

i. Commanding officer shall report potential life-threatening incidents (encountered during the jurisdictional survey) immediately to the communications center and IMT. These reports shall be made while continuing the survey.

j. Jurisdictional survey reports shall be made using the following communication priorities:

   * Assigned radio frequency.
   * Telephone.
   * Cellular telephone.

k. If a commanding officer reports that they are unable to complete a jurisdictional survey, the IMT shall assign resources as needed to complete the survey.

3. Area Command: It is anticipated that an area command structure will be established following a hurricane event.
a. Area command shall develop broad objectives, planning concerns, and resource priorities to manage the entire disaster area.

b. Area command shall be located in the EOC.

4. Incident Management Teams: Two, full IMTs shall be established to manage the consequences of the hurricane event.

   a. IMTs will geographically split Central City.

   b. East IMT will have responsibility for the area east of the Roaring River.

   c. West IMT will have responsibility for the area west of the Roaring River.

   d. Each IMT shall:

      * Develop an organization from the start to meet the expected needs of the incident.

      * Develop strategies, and resource priorities to manage their area of responsibility.

      * Develop a written IAP for each operational period.

      * Establish communications with assisting agencies.

      * Ensure that adequate safety measures are in place.

      * Update the area commander and EOC on a regular basis.

5. Strategic Considerations: The intent of these procedures is to guide communications center,
IMT, and commanding officers in the triage and decision-making necessary to respond to the consequences of a hurricane event

a. Department priorities.

All decision-making and action plans will be based on the departmental priorities of:

* Protecting life.
* Protecting property.
* Protecting the environment.
* Assisting other agencies.

b. Assigning resources.

Assign resources according to the following priorities.

* Life-threatening incidents, such as rescues, people trapped, collapsed buildings, and structure fires.
* Potential life-threatening incidents, such as gas leaks and elevator rescues.
* Non-life-threatening, such as flooding, public assists, and fire alarms.

B. Incident Safety

1. During a hurricane, all personnel shall seek the closest, safe refuge and assist others in doing the same.
2. All personnel in fire department structures shall report to the Personnel Reporting Area as soon as it is safe to do so.

C. Resources

Off-duty Personnel:

1. If damage is localized recall of shift personnel shall be altered so that those employees that live in the area least affected by the hurricane are recalled first.

2. Shift personnel who voluntarily call in for an assignment shall be recalled if necessary.

3. If possible, shift personnel shall be recalled to cover for employees who are on duty and who live in the area most affected by hurricane damage. If proper relief is provided, or coverage can be made, the on-duty shift personnel may be released to go home to check on their families. These personnel shall return to their assignments after attending to the needs of their families.

4. If damage is extensive and widespread, shift personnel shall report to their battalion headquarters after stabilizing their families or within 2 hours of the event.

5. Develop and implement a plan to use volunteers – both department and convergent.
CENTRAL CITY FIRE DEPARTMENT

STANDARD OPERATING GUIDELINES: TERRORISM

I. Introduction

Purpose: To establish guidelines for the mobilization of resources and lifesaving operations immediately following terrorist incident.

II. Procedures

A. Situation Assessment/Size-Up

The intent of these guidelines is to provide company officers and incident command with guidance on how to care for the security of department personnel and resources while making an incident assessment during the initial stage of a major incident or disaster.

1. First arriving company: responsible for providing the initial size-up.

2. Approach uphill/upwind/upstream: select a route that will take you uphill, upwind, and upstream from the incident.

3. Consider worst case: all unknown substances will be considered a lethal substance until proven otherwise.

4. Prepare for immediate egress: position apparatus for immediate egress and maximum personnel safety.

5. Protective clothing: all personnel shall be in full PPE with SCBA.
6. The size-up should answer the following questions:

   a. What happened?
   
   b. Is the incident going to get bigger or smaller?
   
   c. What are present and future resource needs?
   
   d. What are present and future organizational needs?

7. Critical cues: size-up should consider the following critical cues:

   a. Weather—wind direction, speed, temperature, and humidity.
   
   b. Plume direction.
   
   c. Topography.
   
   
   e. Number of casualties.
   
   f. Victim signs and symptoms (that could indicate NBC agents).
   
   g. Witness statements or observations.
   
   h. Time of day.

B. Incident Objectives

The intent of this component is to provide statements of guidance and direction necessary for the selection of appropriate strategies, and the tactical direction of resources.
1. Protection of life.

2. Protection of the environment.

3. Protection of the crime scene.

4. Protection of property and equipment.

C. Organization

An NBC terrorist incident may require command to anticipate the full expansion of the ICS with unified command to include multijurisdiction and multi-agencies. Develop an organization from the start to meet the expected needs of the incident (for example, if you think the incident will eventually require a fully expanded ICS with unified command, then start it that way).

1. Command Post and Staging Locations: the first arriving command officer should select appropriate command post and staging locations. These locations should be uphill/upwind from the incident and large enough to accommodate the resources for unified command. Dispatcher should provide this information to all assisting agencies.

   Establish the incident facilities as far away as possible to reduce exposure or possibility of relocation due to wind change.

2. Unified Command: the unified command is responsible for notifying the appropriate agencies, acquiring the necessary resources, and coordinating all of the activities at the scene to properly handle the incident. Scene management responsibilities continue until the emergency has ended and order has been restored.
3. Cleanup/Final Clearance: the cleanup of an NBC incident is the responsibility of the Department of Health Services who will coordinate with state, Federal, and private agencies to obtain an all clear on the equipment and property involved.

Federal assets will be needed for conducting low level monitoring, detection, and identification to verify and certify the site is safe to reoccupy.

4. Crime Scene: a terrorist incident is a crime scene. Law enforcement, headed by the Federal Bureau of Investigation, is responsible for the preservation of evidence and security of the crime scene.

5. Evacuation: the responsibility for evacuation usually rests with law enforcement; however, the fire department IC is almost always consulted before evacuation is initiated. The IC should make the decision to evacuate or shelter-in-place early on in the incident. If the IC decides to evacuate, he or she should meet with law enforcement to plan:

   a. The area to be evacuated.
   
   b. The priorities of the evacuation.
   
   c. The access and egress routes.
   
   d. The location of evacuation shelters.

D. Strategies

This component provides a general plan or direction selected to accomplish the incident objectives. A strategy should answers the question: “What needs to be done?”

1. Establish the immediate priorities (safety first—then rescue).
2. Develop a command organization.

3. Make notifications early.

4. Request adequate/specialized resources (and do it early).

5. Establish incident facilities.

6. Establish communications with assisting agencies and exchange liaison officers with essential agencies.

7. Ensure that adequate safety measures are in place.

8. Update the fire chief and City EOC on a regular basis.

9. Ensure the development of an IAP for each operational period.

E. Tactics

This component gives guidelines on the deployment and directing of resources to accomplish a designated strategy. A tactic should answer the question: “How it will be accomplished?”

1. Rescue:

   a. Rescue Plan: a rescue plan will be formulated whenever practical. Rescue team(s) will be briefed on the plan before entry. The minimum rescue plan should identify:

      * The boundaries of the exclusion zone (hot zone).
* The location of refuge area(s) within the exclusion zone.

* The location of the contamination reduction zone (outside of the exclusion zone).

* The safe refuge area within the contamination reduction zone.

* The location of the support zone.

* The location of access control points (into and out of these zones).

b. Rescue teams should approach a spill from uphill/upwind whenever possible.

c. Rescue team leaders will be responsible for providing the IC with ongoing status reports.

d. Egress from the exclusion zone (for all victims and rescue team personnel) will be through the decontamination corridor into a contamination reduction zone.

e. If contaminated, victims must be moved before the establishment of a decontamination corridor. They should be moved to a predetermined location of safe refuge (within the exclusion zone) where they can remain until the decontamination corridor can be established.

f. Noncontaminated victims should be moved to the safe refuge area located in the contamination reduction zone.

2. Make notifications. Early notification of type and magnitude of incident to the communications center, hospitals, and other medical facilities (to
warn of mass casualties and self transported contaminated victims) is important.


a. Isolate the area.

* Establish exclusion and contamination reduction zones.

* Give specific verbal instructions and warn people of dangers.

* Establish and maintain crowd control.

* Walking casualties or possible exposed people should be corralled upwind, upgrade, and segregated.

They should be held in a safe refuge area to await decontamination.

* Within the limits of your PPE, carry out non-ambulatory victims and conduct rescue operations.

* Small children and the elderly are more susceptible to toxic effects and therefore may need special attention.

b. Deny entry.

* Cordon off the area (to prevent people from entering or leaving).

* The site (and down wind hazard area) must be secured and entry restricted.

c. Shelter-in-place versus evacuation. Consider:
* Wind direction and speed.
* Population to be moved.
* Hospitals and schools in the path.
* Where to evacuate to, how long it will take, and what means of transportation would be used.
* If the chemical agent is in the area.

d. Protect the environment.
* Runoff should be contained when possible (but don’t delay decontamination of victims to do so).
* Contain away from leading edge of runoff (to reduce exposure of personnel).

e. Protect the crime scene.
* Remember, this is a crime scene—every effort should be taken to preserve evidence that could be used to apprehend and prosecute the perpetrators.

4. Decontamination considerations.

a. NBC agents could require decontamination of numerous people (possibly hundreds or even thousands).

b. Due to their high toxicity and fast action, NBC agents must be rapidly removed to reduce exposure.

c. The following is a list of decontamination considerations:
* Time is critical.

* Need large area out of the exclusion zone. Area should be uphill and upwind so that contaminated runoff will flow back into the already contaminated area.

* Communicate by loudspeaker/PA (for example, what you want the exposed people to do).

* Casualties must be kept out of the exclusion zone (but still controlled).

* Isolate upwind, uphill, upstream.

* Separate those with symptoms from those with no symptoms.

* Use hose lines and elevated streams (low pressure fog) to rain down (like a shower) on the people. Arms should be out and legs spread. Wash top down, blot agent off in a pinching motion, and do not rub.

* If available, 1:10 solution of household bleach is best to remove (and neutralize) chemical and biological contamination. Use one gallon of bleach to ten gallons of water.

* Use soap and water for radiological agents.

* Wetting people down (prior to stripping) will help keep the agent on the clothes.

* Have them strip down to their undergarments—note that pantyhose go
(approximately 80 percent of contamination will be removed).

* Expect modesty to be a problem (separate sites for men and women/use screens for separation).

* Collect personnel items, bag, and identify.

* Provide cover after decontamination (for example, blankets and sheets).

* Establish defensive control operations (such as diking) to contain runoff and limit the spread of contamination. Anticipate runoff to enter sewer system, streams, and rivers and notify proper authorities.

* Provide emergency medical care after decontamination is completed.

* Decedents and their personnel effects will be managed by the coroner’s office; however, contaminated bodies or items shall need to go through decontamination first.

* Need Federal assets in conducting low level monitoring, detection, and identification (to verify and certify that the site is safe to re-occupy).

5. EMS considerations

   a. Establish a medical branch or group.

   * Establish triage, treatment, and transportation of victims in a clean area.

   * Large enough to hold all casualties.
* Locate the treatment area between the triage area and the transportation area.

b. Ensure all responders are aware of the signs and symptoms.

c. Assume victims may still have some contamination on them.

d. Wear PPE and use mechanical ventilation.

e. Drug therapy is required to stabilize casualties.

f. Interface with local hospitals receiving casualties.

g. Consider mass transit to move casualties.

h. After working in EMS areas, consider yourself contaminated and go through decontamination.

i. Limit the number of responders exposed to victims.

j. Keep contaminated clothing away from victim’s face when removing (cut away).

6. Chemical Downwind Hazard Analysis

a. Depending on the concentration of the agent, people downwind of the release can become victims. However, just as with any HAZMAT incident, the cloud will eventually be diluted by air to the point that it poses no further hazard.

b. The weather plays a major role in determining the potential for down wind contamination hazards. Just as with your everyday HAZMAT incident, wind speed, direction, temperature,
and humidity are all factors that must be considered.

c. At wind speeds below 6 mph, the cloud tends to disperse evenly in all directions around the release. At speeds above 6 mph, the cloud tends to form a “pear shaped” plume down wind.

d. The *North American Emergency Response Guidebook* is a good reference to help establish the downwind hazard area. When using this reference you can follow these steps:

**Step 1:** Look up the chemical identification number in the blue pages. If you don’t know the exact agent, or its name is not there, use the agent class.

* Nerve agents ID 2810.
* Blood agents ID 1051.
* Blister agents ID 2810.
* Choking agents ID 1076.

If unknown agent or class, use ID 2810 until more exact information is available.

**Step 2:** Look up the identification number in green pages and read across to establish the initial isolate and protect distances. A small spill is less than 55 gallons, and a large spill is more than 55 gallons.

**Step 3:** On a map of the incident draw a circle, to scale, using the isolate distance as the radius. The center of the circle will be the center of the release site. Draw a line from the center of the circle in the direction of the wind and indicate
the wind speed above the line. Then, using the
protect distance, draw a line perpendicular to
the wind direction through the center of the
circle. This line represents the upwind edge of a
square box which is the protect distance on each
side. You have now identified the potential
hazard area and the toxic plume should pass
somewhere within this area. You can identify
the leading edge of the plume by multiplying
the wind speed by the time.

Now that you have a prediction of where the
hazard might exist, you can decide if you are
going to evacuate or shelter in place.

e. Radiological and biological hazard predictions
can be determined by contacting the National
Response Center (NRC) for technical
assistance.

F. Resources

The intent of these guidelines is to provide for
identifying, obtaining, and assigning of proper
resources to accomplish the tactical directions and
staffing of critical positions.

Off-duty personnel:

1. Personnel working in full PPE and Level A suits
can become exhausted. Consider recall of off-duty
personnel for crew rotation and rehabilitation and
do it early.

2. Recall of shift personnel shall be altered so that
those employees that live in the area least affected
by the terrorist incident are recalled first.

3. Shift personnel who voluntarily call in for an
assignment shall be called if necessary.
4. If possible, shift personnel shall be recalled to cover for employees who are on duty and who live in the area or have family members affected by the terrorist attack.

G. Communications

The intent of these guidelines is to insure adequate communications is established and maintained to support the incident.

1. Establish communication links with Central City Police Department, County Sheriff, and Central City EOC.

2. Establish communications with assisting agencies and cooperative agencies and exchange liaison officers with essential agencies.

3. Ensure department representative is responded to the Central City EOC.

4. Dispatch center to make contact with mutual aid departments and obtain a status of resource availability.

H. Incident Safety

The intent of these guidelines is to identify the personnel safety hazards associated with a terrorist incident.

1. Limit the number of responders who will be exposed to any NBC agents.

2. Stay upwind, uphill, and up stream.

   a. A minimum safe distance from a chemical attack is 700 feet (exclusion zone) and a
minimum of 1/3 mile (1,750 feet) for an explosive.

b. Be aware of ventilation exhaust ports from the incident site such as from buildings and subways.

3. In no case should you come in contact with a victim without the proper PPE to safely do the job.

4. Only Level A protection is recommended for initial entry into a chemical agent exclusion zone until the actual agent and health risk is known. To adjust the level of equipment you need advanced detection equipment.

5. Structural firefighting PPE can be compared to OSHA level C protection and will protect against inhalation exposure but only provides limited splash protection and no protection against skin absorption.

   May provide adequate protection against airborne biological agents and some radiological materials.


7. After working in the hot or warm zone, consider yourself contaminated and go through decontamination. When in doubt, decontaminate!

8. Be alert for signs and symptoms of agent exposure among responders.

9. Follow up with medical assessments after incident to ensure response personnel have not been contaminated with agent.
I. Medical Plan

The intent of these guidelines is to describe what needs to be done in the event of an injured firefighter.

1. All supervisors shall be watchful of their personnel for signs of exposure to chemical agents.

2. All personnel that exhibit signs or symptoms of exposure to and NBC agents must immediately go through decon and then receive the appropriate treatment.

3. Do not transport contaminated incident personnel without being decontaminated.

4. Incident injuries, not related to an NBC agent, that require emergency treatment should be transported to the closest appropriate receiving facility. Other more minor injuries shall be treated by the medical unit as identified in the incident IAP.

5. All designated medical units will have rehab capability.
CENTRAL CITY FIRE DEPARTMENT

STANDARD OPERATING GUIDELINES: TORNADO

I. Introduction

**Purpose:** To establish guidelines for the mobilization of resources and lifesaving operations immediately following a tornado touchdown event.

II. Procedures

A. Situation Assessment/Size-Up

The intent of these procedures is to provide Central City Fire Department commanding officers with guidance on how to provide for their personnel and secure their administrative site. In addition, they are meant to provide the Central City communications center, Central City Fire Department IMT, and Central City EOC with planning information on the availability of resources and resources status in areas with greatest damage.

1. Company status and site survey (snapshot survey): Upon a tornado touchdown occurring, the site supervisor and/or company officer shall:

   a. Ensure the safety of all personnel.
   
   b. Direct the movement of apparatus to a safe location.
   
   c. Go on radio and determine the status of the site/facility utilities (gas, electricity, and water) and direct the stabilization of any found damage or leakage.
d. Direct a site survey to determine:

- Injuries to personnel.
- Availability of company or unit.
- Availability of other resources at the site.
- Damage to the administrative site (fire station).

e. Upon completion of the site survey, the commanding officer shall report the site survey information to the communications center, IMT, and EOC.

2. Jurisdictional Survey (Windshield Survey):
   Provides a situational survey of the preplanned locations for information on the condition of high life hazard occupancies, essential facilities, potential multicasualty incidents, status of major transportation arteries, response routes, and resource needs (for example, structure collapse, fires, hospital status, water systems, dams, and petro-chemical/tank farms). Commanding officers shall complete a jurisdictional survey.

a. After a tornado touchdown event has occurred and it is deemed safe to respond.

b. When directed by the dispatch center.

c. When directed by the IMT.

d. Jurisdictional survey shall be conducted with red lights and siren.

e. Commanding officers shall report jurisdictional survey information to the communications
Operations

center, IMT, and EOC immediately upon the completion of respective survey to allow for department-wide emergency planning.

f. Commanding officer shall interrupt a primary jurisdictional survey only to respond to an immediate life-threatening incident.

g. Commanding officer shall assume command of the life-threatening incident and provide a status report to the IMT.

h. Commanding officer shall (upon completion of the incident) report the unit’s status to the communications center and IMT and then resume the jurisdictional survey.

i. Commanding officer shall report potential life-threatening incidents encountered during the jurisdictional survey immediately to the communications center and IMT. These reports shall be made while continuing the survey.

j. Jurisdictional survey reports shall be made using the following communication priorities:

* Assigned radio frequency.

* Telephone.

* Cellular telephone.

k. If a commanding officer reports that he or she is unable to complete a jurisdictional survey, the IMT shall assign resources as needed to complete the survey.

B. Incident Command: After a tornado touchdown occurs the CCFD IMT shall be activated and assembled at a command post site outside of the touchdown area.
C. Organization

1. Geographical or functional branches are to be established for command and control of damaged areas.

2. Establish an incident staging area.

3. Maintain adequate personnel at the command post site and to receive site and jurisdictional survey reports.

4. Determine resource needs and request resources from the communications center.

5. All incident resources shall respond to the incident staging area for deployment into branches as required.

D. Strategies

The intent of these procedures is to guide communications center, IMT, and commanding officers in the triage and decision-making necessary to respond to a tornado touchdown incident.

1. Department Priorities: All decision-making and action plans will be based on the departmental priorities of:

   a. Protecting life.

   b. Protecting property.

   c. Protecting the environment.

   d. Assisting other agencies.
2. Assigning Resources: Assign resources according to the following priorities.

   a. Life-threatening incidents, such as rescues, persons trapped, collapsed buildings, and structure fires.

   b. Potential life-threatening incidents, such as gas leaks and elevator rescues.

   c. Non-life-threatening incidents, such as flooding, public assists, and fire alarms.

3. Incident Commander: In the event of a tornado touchdown incident the IC shall:

   a. Develop an organization from the start to meet the expected needs of the incident.

   b. Develop broad objectives, strategies, and resource priorities to manage the entire disaster area.

   c. Ensure the development of a written IAP for each operational period.

   d. Determine incident objectives and strategy.

   e. Establish the immediate priorities.

   f. Establish communications with assisting agencies.

   g. Ensure that adequate safety measures are in place.

   h. Update the EOC on a regular basis.
4. Incident Management Team
   
a. Develop a written IAP using ICS Form 201.
   
b. Display the situation information for significant incidents, such as fires, hazardous materials, and persons trapped.
   
c. Establish an action item list.
   
d. Monitor radio traffic and identify where resources are committed.
   
e. Develop and implement a plan to use volunteers (departmental or convergent).
   
f. Branch directors shall record all pertinent information on an ICS Form 214.
   
g. Prepare to brief the EOC.

E. Resources

   Off-duty personnel:
   
1. If damage is localized, recall of shift personnel shall be altered so that those employees that live in the area least affected by the tornado touchdown are recalled first.
   
2. Shift personnel who voluntarily call in for an assignment shall be recalled if necessary.
   
3. If possible, shift personnel shall be recalled to cover for employees who are on duty and who live in the area most affected by the tornado touchdown. If proper relief is provided, or coverage can be made, the on-duty shift personnel may be released to go home to check on their families.
These personnel shall return to their assignments after attending to the needs of their families.

4. If damage is widespread, shift personnel shall report to their battalion headquarters after stabilizing their families or within 2 hours of the event.

5. Develop and implement a plan to use volunteers, both department and convergent.

F. Incident Safety

1. Upon receiving a tornado warning, all personnel shall seek safe refuge below ground if possible and assist others in doing the same.

2. All personnel in fire department structures shall report to the Personnel Reporting Area as soon as it is safe to do so.

3. Factor in the possibility of a second tornado touch down.
CENTRAL CITY

HURRICANE INCIDENT

6-25-98

(SAMPLE INCIDENT ACTION PLAN)
OBJECTIVES

1. INCIDENT NAME
   Area
   Hurricane INC

2. DATE PREPARED
   6/25/98

3. TIME PREPARED

4. OPERATIONAL PERIOD (DATE/TIME)
   First

5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)
   - Provide for life safety of both the public & incident responders.
   - Provide for the mitigation of life threatening hazards.
   - Provide for the protection of the environment.
   - Protect & minimize damage to property & equipment.

6. OBJECTIVES FOR THIS OPERATIONAL PERIOD.
   - Ensure safety of public & responders.
   - Prioritize requests--Life, Environment, Property, Equipment.
   - Provide EMS care.
   - Prevent conflagration--hold fires to building of origin.
   - Ensure availability of firefighting water.
   - Mitigate, stabilize, isolate all life-threatening hazards.
   - Provide assistance to other agencies.
   - Stay visible to public & provide assistance and reassurance.

7. WEATHER FORECAST FOR OPERATIONAL PERIOD

8. GENERAL SAFETY MESSAGE
   - Use caution in low-lying areas that are prone to flooding.
   - Response routes will have debris obstructing driving lane.
   - Be observant for haz mat releases.
   - All floodwater shall be considered contaminated from haz mat & sewage.
   - All personnel entering floodwater must go through decon.
   - Slow down & think before you act.

9. ATTACHMENTS (√ IF ATTACHED)
   - [%] ORGANIZATION LIST (ICS 203)
   - [%] MEDICAL PLAN (ICS 206)
   - [%] ASSIGNMENT LIST (ICS 204)
   - [%] INCIDENT MAP
   - [%] COMMUNICATIONS PLAN (ICS 205)
   - [%] TRAFFIC PLAN

ICS 202 5.94

10. PREPARED BY (PLANNING SECTION CHIEF)
    Ted Hoffman

11. APPROVED BY (INCIDENT COMMANDER)
    Dave Evans
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203 ICS 1-82

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1. BRANCH
Search & Rescue
Suppression

2. DIVISION/GROUP
Suppression

ASSIGNMENT LIST

3. INCIDENT NAME
West IC
Hurricane Inc.

4. OPERATIONAL PERIOD
First

DATE 6/25/98

TIME

5. OPERATIONS PERSONNEL

OPERATIONS CHIEF Ross Hawkins

DIVISION/GROUP SUPERVISOR

BRANCH DIRECTOR

AIR TACTICAL GROUP SUPERVISOR

6. RESOURCES ASSIGNED THIS PERIOD

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<th>NUMBER PERSONS</th>
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</table>

7. CONTROL OPERATIONS
- Prioritize all requests for service--life, environment, property, equip.
- Provide initial EMS.
- Prevent conflagration--hold fires to building of origin.
- Ensure availability of firefighting water.
- Mitigate, stabilize, isolate all life-threatening hazards.
- Stay visible to public & provide assistance & reassurance.
- Provide assistance to other agencies.

8. SPECIAL INSTRUCTIONS
- Keep Branch Director advised of availability of resources & need for additional/specialized resources
- Record incident activity on ICS Form 214.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

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<tr>
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<th>SYSTEM</th>
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10. PREPARED BY (RESOURCES UNIT)
Ellery Stowell

11. APPROVED BY (PLANNING SECTION CHIEF)
Floyd Lecuyer

DATE 6/25/98
TIME

ICS 204 1-82
**C O T C**

**Operations**

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<th>2. DIVISION/GROUP</th>
<th>ASSIGNMENT LIST</th>
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<thead>
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<tr>
<td>- Provide emergency medical services to those in need.</td>
</tr>
<tr>
<td>- Provide triage of the injured using the START system.</td>
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<tr>
<td>- Provide technical assistance on EMS issues to first responders.</td>
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<tr>
<td>- Assist other agencies.</td>
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<th>8. SPECIAL INSTRUCTIONS</th>
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<td>- Order all medical supplies through Logistics.</td>
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<tr>
<td>- Use BLS personnel where appropriate to conserve the use of ALS resources.</td>
</tr>
<tr>
<td>- Maintain resource status with chain of command.</td>
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<td>- Record incident activity on ICS Form 214.</td>
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ICS 204 1-82

B-9 (Module 3)
**1. BRANCH**  
S & R Suppression

**2. DIVISION/GROUP**  
USAR

**ASSIGNMENT LIST**

**3. INCIDENT NAME**  
West IC  
Hurricane Inc.

**4. OPERATIONAL PERIOD**  
**DATE** 6/25/98  
**TIME**

**5. OPERATIONS PERSONNEL**

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</table>

**7. CONTROL OPERATIONS**

- Strategic priorities—Life, Environment, Property, Equipment.
- Provide technical rescue services to those in need.
- Provide technical assistance to first responders.
- Assist assistance to other agencies.

**8. SPECIAL INSTRUCTIONS**

- All confined spaces shall be considered IDLH until proven otherwise by atmospheric monitors.
- Use first responders to complete non-technical tasks to conserve on use of USAR specialist resources.
- Maintain resource status with chain of command.
- Record incident activity on ICS Form 214.

**9. DIVISION/GROUP COMMUNICATIONS SUMMARY**

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**10. PREPARED BY (RESOURCES UNIT)**  
E. Stowell

**11. APPROVED BY (PLANNING SECTION CHIEF)**  
Floyd Lecuyer  
**DATE** 6/25/98  
**TIME**
### Assignment List

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| 7. Control Operations |

- Provide emergency medical services to those in need.
- Provide triage of the injured using the START system.
- Provide technical assistance on EMS issues to first responders.
- Assist other agencies.

| 8. Special Instructions |

- Order all medical supplies through Logistics.
- Use BLS personnel where appropriate to conserve the use of ALS resources.
- Maintain resource status with chain of command.
- Record incident activity on ICS Form 214.

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10. Prepared By (Resources Unit)

| Ellery Stowell |

11. Approved By (Planning Section Chief)

| Floyd Lecuyer | 6/25/98 |

B-11 (Module 3)
# C O T C

## Operations

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<td>AIR TACTICAL GROUP SUPERVISOR</td>
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<tbody>
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<thead>
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<td>- All haz mat incidents shall be managed using the standardized tactical approach.</td>
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<td>- Maintain resource status with chain of command.</td>
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<td>- Record incident activity on ICS Form 214.</td>
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<th>4. OPERATIONAL PERIOD</th>
<th>First</th>
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**5. OPERATIONS PERSONNEL**

- **OPERATIONS CHIEF**: Ted Korgenski
- **DIVISION/GROUP SUPERVISOR**
- **BRANCH DIRECTOR**
- **AIR TACTICAL GROUP SUPERVISOR**

**6. RESOURCES ASSIGNED THIS PERIOD**

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<th>STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR</th>
<th>LEADER</th>
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</table>

**7. CONTROL OPERATIONS**

- Prioritize all requests for service--Life, Environment, Property, Equipment.
- Provide initial EMS.
- Prevent conflagration--hold fires to building of origin.
- Ensure availability of firefighting water.
- Mitigate, stabilize, isolate all life-threatening hazards.
- Stay visible to public & provide assistance & reassurance.
- Provide assistance to other agencies.

**8. SPECIAL INSTRUCTIONS**

- Keep branch director advised of availability of resources & need for additional/specialized resources.
- Record incident activity on ICS Form 214.

**9. DIVISION/GROUP COMMUNICATIONS SUMMARY**

<table>
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<tr>
<th>FUNCTION</th>
<th>FREQ.</th>
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**10. PREPARED BY (RESOURCES UNIT)**

- **D. Payton**

**11. APPROVED BY (PLANNING SECTION CHIEF)**

- **T. McClimens**

---

**B-14 (Module 3)**
1. **BRANCH**
   - **S & R Suppression**

2. **DIVISION/GROUP**
   - **USAR**

3. **INCIDENT NAME**
   - **East IC**
   - **Hurricane Inc.**

4. **OPERATIONAL PERIOD**
   - **First**
   - **DATE**
     - 6/25/98
   - **TIME**

5. **OPERATIONS PERSONNEL**
   - **OPERATIONS CHIEF**
     - Ted Korgenski
   - **BRANCH DIRECTOR**
   - **DIVISION/GROUP SUPERVISOR**
   - **AIR TACTICAL GROUP SUPERVISOR**

6. **RESOURCES ASSIGNED THIS PERIOD**

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</table>

7. **CONTROL OPERATIONS**
   - Strategic priorities--Life, Environment, Property, Equipment.
   - Provide technical rescue services to those in need.
   - Provide technical assistance to first responders.
   - Provide assistance to other agencies.

8. **SPECIAL INSTRUCTIONS**
   - All confined spaces shall be considered IDLH until proven otherwise by atmospheric monitors.
   - Use first responders to complete non-technical tasks to conserve on use of USAR specialist resources.
   - Maintain resource status with chain of command.
   - Record incident activity on ICS Form 214.

9. **DIVISION/GROUP COMMUNICATIONS SUMMARY**

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10. **PREPARED BY (RESOURCES UNIT)**
    - D. Payton
11. **APPROVED BY (PLANNING SECTION CHIEF)**
    - T. McClimens
    - **DATE**
      - 6/25/98
    - **TIME**
### ASSIGNMENT LIST

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#### 5. OPERATIONS PERSONNEL

- OPERATIONS CHIEF: **Ted Korgenski**
- DIVISION/GROUP SUPERVISOR: [Blank]
- BRANCH DIRECTOR: [Blank]
- AIR TACTICAL GROUP SUPERVISOR: [Blank]

#### 6. RESOURCES ASSIGNED THIS PERIOD

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#### 7. CONTROL OPERATIONS

- Provide emergency medical services to those in need.
- Provide triage of the injured using the START system.
- Provide technical assistance on EMS issues to first responders.
- Assist other agencies.

#### 8. SPECIAL INSTRUCTIONS

- Order all medical supplies through Logistics.
- Use BLS personnel where appropriate to conserve the use of ALS resources.
- Maintain resource status with chain of command.
- Record incident activity on ICS Form 214.

#### 9. DIVISION/GROUP COMMUNICATIONS SUMMARY

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#### 10. PREPARED BY (RESOURCES UNIT)

- **D. Payton**

#### 11. APPROVED BY (PLANNING SECTION CHIEF)

- **T. McClimens**
  - DATE: 6/25/98
  - TIME: [Blank]
## COTC Operations

### ASSIGNMENT LIST

| 1. BRANCH | EMS |
| 2. DIVISION/GROUP | Patient Transportation |
| 3. INCIDENT NAME | East IC Hurricane Inc. |
| 4. OPERATIONAL PERIOD | First |
| DATE | 6/25/98 |
| TIME | |

### OPERATIONS PERSONNEL

- **OPERATIONS CHIEF**: Ted Korgenski
- **DIVISION/GROUP SUPERVISOR**
- **BRANCH DIRECTOR**
- **AIR TACTICAL GROUP SUPERVISOR**

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- Assist other agencies.

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- Order all medical supplies through Logistics.
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### PREPARED BY (RESOURCES UNIT)

- **D. Payton**

### APPROVED BY (PLANNING SECTION CHIEF)

- **T. McClimens**

Date: 6/25/98
**ASSIGNMENT LIST**

1. **BRANCH**
2. **DIVISION/GROUP**
   - Haz Mat
3. **INCIDENT NAME**
   - East IC
   - Hurricane Inc.
4. **OPERATIONAL PERIOD**
   - First
   - DATE: 6/25/98
5. **OPERATIONS PERSONNEL**
   - OPERATIONS CHIEF: Ted Korgenski
   - BRANCH DIRECTOR
   - DIVISION/GROUP SUPERVISOR
   - AIR TACTICAL GROUP SUPERVISOR
6. **RESOURCES ASSIGNED THIS PERIOD**
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11. **APPROVED BY (PLANNING SECTION CHIEF)**
    - T. McClimens
    - DATE: 6/25/98
    - TIME
CENTRAL CITY
TORNADO INCIDENT
6-23-98

(SAMPLE INCIDENT ACTION PLAN)
**OBJECTIVES**

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<td>Tornado incident</td>
<td>6/23/98</td>
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4. OPERATIONAL PERIOD (DATE/TIME)

First operational period 1400 hrs. --6-22-98-- to 0800 6/23/98

5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)

- Provide for the life safety of the public & responders.
- Provide for the mitigation of life-threatening hazards.
- Provide for the protection of the environment.
- Provide for the conservation of property.

6. OBJECTIVES FOR THIS OPERATIONAL PERIOD:

- Ensure safety of the public and responders.
- Prioritize all requests for service.
- Provide initial EMS care.
- Prevent conflagration by holding fires to building of origin.
- Ensure availability of firefighting water.
- Mitigate, stabilize, or isolate hazards that could cause injury/damage.
- Stay visible to public & provide assistance & reassurance.
- Provide assistance to other agencies.

7. WEATHER FORECAST FOR OPERATIONAL PERIOD

Moderate to heavy rain until 2100 hrs. Then reduced to light showers through the night. Day light temp at 65ºF dripping to 45ºF at night. Winds from the s/w at 20 mph. Reduced to 5 to 10 mph after dark.

8. GENERAL SAFETY MESSAGE

- Response routes may have energized lines & debris obstructions.
- Be observant for hazardous materials released in the area.
- Watch for utility hazards (electric, gas, water).
- Slow down & think before you act.

9. ATTACHMENTS (✓ IF ATTACHED)

- [ ] ORGANIZATION LIST (ICS 203)
- [ ] MEDICAL PLAN (ICS 206)
- [ ] ASSIGNMENT LIST (ICS 204)
- [ ] INCIDENT MAP
- [ ] COMMUNICATIONS PLAN (ICS 205)
- [ ] TRAFFIC PLAN

10. PREPARED BY

(Planning Section Chief)

ED DEC Delpdelp

11. APPROVED BY

(Incident Commander)

R. S. Allen

B-23 (Module 3)
## ORGANIZATION ASSIGNMENT LIST

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<th>POSITION</th>
<th>NAME</th>
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NFES 1327
**ASSIGNMENT LIST**

1. **BRANCH**
   - North

2. **DIVISION/GROUP ASSIGNMENT LIST**

3. **INCIDENT NAME**
   - Tornado Inc.

4. **OPERATIONAL PERIOD**
   - **First**
     - **DATE**
     - 6/23/98
     - **TIME**

5. **OPERATIONS PERSONNEL**
   - **OPERATIONS CHIEF**
     - Rod Neufeld
   - **DIVISION/GROUP SUPERVISOR**
   - **BRANCH DIRECTOR**
     - Floyd Lecuyer
   - **AIR TACTICAL GROUP SUPERVISOR**

6. **RESOURCES ASSIGNED THIS PERIOD**

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<th>STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR</th>
<th>LEADER</th>
<th>NUMBER PERSONS</th>
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7. **CONTROL OPERATIONS**
   - Prioritize all requests for service.
   - Provide initial EMS.
   - Prevent conflagration—hold fires to building of origin.
   - Ensure availability of firefighting water.
   - Mitigate or isolate hazards that could cause injury or additional damage.
   - Stay visible to public & provide assistance & reassurance.

8. **SPECIAL INSTRUCTIONS**
   - Keep Branch Director advised of availability of resources & need for additional/specialized resources.

9. **DIVISION/GROUP COMMUNICATIONS SUMMARY**

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10. **PREPARED BY (RESOURCES UNIT)**
    - Dan Dickerson

11. **APPROVED BY (PLANNING SECTION CHIEF)**
    - Eddie Delp
    - **DATE** 6/23/98
    - **TIME**
1. BRANCH  
   Central

2. DIVISION/GROUP

3. INCIDENT NAME  
   Tornado Inc.

4. OPERATIONAL PERIOD  
   First
   DATE  
   6/23/98
   TIME  

5. OPERATIONS PERSONNEL
   OPERATIONS CHIEF  
   Rod Neufeld
   DIVISION/GROUP SUPERVISOR
   BRANCH DIRECTOR  
   Tom O'Neal
   AIR TACTICAL GROUP SUPERVISOR

6. RESOURCES ASSIGNED THIS PERIOD

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<tr>
<th>STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR</th>
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10. PREPARED BY (RESOURCES UNIT)  
   Dan Dickerson

11. APPROVED BY (PLANNING SECTION CHIEF)  
   Eddie Delp
   DATE  
   6/23/98
1. BRANCH
   South

2. DIVISION/GROUP

3. INCIDENT NAME
   Tornado Inc.

4. OPERATIONAL PERIOD
   First
   DATE  6/23/98
   TIME

5. OPERATIONS PERSONNEL
   OPERATIONS CHIEF  Rod Neufeld
   BRANCH DIRECTOR  Mel Tomes

6. RESOURCES ASSIGNED THIS PERIOD

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7. CONTROL OPERATIONS
   - Prioritize all requests for service.
   - Provide initial EMS.
   - Prevent conflagration—hold fires to building of origin.
   - Ensure availability of firefighting water.
   - Mitigate or isolate hazards that could cause injury or additional damage.
   - Stay visible to public & provide assistance & reassurance.

8. SPECIAL INSTRUCTIONS
   - Keep Branch Director advised of availability of resources & need for additional/specialized resources.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

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10. PREPARED BY (RESOURCES UNIT)
    Dan Dickerson

11. APPROVED BY (PLANNING SECTION CHIEF)
    Ed Delp
    DATE  6/23/98
    TIME
**1. BRANCH**

EMS

**2. DIVISION/GROUP**

EMS

**3. INCIDENT NAME**

Tornado Inc.

**4. OPERATIONAL PERIOD**

First

**5. OPERATIONS PERSONNEL**

- **OPERATIONS CHIEF**  Rod Neufeld
- **DIVISION/GROUP SUPERVISOR**
- **BRANCH DIRECTOR**
- **AIR TACTICAL GROUP SUPERVISOR**

**6. RESOURCES ASSIGNED THIS PERIOD**

<table>
<thead>
<tr>
<th>STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR</th>
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</table>

**7. CONTROL OPERATIONS**

- Prioritize emergency medical services to those in need.
- Provide triage of the injured using the START system
- Provide technical assistance on EMS issues to first responders.
- Assist other agencies.

**8. SPECIAL INSTRUCTIONS**

- Order all medical supplies through Logistics.
- Use BLS personnel where appropriate to conserve the use of ALS resources.
- Maintain resources status with chain of command.
- Record incident activity on ICS Form 214.

**9. DIVISION/GROUP COMMUNICATIONS SUMMARY**

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**10. PREPARED BY (RESOURCES UNIT)**

Dan Dickerson

**11. APPROVED BY (PLANNING SECTION CHIEF)**

Ed Delp

**DATE**

6/23/98

**TIME**
### Assignment List

1. **Branch**
   - **USAR**

2. **Division/Group**
   - **USAR**

3. **Incident Name**
   - **Tornado Inc.**

4. **Operational Period**
   - **First**
     - **Date**: 6/23/98
     - **Time**: __________

5. **Operations Personnel**
   - **Operations Chief**: Rod Neufeld
   - **Division/Group Supervisor**: __________
   - **Branch Director**: __________
   - **Air Tactical Group Supervisor**: __________

6. **Resources Assigned This Period**

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7. **Control Operations**

- **Strategic priorities**—Life, Environment, Property, Equipment.
- Provide technical rescue services to those in need.
- Provide technical assistance to first responders.
- Provide assistance to other agencies.

8. **Special Instructions**

- All confined spaces shall be considered IDLH until proven otherwise by atmospheric monitors.
- Use first responders to complete non-technical tasks to conserve on use of USAR specialist resources.
- Maintain resource status with chain of command.
- Record incident activity on ICS Form 214.

9. **Division/Group Communications Summary**

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10. **Prepared By** (Resources Unit)
   - **Dan Dickerson**

11. **Approved By** (Planning Section Chief)
   - **Ed Delp**

12. **Date**
    - 6/23/98
### 1. BRANCH

### 2. DIVISION/GROUP

**Haz Mat**

### ASSIGNMENT LIST

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### 5. OPERATIONS PERSONNEL

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### 6. RESOURCES ASSIGNED THIS PERIOD

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<th>NUMBER PERSONS</th>
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<th>DROP OFF PT/TIME</th>
<th>PICK-UP PT/TIME</th>
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</table>

### 7. CONTROL OPERATIONS

- **Strategic priorities**—protect Life, Environment, Property, Equipment.
- **Containment of all actual or threatened hazardous substance releases.**
- **Provide technical assistance to first responders.**
- **Provide assistance to other agencies.**

### 8. SPECIAL INSTRUCTIONS

- **Use FRO-level personnel where appropriate to conserve on use of haz mat specialist personnel**
- **All haz mat incidents shall be managed using the standardized tactical approach.**
- **Maintain resource status with chain of command.**
- **Record incident activity on ICS Form 214.**

### 9. DIVISION/GROUP COMMUNICATIONS SUMMARY

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>FREQ.</th>
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### 10. PREPARED BY (RESOURCES UNIT)

**Dan Dickerson**

### 11. APPROVED BY (PLANNING SECTION CHIEF)

**Ed Delp**

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### 6. TRANSPORTATION

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<th>PARAMEDICS</th>
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<td>F &amp; 7th Fisherville</td>
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<td>Bay Port Amb.</td>
<td>Ferry &amp; 7th Bay Port</td>
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<td>M &amp; 1st-Harvest Junction</td>
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<td>L &amp; 18th Kingston</td>
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**B. INCIDENT AMBULANCES**

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### 8. MEDICAL EMERGENCY PROCEDURES

- If incident personnel have minor injuries contact Logistics for medical unit assistance.
- Major medical emergencies for incident personnel shall contact dispatch on command channel.

### 9. PREPARED BY (MEDICAL UNIT LEADER)

| Dave Evans |

### 10. REVIEWED BY (SAFETY OFFICER)

| John Madric |

206 ICS 8-78
CENTRAL CITY

EARTHQUAKE INCIDENT

6-24-98

(SAMPLE INCIDENT ACTION PLAN)
### OBJECTIVES

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<tr>
<th>1. INCIDENT NAME</th>
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### 4. OPERATIONAL PERIOD (DATE/TIME)

First period

### 5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)

- Provide for life safety of both the public & responders.
- Provide for protection of environment.
- Protect & minimize damage to property & equipment.

### 6. OBJECTIVES FOR THIS OPERATIONAL PERIOD:

- Ensure safety of the public & responders.
- Prioritize all requests for service.
- Provide initial EMS care.
- Prevent conflagration—hold fires to building of origin.
- Ensure availability of firefighting water.
- Mitigate, stabilize, or isolate all hazards that could injure.
- Stay visible to the public as much as possible & assist.
- Provide assistance to other agencies.

### 10. WEATHER FORECAST FOR OPERATIONAL PERIOD


### 10. GENERAL SAFETY MESSAGE

- Response routes may have many road hazards.
- Watch for haz mat releases.
- Factor in major aftershocks in all decisions.
- Use caution when crossing under/over all bridges.
- Watch for utility hazards (gas, electric, water).
- Slow down & think before you act.

### 9. ATTACHMENTS (√ IF ATTACHED)

- [ ] ORGANIZATION LIST (ICS 203)
- [ ] MEDICAL PLAN (ICS 206)
- [ ] ASSIGNMENT LIST (ICS 204)
- [ ] INCIDENT MAP
- [ ] COMMUNICATIONS PLAN (ICS 205)
- [ ] TRAFFIC PLAN

### ICS 202

10. PREPARED BY (Planning Section Chief)

Ted Korgenski

11. APPROVED BY (Incident Commander)

Dan Dickerson
### ORGANIZATION ASSIGNMENT LIST

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**PREPARED BY (RESOURCES UNIT)**

203 ICS 1-82

NFES 1327

**B-36 (Module 3)**
## MEDICAL PLAN

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<tr>
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<th>2. DATE PREPARED</th>
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### 6. TRANSPORTATION

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### 8. MEDICAL EMERGENCY PROCEDURES

- If incident personnel have minor injuries contact Logistics for medical unit assistance.
- Major medical emergencies for incident personnel shall contact dispatch on command channel.

10. PREPARED BY (MEDICAL UNIT LEADER)

Jim Parker

10. REVIEWED BY (SAFETY OFFICER)

Ed Delp-West, Neufeld-East
1. BRANCH | West
2. DIVISION/GROUP | ASSIGNMENT LIST
3. INCIDENT NAME | Earthquake Inc.
4. OPERATIONAL PERIOD | First
   DATE | 6/24/98
5. OPERATIONS PERSONNEL
   OPERATIONS CHIEF | Ed Fitzgerald
   BRANCH DIRECTOR | Bill Becker
6. RESOURCES ASSIGNED THIS PERIOD

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<th>DROP OFF PT/TIME</th>
<th>PICK-UP PT/TIME</th>
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7. CONTROL OPERATIONS

- Perform company, site & jurisdictional survey's.
- Mitigate life threatening hazards.
- Respond as directed by Branch Director.
- Provide initial EMS.
- Hold fires to building of origin.
- Ensure availability of firefighting water.

8. SPECIAL INSTRUCTIONS

- Factor in major aftershocks in all decisions.
- Use caution when crossing under/over bridges.
- Watch for utility hazards (Gas, Electric, Water).
- Watch for haz mat releases.
- Inform branch of need/availability of resources.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

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10. PREPARED BY (RESOURCES UNIT) | Ted Korgenski
11. APPROVED BY (PLANNING SECTION CHIEF) | Ted Korgenski
   DATE | 6/24/98
   TIME |
1. BRANCH
2. DIVISION/GROUP
   USAR

3. INCIDENT NAME
   Earthquake Inc.

4. OPERATIONAL PERIOD
   First
   DATE: 6/24/98

5. OPERATIONS PERSONNEL
   OPERATIONS CHIEF: Ed Fitzgerald
   DIVISION/GROUP SUPERVISOR: 
   BRANCH DIRECTOR: 
   AIR TACTICAL GROUP SUPERVISOR: 

6. RESOURCES ASSIGNED THIS PERIOD

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</table>

7. CONTROL OPERATIONS
   - Strategic priorities--Life, Environment, Property, Equipment.
   - Provide technical rescue services to those in need.
   - Provide technical assistance to first responders.
   - Provide assistance to other agencies.

8. SPECIAL INSTRUCTIONS
   - All confined spaces shall be considered IDLH until proven otherwise by atmospheric monitors.
   - Use first responders to complete non-technical tasks to conserve on use of USAR specialist resources.
   - Maintain resource status with chain of command.
   - Record incident activity on ICS Form 214.
   - Inform branch of need/availability of resources.

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10. PREPARED BY (RESOURCES UNIT)

11. APPROVED BY (PLANNING SECTION CHIEF)
   DATE: 6/24/98
   TIME: 

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B-39 (Module 3)
1. BRANCH
2. DIVISION/GROUP

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7. CONTROL OPERATIONS

- Strategic priorities—protect Life, Environment, Property, Equipment.
- Containment of all actual or threatened hazardous substance releases.
- Provide technical assistance to first responders.
- Provide assistance to other agencies.

8. SPECIAL INSTRUCTIONS

- Use FRO level personnel where appropriate to conserve on use of haz mat specialist personnel.
- All haz mat incidents shall be managed using the standardized tactical approach.
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**COTC Operations**

**Assignment List**

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<table>
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<tr>
<td>OPERATIONS CHIEF</td>
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<tr>
<td>DIVISION/GROUP SUPERVISOR</td>
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<tr>
<td>BRANCH DIRECTOR</td>
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<tr>
<td>AIR TACTICAL GROUP SUPERVISOR</td>
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<table>
<thead>
<tr>
<th>7. CONTROL OPERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Provide emergency medical services to those in need.</em></td>
</tr>
<tr>
<td><em>Provide triage of the injured using the START system.</em></td>
</tr>
<tr>
<td><em>Provide technical assistance on EMS issues to first responders.</em></td>
</tr>
<tr>
<td><em>Assist other agencies.</em></td>
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</table>

<table>
<thead>
<tr>
<th>8. SPECIAL INSTRUCTIONS</th>
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</thead>
<tbody>
<tr>
<td><em>Order all medical supplies through Logistics.</em></td>
</tr>
<tr>
<td><em>Use BLS personnel where appropriate to conserve the use of ALS resources.</em></td>
</tr>
<tr>
<td><em>Maintain resource status with chain of command.</em></td>
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<tr>
<td><em>Record incident activity on ICS Form 214.</em></td>
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<th>9. DIVISION/GROUP COMMUNICATIONS SUMMARY</th>
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# Medical Plan

**1. Incident Name**

**2. Date Prepared**

**3. Time Prepared**

**4. Operational Period**

**5. Incident Medical Aid Stations**

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<th>Paramedics</th>
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<tr>
<td>Bay Port Amb.</td>
<td>Ferry &amp; 7th Bay Port</td>
<td>1 of 2</td>
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<tr>
<td>Harvest Junction Amb.</td>
<td>M &amp; 1st-Harvest Junction</td>
<td>1 of 3</td>
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<tr>
<td>Kingston</td>
<td>L &amp; 18th Kingston</td>
<td>1 of 3</td>
</tr>
<tr>
<td>Central City EMS</td>
<td>10 Fire Stations</td>
<td>5 of 10</td>
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**6. Transportation**

**A. Ambulance Services**

<table>
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<tr>
<th>Name</th>
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<th>Phone</th>
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<tr>
<td>Central City EMS</td>
<td>10 Fire Stations</td>
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**B. Incident Ambulances**

<table>
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<td>Med-Flight 1</td>
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<td>Central City EMS</td>
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</tbody>
</table>

**8. Medical Emergency Procedures**

- If incident personnel have minor injuries contact Logistics for medical unit assistance.

- Major medical emergencies for incident personnel shall contact dispatch on command channel.

---

**Prepared By (Medical Unit Leader):** Terry Mcclimens  
**Reviewed By (Safety Officer):** Darryl Payton
# COTC Operations

## Assignment List

1. **Branch**: East
2. **Division/Group**: 
3. **Incident Name**: Earthquake Inc.
4. **Operational Period**: First
   - **Date**: 6/24/98
   - **Time**: ______

### Operations Personnel

- **Operations Chief**: Ed Fitzgerald
- **Branch Director**: Ben Hudgens

### Resources Assigned This Period

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### Control Operations

- Perform company site & jurisdictional survey’s.
- Mitigate life threatening hazards.
- Respond as directed by Branch Director.
- Provide initial EMS.
- Hold fires to building of origin.
- Ensure availability of firefighting water.

### Special Instructions

- Factor in major aftershocks in all decisions.
- Use caution when crossing under/over bridges.
- Watch for utility hazards (Gas, Electric, Water).
- Watch for haz mat releases.
- Inform branch of need/availability or resources.

### Division/Group Communications Summary

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</table>

### Prepared By (Resources Unit)

Ted Korgenski

### Approved By (Planning Section Chief)

Ted Korgenski

**Date**: 6/24/98

**Time**: ______
CENTRAL CITY

TERRORIST INCIDENT

6-23-98

(SAMPLE INCIDENT ACTION PLAN)
# OBJECTIVES

<table>
<thead>
<tr>
<th>1. INCIDENT NAME</th>
<th>2. DATE PREPARED</th>
<th>3. TIME PREPARED</th>
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<tbody>
<tr>
<td>Terrorist Inc.</td>
<td>6/23/98</td>
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</table>

## 4. OPERATIONAL PERIOD (DATE/TIME)

*First Period*

## 5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)

- Provide for the life safety of the responders & public.
- Stabilize the incident.
- Protect the environment.
- Preserve the crime scene, limit damage to property/equipment.

## 6. OBJECTIVES FOR THIS OPERATIONAL PERIOD:

- Ensure safety of the responders and public.
- Prioritize all requests for service.
- Provide initial EMS care.
- Prevent conflagration--hold fires to floor/building of origin.
- Mitigate, stabilize, isolate all hazards that could lead to injury.
- Protect & preserve evidence & the crime scene.

## 7. WEATHER FORECAST FOR OPERATIONAL PERIOD

## 8. GENERAL SAFETY MESSAGE

- All personnel shall wear appropriate level of PPE while in the operational area.
- Watch for symptoms of exposure to NBC agents (flu-like symptoms) in responders, if noted, remove from area & advise chain of command.

## 9. ATTACHMENTS (✓ IF ATTACHED)

- [ ] ORGANIZATION LIST (ICS 203)
- [ ] MEDICAL PLAN (ICS 206)
- [ ] ASSIGNMENT LIST (ICS 204)
- [ ] INCIDENT MAP
- [ ] COMMUNICATIONS PLAN (ICS 205)
- [ ] TRAFFIC PLAN

## 10. PREPARED BY

Tom Conners

## 12. APPROVED BY

Dave Bacthis
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</table>
1. BRANCH: Search & Rescue
   Suppression
2. DIVISION/GROUP: Suppression

3. INCIDENT NAME: Terrorist Inc.

4. OPERATIONAL PERIOD: First
   DATE: 6/23/98
   TIME: 

5. OPERATIONS PERSONNEL
   OPERATIONS CHIEF: Lecuyer
   DIVISION/GROUP SUPERVISOR:
   BRANCH DIRECTOR: Delp
   AIR TACTICAL GROUP SUPERVISOR:

6. RESOURCES ASSIGNED THIS PERIOD
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</table>

7. CONTROL OPERATIONS
   - Strategic priorities--Life, Environment, Crime Scene, Property, Equipment.
   - Provide initial EMS then transfer to EMS branch.
   - Protect the victims & the property from further damage by fire.
   - Mitigate, stabilize, isolate all hazards that could lead to injury.
   - Protect & preserve evidence & the crime scene.

8. SPECIAL INSTRUCTIONS
   - Watch for secondary devices.
   - Look for symptoms of exposure to NBC agents (flu-like symptoms).
   - All confined spaces shall be considered IDLH until proven otherwise by atmospheric monitors
   - Maintain resource status with chain-of-command.
   - Record incident activity on ICS Form 214.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY
<table>
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10. PREPARED BY (RESOURCES UNIT): Evans
11. APPROVED BY (PLANNING SECTION CHIEF): Conners
   DATE: 6/23/98
   TIME: 

B-49 (Module 3)
1. BRANCH S & R Suppression
2. DIVISION/GROUP USAR

3. INCIDENT NAME Terrorist Inc.
4. OPERATIONAL PERIOD First
   DATE 6/23/98
   TIME

5. OPERATIONS PERSONNEL
   OPERATIONS CHIEF Lecuyer
   BRANCH DIRECTOR Delp

6. RESOURCES ASSIGNED THIS PERIOD

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<thead>
<tr>
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</table>

7. CONTROL OPERATIONS
   - Strategic priorities--Life, Environment, Property, Equipment.
   - Provide technical rescue services to those in need.
   - Provide technical assistance to first responders.
   - Provide assistance to other agencies.

8. SPECIAL INSTRUCTIONS
   - All confined spaces shall be considered IDLH until proven otherwise by atmospheric monitors.
   - Use first responders to complete non-technical task to conserve on use of USAR specialist resources.
   - Maintain resource status with chain of command.
   - Record incident activity on ICS Form 214.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

<table>
<thead>
<tr>
<th>FUNCTION</th>
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10. PREPARED BY (RESOURCES UNIT) Evans
11. APPROVED BY (PLANNING SECTION CHIEF) Conners
   DATE 6/23/98
   TIME
1. BRANCH  
**Search & Rescue Suppression**

2. DIVISION/GROUP  
**Haz Mat**

### ASSIGNMENT LIST

3. INCIDENT NAME  
**Terrorist Inc.**

4. OPERATIONAL PERIOD  
**First**

<table>
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5. OPERATIONS PERSONNEL

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<tr>
<th>OPERATIONS CHIEF</th>
<th>DIVISION/GROUP SUPERVISOR</th>
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<tbody>
<tr>
<td>Lecuyer</td>
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</table>

<table>
<thead>
<tr>
<th>BRANCH DIRECTOR</th>
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<tbody>
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6. RESOURCES ASSIGNED THIS PERIOD

<table>
<thead>
<tr>
<th>STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR</th>
<th>LEADER</th>
<th>NUMBER PERSONS</th>
<th>TRANS. NEEDED</th>
<th>DROP OFF PT/TIME</th>
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</tbody>
</table>

7. CONTROL OPERATIONS

- Strategic priorities—protect Life, Environment, Property, Equipment.
- Containment of all actual or threatened hazardous substance releases.
- Provide technical assistance to first responders.
- Provide assistance to other agencies.

8. SPECIAL INSTRUCTIONS

- Use FRO-level personnel where appropriate to conserve on use of haz mat specialist personnel.
- All haz mat incidents shall be managed using the standardized tactical approach.
- Maintain resource status with chain of command.
- Record incident activity on ICS Form 214.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>FREQ.</th>
<th>SYSTEM</th>
<th>CHAN.</th>
<th>FUNCTION</th>
<th>FREQ.</th>
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<tr>
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10. PREPARED BY (RESOURCES UNIT)  
**Evans**

11. APPROVED BY (PLANNING SECTION CHIEF)  
**Conners**

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/23/98</td>
<td></td>
</tr>
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</table>
1. BRANCH
EMS

2. DIVISION/GROUP
Treatment

3. INCIDENT NAME
Terrorist Inc.

4. OPERATIONAL PERIOD
First

   DATE   6/23/98
   TIME

5. OPERATIONS PERSONNEL

   OPERATIONS CHIEF    Lecuyer
   BRANCH DIRECTOR     McClimens

6. RESOURCES ASSIGNED THIS PERIOD

   STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR
   LEADER
   NUMBER PERSONS
   TRANS. NEEDED
   DROP OFF PT/TIME
   PICK-UP PT/TIME

7. CONTROL OPERATIONS

   - Provide emergency medical services to those in need.
   - Provide triage of the injured using the START system.
   - Provide technical assistance on EMS issues to first responders.
   - Assist other agencies.

8. SPECIAL INSTRUCTIONS

   - Order all medical supplies through Logistics.
   - Use BLS personnel where appropriate to conserve the use of ALS resources.
   - Maintain resource status with chain of command.
   - Record incident activity on ICS Form 214.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>FREQ.</th>
<th>SYSTEM</th>
<th>CHAN.</th>
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<tr>
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<td>DIV/GROUP TACTICAL</td>
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<td>GROUND-TO-AIR</td>
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</table>

10. PREPARED BY (RESOURCES UNIT)  Evans
11. APPROVED BY (PLANNING SECTION CHIEF)  Conners
   DATE  6/23/98
   TIME
### ASSIGNMENT LIST

**1. BRANCH**
- EMS

**2. DIVISION/GROUP**
- Transportation

**3. INCIDENT NAME**
- Terrorist Inc.

**4. OPERATIONAL PERIOD**
- **First**
  - DATE: 6/23/98

**5. OPERATIONS PERSONNEL**

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations Chief</td>
<td>Lecuyer</td>
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<tr>
<td>Division/Group Supervisor</td>
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</tr>
<tr>
<td>Branch Director</td>
<td>McClimens</td>
</tr>
<tr>
<td>Air Tactical Group Supervisor</td>
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**6. RESOURCES ASSIGNED THIS PERIOD**

<table>
<thead>
<tr>
<th>Strike Team/Task Force Resource Designator</th>
<th>Leader</th>
<th>Number Persons</th>
<th>Trans. Needed</th>
<th>Drop Off Pt/Time</th>
<th>Pick-Up Pt/Time</th>
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</table>

**7. CONTROL OPERATIONS**
- Provide emergency medical services to those in need.
- Provide triage of the injured using the START system.
- Provide technical assistance on EMS issues to first responders.
- Assist to other agencies.

**8. SPECIAL INSTRUCTIONS**
- Order all medical supplies through Logistics.
- Use BLS personnel where appropriate to conserve on use of ALS resources.
- Maintain resource status with chain of command.
- Record incident activity on ICS Form 214.

**9. DIVISION/GROUP COMMUNICATIONS SUMMARY**

<table>
<thead>
<tr>
<th>Function</th>
<th>Freq.</th>
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<td>Support</td>
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<td>REPEAT</td>
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<tr>
<td>DIV/GROUP Tactical</td>
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**10. PREPARED BY (RESOURCES UNIT)**
- Evans

**11. APPROVED BY (PLANNING SECTION CHIEF)**
- Conners
  - DATE: 6/23/98
  - TIME: 11:00 AM
1. BRANCH Evac/Exposure
2. DIVISION/GROUP Exposure
3. INCIDENT NAME Terrorist Inc.
4. OPERATIONAL PERIOD First
   DATE 6/23/98
   TIME

5. OPERATIONS PERSONNEL
   OPERATIONS CHIEF Lecuyer
   BRANCH DIRECTOR Payton
   DIVISION/GROUP SUPERVISOR
   AIR TACTICAL GROUP SUPERVISOR

6. RESOURCES ASSIGNED THIS PERIOD
<table>
<thead>
<tr>
<th>STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR</th>
<th>LEADER</th>
<th>NUMBER PERSONS</th>
<th>TRANS. NEEDED</th>
<th>DROP OFF PT/TIME</th>
<th>PICK-UP PT/TIME</th>
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</tbody>
</table>

7. CONTROL OPERATIONS
   - Strategic priorities--Life, Environment, Crime Scene, Property, Equipment.
   - Hold fires to building of origin.
   - Mitigate, stabilize, isolate hazards that could cause injury.
   - Preserve evidence & the crime scene.

8. SPECIAL INSTRUCTIONS
   - Request additional/specialized resources as needed.
   - Maintain resources status with chain-of-command.
   - Record incident activity on ICS Form 214.
   - Keep eyes open for secondary device.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY
<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>FREQ.</th>
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10. PREPARED BY (RESOURCES UNIT) Evans
11. APPROVED BY (PLANNING SECTION CHIEF) Conners
   DATE 6/23/98
   TIME
1. BRANCH
Evac/Exposure
2. DIVISION/GROUP
Evacuation

ASSIGNMENT LIST

3. INCIDENT NAME
Terrorist Inc.

4. OPERATIONAL PERIOD
First
DATE
6/23/98
TIME

5. OPERATIONS PERSONNEL

OPERATIONS CHIEF
Lecuyer
DIVISION/GROUP SUPERVISOR

BRANCH DIRECTOR
Payton
AIR TACTICAL GROUP SUPERVISOR

6. RESOURCES ASSIGNED THIS PERIOD

<table>
<thead>
<tr>
<th>STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR</th>
<th>LEADER</th>
<th>NUMBER PERSONS</th>
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<th>PICK-UP PT/TIME</th>
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</tbody>
</table>

7. CONTROL OPERATIONS

- Evacuation/Evaluation inside hot zone will be handled by fire department personnel.
- Evacuation/Evaluation outside hot zone will be handled by PD
- Provide first aid to minor injuries.
- Injuries requiring transport to hospital--move to EMS Branch

8. SPECIAL INSTRUCTIONS

- Ensure safety of the responders & the public.
- Where safe to do so, use volunteers to conserve resources.
- Maintain resource status with chain-of-command.
- Record incident activities on ICS Form 214.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>FREQ.</th>
<th>SYSTEM</th>
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10. PREPARED BY (RESOURCES UNIT)
Evans

11. APPROVED BY (PLANNING SECTION CHIEF)
Conners

DATE
6/23/98
TIME
# Medical Plan

## 1. Incident Name

## 2. Date Prepared

## 3. Time Prepared

## 4. Operational Period

## 5. Incident Medical Aid Stations

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<tr>
<th>Medical Aid Stations</th>
<th>Location</th>
<th>Paramedics</th>
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## 6. Transportation

### A. Ambulance Services

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<tr>
<th>Name</th>
<th>Address</th>
<th>Phone</th>
<th>Paramedics</th>
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<tbody>
<tr>
<td>Fisherville Amb.</td>
<td>F &amp; 7th Fisherville</td>
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</tr>
<tr>
<td>Bay Port Amb.</td>
<td>Ferry &amp; 7th Bay Port</td>
<td></td>
<td>1 of 2</td>
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<tr>
<td>Harvest Junction Amb.</td>
<td>M &amp; 1st-Harvest Junction</td>
<td></td>
<td>1 of 3</td>
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<tr>
<td>Kingston</td>
<td>L &amp; 18th Kingston</td>
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<td>1 of 3</td>
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<tr>
<td>Central City EMS</td>
<td>10 Fire Stations</td>
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### B. Incident Ambulances

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<th>Name</th>
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<tr>
<td>Med-Flight 1</td>
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<td>Flight for Life</td>
<td>St. Dorthy's Hospital Monroe Dr.</td>
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<td>Central City EMS</td>
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## 7. Hospitals

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<tr>
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<tr>
<td>Central City Hospital.</td>
<td>D &amp; 31st</td>
<td>374-1501</td>
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<td>Faith Hospital.</td>
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<td>Columbia Veterans</td>
<td>J &amp; 7th</td>
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<td>3</td>
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</tbody>
</table>

## 8. Medical Emergency Procedures

- If incident personnel have minor injuries contact Logistics for medical unit assistance.

- Major medical emergencies for incident personnel shall contact dispatch on command channel.

**Prepared by:** Hawkins  
**Reviewed by:** Koenig

ICS 8-78  
B-56 (Module 3)
MODULE 4

SLIDES
Chief Officer Training Curriculum
Operations Module 4: ICS for EMS

Objectives
- Identify positions and responsibilities in the ICS organization for EMS incidents
- Identify elements of S.T.A.R.T.
- Identify potential problems for an EMS incident
- Identify resource needs at EMS incidents
- Develop a command and organizational structure at an EMS incident

Overview
- Who is in charge at EMS incidents?
- Roles and responsibilities of the IC, division/group leaders, and unit leaders
- S.T.A.R.T. system
- Basic and expanded ICS organization for EMS incidents
- Multicasualty ICS branch at EMS incidents
Benefits of an ICS at EMS Incidents

- Controls, organizes, and directs responders
- Provides common terminology and position titles
- Provides chain of command
- Groups common functions and responsibilities

Benefits of an ICS at EMS Incidents (continued)

- Provides for responder accountability and safety
- Provides for accurate patient accountability and structure to deliver appropriate care
- Provides for efficient use of regional resources (hospitals, transports, trauma centers, etc.)

Levels of EMS Incidents

- Often defined by local guidelines
- Multiple casualty incident:
  - May have minimal number of casualties but unusual events
  - May hinder normal operations at local hospitals
  - May draw down system resources, or number of patients outnumbers resources or rescuers
WHO IS IN CHARGE AT EMS INCIDENTS?

Role and Responsibilities of the IC

♦ Ensures life safety of responders and citizens
♦ Determines objectives and strategies, sets immediate priorities
♦ Determines/approves tactical objectives
♦ Establishes an Incident Command Post (ICP)

Role and Responsibilities of the IC (continued)

♦ Coordinates activities of assigned staff
♦ Authorizes release of information to the news media
♦ Establishes an ICS organization to meet incident needs, both current and projected
Initial Response Basic Organization

- Incident Commander

Rescue/Extrication Group Supervisor

- Incident Commander
- Rescue/Extrication Group

Rescue/Extrication Group Supervisor (continued)

- Implements assigned incident objectives
- Provides tactical direction and supervision to assigned resources
- Determines resources needed to extricate patients
- Communicates resource requirements to IC as necessary
- Ensures safety of members operating in area
Rescue/Extrication Group Supervisor (continued)

- Coordinates with treatment unit leader for patient care during rescue operation
- Ensures efficacy of rescue/extrication operations
- Coordinates patient transportation to triage area
- Provides frequent progress reports to IC
- Maintains incident documentation

Medical Group Supervisor

- Implements assigned incident objectives
- Participates in multicasualty branch/operations section planning
- Establishes medical group/division
- Requests additional personnel and resources
- Designates unit leaders and treatment areas
Medical Group Supervisor (continued)

- Isolates morgue and minor treatment from immediate and delayed treatment areas
- Requests law enforcement/coroner involvement
- Establishes communication and coordination with transportation
- Ensures activation of hospital alert system

Medical Group Supervisor (continued)

- Directs on-scene personnel such as Red Cross, coroner, medical teams
- Ensures safety and security of treatment and morgue areas
- Directs medically trained personnel to appropriate unit leader
- Maintains incident documentation

Triage Unit Leader

[Diagram of incident command structure]
Triage Unit Leader (continued)

- Determines location of triage area(s)
- Ensures all patients assessed and sorted in accordance with appropriate triage protocols
- Determines resources required for triage operations

Triage Unit Leader (continued)

- Communicates resource requirements to medical group supervisor as necessary
- Develops triage organization sufficient to handle assignment
- Ensures safety and security of all members operating in area
- Ensures efficacy of triage operations

Triage Unit Leader (continued)

- Provides frequent progress reports to medical group supervisor
- Establishes initial morgue operations
- Coordinates movement of patients from triage area to treatment area
- Maintains incident documentation
S.T.A.R.T.

- Uses vital signs instead of mechanism of injury
- Takes less medical expertise
- Uses basic vital signs
- Uses standard triage tags

Triage Tags

S.T.A.R.T. (continued)

Algorithm
- Assess ventilation
- Assess perfusion
- Assess mental status
Treatment Unit Leader

- Identifies and establishes suitable area(s) for treatment operations
- Identifies and requests additional resources as needed
- Coordinates with triage unit leader the movement of patients from the triage area to treatment area(s)
- Receives patients in the treatment area

Treatment Unit Leader (continued)

- Establishes communication and coordination with patient transportation group supervisor
- Assigns, supervises, and coordinates personnel within the area(s)
- Ensures safety of members operating in area
Treatment Unit Leader (continued)

- Ensures efficacy of treatment operations
- Directs movement of patients to ambulance loading area
- Provides frequent progress reports to the medical group supervisor
- Maintains incident documentation

Transportation Group Supervisor

- Establishes adequately sized, easily identifiable patient loading area
- Establishes communication with area hospitals
- Designates ambulance staging area
- Identifies and requests additional resources
Transportation Group Supervisor (continued)

- Directs transportation of patients in coordination with treatment unit leader
- Requests air and ground ambulance
- Coordinates air ambulance transportation
- Establishes air ambulance helispot(s)
- Maintains patient tracking records

Basic Organization
Staging Area Manager

Assembles, coordinates, and controls resources assigned to staging
- Ensures unimpeded access to and egress from staging area
- Establishes an accurate inventory system for all responding units
- Provides routing instructions for resource assignments

Staging Area Manager (continued)

- Requests maintenance services for staged resources as needed
- Safeguards staging
- Determines required reserve level(s) for assigned resources
- Advises operations section chief when resource at or near minimum reserve level
Staging Area Manager (continued)

- Coordinates access to EMS vehicles with ground ambulance coordinator
- Ensures safety of members operating in the staging area
- Evaluates staging area operations for efficacy
- Provides frequent progress reports

Helibase Manager

- Locates safe and adequately sized Landing Zone (L/Z)
- Advises command and the transportation officer of L/Z location
- Ensures L/Z site safety
- Maintains communications with helicopters

Helibase Manager (continued)

- Secures safe routes for ground ambulances entering and exiting the L/Z
- Requests and supervises resources as needed
- Maintains incident documentation
Treatment Team Managers

- Request and assign resources for patient needs
- Ensure continuous triage of patients in area
- Prioritize patients for transport
- Coordinate and notify treatment dispatch manager of readiness and priority of patients for transport
- Ensure patient information documented

Treatment Dispatch Manager

- Establish and maintain communications with treatment managers and medical communications coordinator
- Verify with treatment managers any special transport needs
- Assure tracking of patient information
Medical Supply Coordinator

- Responsible for procuring, maintaining, and distributing medical supplies
- In fully expanded ICS, communicates with logistics section—supply unit leader

Morgue Manager

- Coordinates activity with law enforcement
- Identifies and secures suitable area for morgue
- Coordinates with medical examiner regarding removal of deceased
- Ensures completion of all documents related to deceased

Morgue Manager (continued)

- Ensures safety of members operating in area
- Communicates progress reports to IC as required
- Keeps identity of deceased confidential
- Maintains appropriated incident documentation
Medical Communications Coordinator (continued)

- Establish and maintain communications with medical facilities or local medical resource control point
- Maintain current status of medical facility availability
- Coordinate with treatment dispatch manager and ambulance coordinators
- Coordinate off-incident patient destinations
- Maintain appropriate incident documents

Air/Ground Ambulance Coordinators

- Establish ambulance staging area and log units in and out as assigned
- Coordinate with helibase manager or air operations branch director
- Establish and maintain communications with medical communications coordinator and treatment dispatch manager
- Provide ambulance resources
Air/Ground Ambulance Coordinators (continued)

- Provide inventory of medical supplies available at ambulance staging area
- Assure necessary equipment available in ambulances
- Establish contact with ambulance agencies at scene
- Request additional resources
- Maintain incident documentation

Activity 4.1: Liberty County Vehicle Accident

Scenario: Basic Information

- TIME: 2000 hours
- DATE: January 20
- WEATHER: 45 degrees, winds from SSE @ 5 to 10 knots, overcast skies
2000 Hours

Liberty communications to:
- Liberty Engine 203
- Central Truck 101
- Liberty Battalion 1
- LifeLine 22
- Liberty County Sheriff’s Units

Reported traffic accident at the intersection of State Route 52 and East Lake. Possible people trapped.

2003 Hours

Able Flight 1 to Liberty Communications:
- Currently over the East Lake accident. Appears to be a minimum of three vehicles. Two vehicles over the side. One appears to be a large vehicle. We will try to get a closer look.

Liberty Battalion 1 to Liberty Communications:
- Copy Able’s traffic—multiple vehicles

2004 Hours

Able Flight 1 to Liberty Communications:
- Confirmed three vehicles. Two over the side. One appears to be a bus. The other two sedans.

Liberty Engine 203 to Liberty Communications:
- Engine 203 on scene; stand by for report on conditions.
2005 Hours

Liberty Engine 203 to Liberty Communications:
- Three vehicles involved. Multiple victims trapped inside an overturned bus which is off the road and down an embankment 25 feet. Appear to be at least 15 victims.
- Assuming Lake Command

LifeLine 22 to Liberty Communications:
- On scene

2007 Hours

Lake Command to Liberty Communications:
- This will be a mass-casualty incident. Triage in progress. Request an MCI response per Liberty County EMS plan.

Liberty Communications to Lake Command:
- Copy MCI response—prepare to copy resources
- Liberty Battalion 1 Copies

2007 Hours (continued)

Central Truck 101 to Liberty Communications:
- On scene

Liberty Battalion 1 to Liberty Communications:
- On scene assuming; Lake Command
### 2008 Hours

Liberty Communications to Lake Command:
- Copy Liberty Battalion 1 now Lake Command
- Stand by to copy the MCI response
- Liberty Chief has been notified and is responding—ETA 20 minutes.

### 2009 Hours

Liberty Communications to Lake Command:
- MCI response and ETA’s are
- Liberty Battalion: 2 to 5 minutes
- Liberty Engine 201: 6 minutes
- Liberty Engine 202: 6 minutes
- Liberty Engine 205: 7 minutes
- Central Truck 102: 8 minutes W/3
- Central Mass-Casualty: 8 minutes W/1

### 2009 Hours (continued)

- Medflight 1: 8 minutes
- Medflight 2: 16 minutes
- LifeLine 21: 5 minutes
- LifeLine 24: 5 minutes
- LifeLine 25: 8 minutes
- Community 31: 6 minutes
- Community 33: 8 minutes
- Community 34: 9 minutes
- Central Medic 101: 7 minutes
- Central Medic 103: 9 minutes
- Central Medic 106: 10 minutes
2010 Hours

Triage to Lake Command:
- There is a total of 30 patients. Triage report is being brought to the Command Post at this time.
- At least 10 patients will require extensive extrication work. At least 2 hours to free all patients.
- The bus appears stable. No fuel leak detected at this time. Second vehicle stable with fuel leak. One DOA.

Module Summary

- Basic ICS organization at EMS incidents
- Expanded ICS organization at ICS incidents
- Multicasualty Branch at EMS incidents
MODULE 4

ICS FOR EMERGENCY MEDICAL SYSTEMS (EMS)
MODULE 4:

ICS FOR EMERGENCY MEDICAL SYSTEMS (EMS)

Objective
Upon completing the module, you will be able to apply the ICS organization to an EMS incident, addressing organizational structure, identifying resource needs, and identifying potential problems.

Methodology
This module uses lecture, discussion, and an activity.

NFPA 1021 Standards Cross-Reference Matrix
3-6, 3-7, 4-6, 4-7
Benefits of an Incident Command System

Emergency responders need to be able to manage multicasualty events effectively. A proven system, the Incident Command System (ICS), is designed to provide the emergency responder with an organization and system to manage these events effectively.

Using the ICS has many benefits. It enables the user to organize, control, and direct responders quickly, eliminating the possibility of freelancing. It allows the Incident Commander (IC) to direct all responders toward a common goal. This organization, control, and direction minimize confusion and chaos.

The ICS also provides for common terminology and position titles. It ensures that there is a communications plan and that radio communications to command team members are controlled. Proper radio designations for all command team members also is assured.

The ICS creates a chain of command that ensures the proper flow of critical communications to the appropriate command team members. This information flow is vital; effective decisions cannot be made without proper and timely information.

The ICS groups common functions and responsibilities within the organization. This grouping assures that related functions are not fragmented and are not competing against one another. For example, all treatment-related functions are grouped under the medical group/division supervisor.

The ICS provides for responder accountability. Personnel will recognize the evolution of the system to fit the emergency. They will know the chain of command and how to communicate decision-making information. They will be informed on how to request the resources needed for their areas of responsibility. The system provides a standardized approach to managing mass-casualty incidents.
The ICS will be effective only if all responders are trained and know how to use the system. The goal of this course is to provide the training necessary to implement an ICS effectively at emergency medical incidents.

Levels of EMS Incidents

An EMS Incident can range from a single patient to a multicasualty event. Incidents beyond a single patient are often defined in terms established by local guidelines. The definition of a multicasualty incident is not static. It will vary from one community to another and is dependent on the availability of resources. Typically it may be described as an incident that substantially draws down the local resources in the community and has a negative impact on local hospitals.

A small incident, defined as a multicasualty incident, is one that may have produced a minimal number of casualties but is complicated by unusual events such as a hazardous materials spill. A multicasualty incident would require the response of two or more medical units. Local hospitals would be affected by the number of patients, which would disrupt the hospital’s normal operations. This, in turn, would affect a system’s capability to maintain routine operations and adversely affect turnaround time for units at the hospital, thus diminishing the level of available resources for immediate response to routine emergencies and/or back to the incident.

Who is in Charge at EMS Incidents?

All incidents must have a single IC who directs all incident operations no matter how many agencies may respond to the incident. The challenge is to determine who the IC should be. Which agency? Which discipline?

State and local laws and ordinances may define which agency or discipline has the legal responsibility for managing mass-casualty incidents.
Generally, fire departments are given the responsibility to manage fires, mass casualty (when EMS is a component of the agency), hazardous materials, and other non-law-enforcement emergency incidents. If multiple fire departments respond to the incident, command responsibility typically is given to the department in the jurisdiction of the incident. All other fire departments work for that fire department to resolve the incident.

In instances where EMS provision is through a third-service system, the EMS agency may be responsible for management of the multicasualty branch.

Law enforcement agencies generally are responsible for managing all operations related to criminal incidents such as terrorist events, bombings, snipers, or hostage situations. Fire and EMS agencies become subordinate to the police and support their operations.

A single IC must be appointed for an incident unless the incident is to be managed under a unified command.

Pre-incident planning is essential in determining the IC and the process for merging all the possible agencies responding to the incident into the ICS. This planning should produce written agreements reflecting the merger, followed by the necessary training.

Most fire departments have extensive experience in the use of the ICS. Other agencies, such as law enforcement, may not have any experience in the use of the ICS. Because of this, fire departments should take a lead role in assisting other agencies and disciplines in the adoption, training, and implementation of the ICS. Incident operations will not be very effective unless all responders are working within the system.
Role and Responsibilities of the Incident Commander

The person assigned as the IC is responsible for overall incident management. In that role he or she will:

- Initiate a plan by determining objectives and strategies and setting immediate priorities;
- Ensure the life safety of responders and citizens;
- Determine/approve tactical objectives for incident management; and
- Implement the Incident Command Post (ICP) and coordinate activities of assigned staff.

Initial Response Basic Organization

Although the IC has ultimate responsibility for all activities on the incident ground, the IC should delegate tasks for completion to the functional area officers. As was previously explained, the use of the ICS structure permits greater effectiveness and span-of-control.
The modular design of ICS allows the IC to establish ICS positions on an as-needed or projected-need basis. Therefore, organizational development will vary from incident to incident. ICS development should center on maintaining an effective span-of-control in order to meet incident objectives.

For purposes of presentation, the information contained in this and subsequent modules is not presented in a mandated development sequence. The presentation is designed to deliver information regarding specific positions within the ICS multicasualty branch and to illustrate appropriate organizational design. An IC may choose to fill lower level positions first and fill in upper level staff as span-of-control becomes an issue.

Roles and Responsibilities of Division/Group Supervisors and Unit Leaders

**Rescue/Extrication Group Supervisor**

![Figure 4-2: Incident Basic Organization, Part 2](image)

The IC normally establishes the rescue/extrication group position early in the incident. It often is assigned to the first resource in the area. Additional positions would follow as additional resources arrive on the scene. Personnel operating within the extrication area generally perform primary care on
the patients and then coordinate the transport of patients to the triage areas. Often the rescue/extrication group operates within the hazard zone with potential risks to personnel and patients. Appropriate action should be taken to provide safeguards.

Wherever possible, critical patients should be extricated, triaged, and delivered to the treatment area ahead of more stable patients. To accomplish this process, there will have to be some interface with the triage unit leader. Performing triage for critical patients first may not always be possible because some stable patients must be extricated first in order to reach the more critical patients.

The rescue/extrication group supervisor is responsible for managing the rescue of entrapped victims. This responsibility requires the rescue/extrication group supervisor to:

- Coordinate with treatment unit for patient care during the rescue operation;
- Determine resources needed to extricate patients:
  * Rescue tools,
  * Backboards,
  * Personnel, and
  * Relief personnel.
- Implement assigned incident objectives;
- Communicate resource requirements to IC as necessary;
- Provide tactical direction and supervision to assigned resources;
- Ensure safety to members operating in the area;
- Ensure efficacy of rescue/extrication operations;
- Coordinate patient transportation to triage area;
- Provide IC with frequent and timely progress reports; and
- Maintain incident documentation.

**Medical Group/Division Supervisor**

The medical group/division supervisor reports to the multicasualty branch director and supervises the triage unit leader, treatment unit leader, and medical supply coordinator. The medical group/division supervisor establishes command and controls the activities within a medical group/division in order to assure the best possible emergency medical care to patients during a multicasualty incident.

He or she:

- Implements assigned incident objectives;
- Participates in the multicasualty branch/operations section planning activities;
- Establishes the medical group/division with assigned personnel; requests additional personnel and resources sufficient to handle the magnitude of the incident;

- Designates the unit leaders and treatment area locations as appropriate;

- Isolates morgue and minor treatment areas from immediate and delayed treatment areas;

- Requests law enforcement/coroner involvement as needed;

- Determines amount and types of additional medical resources and supplies needed to handle the magnitude of the incident (for example, medical caches, backboards, litters, and cots);

- Establishes communications and coordination with the patient transportation group supervisor;

- Ensures activation of hospital alert system, local EMS/health agencies;

- Directs and/or supervises on scene personnel from agencies such as the coroner’s office, Red Cross, law enforcement, ambulance companies, county health agencies, and hospital volunteers;

- Ensures proper security, traffic control, and access for the medical group/division area;

- Directs medically trained personnel to the appropriate unit leader; and

- Maintains incident documentation.
The triage unit leader is responsible for the triage and tagging of all patients at major incidents. The triage and tagging may take place either in the extrication area or at the entry to the treatment area. In either case, close coordination must be maintained with the treatment unit and extrication group. Personnel assigned to triage must have the basic medical skills to make appropriate triage decisions. The triage unit leader will:

- Determine location of triage areas;
- Ensure that all patients are assessed and sorted in accordance with appropriate triage protocols;
- Determine resources required to conduct triage operations:
  * Communications,
  * Personnel,
  * Equipment and supplies, and
SM 4-12

C O T C
Operations

* Relief units;

• Communicate resource requirements to the medical group supervisor as required;

• Develop triage organization sufficient to handle assignment;

• Ensure safety and security of all members operating in the triage area;

• Ensure efficacy of triage operations;

• Provide frequent progress reports to the medical group supervisor;

• Establish initial morgue operations (as needed);

• Coordinate movement of patients from triage area to treatment area; and

• Maintain incident documentation.

Simple Triage And Rapid Transport (S.T.A.R.T.)
The S.T.A.R.T. system of triage was designed as a method to quickly move through a multicasualty scene and sort the victims for movement to the treatment unit. The system does not use the type of injury to determine the severity of the victim’s condition but rather the victim’s vital signs, regardless of the injuries he or she may have sustained.

It has been found that assessing by simple vital signs takes less medical expertise than assessing by type of injury, and it can be done quickly by rescue workers without the help of advanced medical professionals.

S.T.A.R.T. uses three basic vital signs to make the determination of the victim’s condition (see Figure 4-5: S.T.A.R.T. Algorithm):
• Ventilation,

• Perfusion, and

• Mental status.

Here is how it works. The rescuer, armed with the standard triage tags (red—immediate, yellow—delayed, green—minor, and black—deceased), moves into the area where the victims are found.

The rescuer makes an announcement for everyone who can walk to start moving towards the treatment area. Those victims who respond will usually have stable enough vital signs, mental status, and injuries that they can have a triage tag placed on them indicating they will go to the minor treatment area. The rescuer places the triage tag on them and sends them on their way.

Remember, this system is not a perfect way to sort victims but is only used for quick sorting of the injured in a mass-casualty incident. If, after the victim reaches the minor treatment area, a more extensive evaluation reveals that the victim’s injuries need more immediate care, the victim can be upgraded and moved to the immediate or delayed treatment areas.

Now that the victims with minor injuries have been removed, the rescuer can quickly assess the number of victims remaining. The rescuer moves to the first victim and looks at the victim’s respirations.

**Ventilation**

If the victim is not breathing, the rescuer repositions the airway and checks again. If breathing resumes, the rescuer tags the victim immediate and moves to the next victim. If the victim is still not breathing, the rescuer tags him or her deceased and moves on.
If the victim is breathing but the respirations are at a rate over 30 breaths per minute, the rescuer tags him or her immediate and moves to the next victim. If the victim is breathing but the respirations are less than 30 per minute, the rescuer assesses the victim’s perfusion.

**Perfusion**

The victim has passed the ventilation test. Now the rescuer simply assesses the perfusion by squeezing the victim’s finger nail and counting the time it takes for the color to return under the nail. If the color takes longer than 2 seconds to return (one-thousand-one, one-thousand-two), the rescuer tags the victim immediate and moves to the next victim. If the color returns in less than two seconds, the rescuer assesses the victim’s mental status.

If the fingernail is covered by nail polish, the rescuer chooses an ear lobe or other exposed part of the body that he or she can squeeze and watch the return of blood flow.

**Mental Status**

The victim has passed the ventilation and perfusion test. The rescuer simply asks the victim some simple questions (for example, name, date, or place). If the victim cannot respond correctly to the questions, the rescuer tags him or her immediate and moves to the next victim. If the victim does respond correctly, the rescuer tags him or her delayed and moves to the next victim.

The mental status can really be assessed while completing the ventilation and perfusion tests. As an example, if the victim is unconscious but breathing, the rescuer tags him or her immediate and moves on.

With very little practice, a first responder can easily sort the victims, leaving the more highly trained medical personnel to concentrate on the treatment of the victims when they reach the treatment unit.
Figure 4-5: S.T.A.R.T. Algorithm
The treatment unit leader position typically is the next to be established. The treatment unit leader will establish an area where patients can be collected and treated. Central treatment areas maximize the limited resources of rescuers in incidents that involve large numbers of patients. It is in the treatment area that extensive treatment and advanced life support care are conducted.

The treatment unit leader is responsible for the overall management of patient care in the treatment area. He or she will:

- Identify and establish a suitable area for treatment operations, communicating that location to the medical group supervisor and the triage unit leader;

- Locates the treatment area in close proximity to the transportation area:
  - Upwind and uphill,
  - Sufficient space for operations (Think BIG!),

**Figure 4-6: Incident Basic Organization, Part 5**
* Unimpeded access and egress for units, and

* Separate areas for patients classified as immediate, delayed and minor;

- Identify and request additional resources as needed:
  * Communications,
  * Personnel:
    - Treatment dispatch manager,
    - Immediate treatment manager,
    - Delayed treatment manager, and
    - Minor treatment manager;
  * Equipment and supplies; and
  * Relief or other support units;

- Coordinate with the triage unit leader the movement of patients from triage area to treatment areas;

- Receive patients in the treatment area (separated by triage category):
  * Reassess and retriage as appropriate,
  * Render prompt and efficient treatment in accordance with established Advanced Life Support/Basic Life Support (ALS/BLS), and

- Establish communication and coordination with the patient transportation group supervisor;
• Assign, supervise, and coordinate personnel within area(s);

• Ensure safety of all members operating in the treatment area;

• Ensure efficacy of treatment operations;

• Direct movement of patients to ambulance loading area;

• Provide frequent progress reports to the medical group supervisor; and

• Maintain incident documentation.

If the incident is large scale with large numbers of patients, the treatment unit leader may need to assign other support positions within the unit.

Treatment managers: Activating these positions is primarily a span-of-control need. Assign one each for the immediate delayed and minor treatment areas. Their roles are to ensure that patients are treated and packaged for transport as soon as possible.

Treatment dispatch manager: This position is also a span-of-control position. The position ensures that the patient is ready for transport and coordinates with the patient transportation group and treatment managers.

These two positions will be discussed in more detail in the next section, Expanding the Organization.
Patient Transportation Group Supervisor

Figure 4-7: Incident Basic Organization, Part 6

The patient transportation group supervisor has a substantial challenge. The supervisor must obtain all required transportation and make sure the patients are transported to the appropriate hospitals. Hospitals will need to be notified. There will be an almost continuous flow of radio communication between the group and the receiving hospitals (either direct radio communications from the scene to the hospital, or relayed through a dispatch center).

The patient transportation group supervisor is responsible for the overall management of patient movement from the scene to the receiving hospitals. Special attention must be given to the needs of the patients, and whether transport to a specialty center is required. In addition to patient condition, the receiving hospital’s ability to handle additional patients and the overall impact on the EMS system must be part of the decision-making process on patient destinations.

To accomplish this the patient transportation group supervisor must:
• Establish an adequately sized, easily identifiable patient loading area in coordination with the treatment unit leader;

• Establish communication with area hospitals and maintain list of capacities;

• Designate an ambulance staging area (if needed);

• Identify and request additional resources as required:
  * Communications and
  * Personnel:
    – Medical communications coordinator,
    – Air ambulance coordinator, and
    – Ground ambulance coordinator;

• Direct the transportation of patients in coordination with the treatment unit leader;

• Request air and ground ambulances as needed;

• Coordinate air ambulance transportation;

• Establish an air ambulance helispot(s) as needed; and

• Maintain patient tracking records and other incident documents.
The Basic Organization

With this basic command organization in place, additional arriving resources are assigned to existing divisions/groups/units. These additional resources work for, report to, and communicate to the division/group supervisor or unit leader.

Expanding the Organization

The basic ICS organization described thus far shows a command structure that typically may be developed for the first wave of resource commitment.

As additional resources arrive on the scene, they may be assigned to existing positions, as illustrated below.

The ICS also may be expanded to meet incident needs.
Expanded Generic ICS Positions for EMS Incidents

Staging Area Manager

Proper positioning of vehicles at an emergency incident is the key to a successful operation. All too often, responding units arrive at the scene, leave their vehicles wherever space can be located, and depart to the incident site with equipment in hand. Abandoning vehicles can be obstructive to resource management, redeployment, and effective use of available resources. It has the potential to disrupt the transport of patients to receiving hospitals, which could lead to a patient’s death.
The strength and efficacy of a staging area manager are integral to the success of the overall management of an incident. The staging area manager is responsible for:

- Managing an area for resources to be temporarily located while activating tactical assignment;
- Reporting to the operations section chief or to the IC in the absence of an operations section chief;
- Assembling, coordinating, and controlling resources assigned to staging (personnel, vehicles, and equipment):
* Ensuring unimpeded access to and egress from staging area and access and mobility of resources within the staging area;

* Establishing an accurate inventory system for all responding units (check in/check out);

* Providing routing instructions for resources given tactical assignments;

* Requesting maintenance services for staged resources as needed;

* Safeguarding staging (law enforcement assistance may be required);

* Determining required reserve level(s) for assigned resources by type and kind from the operations section chief (for example, backup resources);

* Advising the operations section chief when a particular type of resource is at or near minimum reserve level;

* Coordinating access to EMS vehicles with ground ambulance coordinator;

* Ensuring safety of members operating in the staging area;

* Evaluating the staging area operations for efficacy and communicating resource requirements to the operations section chief; and

* Providing frequent progress reports to the operations section chief.
Helibase Manager/Landing Zone

Where helicopter transportation is needed, a helibase manager and Landing Zone (L/Z) will be required.

Responsibilities of this position include:

- Locating a safe and adequately sized L/Z;
- Advising command and the patient transportation group supervisor of the L/Z location;
- Ensuring the L/Z site safety;
- Maintaining communications with helicopters;
- Securing safe routes for ground ambulances entering and exiting the L/Z;
- Requesting and supervising resources as needed; and
- Maintaining incident documentation.

If the incident involves multiple aircraft, an air operations branch may be established. The purpose of the air operations branch director is to serve as an “air traffic control,” and to ensure safe operations of all inbound, exiting, and overhead aircraft.

Expansion of ICS Multicasualty Branch

As an incident’s needs are identified and expanded further, there will be a need to implement additional ICS positions related to medical operations. Additional positions may be needed within the medical group and the patient transportation group.
Medical Group/Division

Within the medical group/division, personnel may be needed as treatment team managers, treatment dispatch manager, and medical supply coordinators. These positions are implemented as span-of-control mechanisms.

Figure 4-11: Expansion of the Multicasualty Branch

Treatment Team Managers

Based on the number of patients and triage categories there may be a need to implement specific treatment team managers. Typically, there is one treatment team manager for each designated triage category, that is, immediate, delayed, or minor.
A treatment team manager is responsible for:

- Assigning treatment personnel to patients,
- Requesting medical terms as necessary,
- Ensuring the continual triage of patients within the area,
- Ensuring that patients are prioritized for transport,
- Coordinating with the treatment dispatch manager for the transport of patients, and
- Ensuring appropriate patient documentation.

Figure 4-12: Medical Group
Treatment Dispatch Manager

The treatment dispatch manager acts as the liaison between the treatment manager and the patient transportation group. The responsibilities for this position include:

- Establishing and maintaining communications with the treatment managers and the medical communications coordinator;
- Advising the medical communications coordinator when patients are ready for transport;
- Verifying with the treatment managers the priority for patient transports and any special needs, such as a burn center or pediatric facility;
- Coordinating the loading of patients with the transport personnel and treatment managers;
- Assuring appropriate tracking of patient information; and
- Coordinating ambulance loading with treatment manager and ambulance personnel.

Medical Supply Coordinator

As a medical incident progresses, the need for additional medical supplies will be evident. The medical supply coordinator is responsible for procuring, maintaining, and distributing medical supplies to the treatment and triage units. In a fully expanded ICS organization, the medical supply coordinator will communicate and coordinate with the logistics section—supply unit leader.

Morgue Manager

The morgue manager:

- Coordinates activity with law enforcement representative for area security;
• Identifies and secures suitable area for the morgue and coordinates with the logistics section to secure refrigerated truck and pallets, if necessary);

• Coordinates with medical examiner/coroner representative regarding removal of the deceased;

• Ensures completion of all associated documents related to the deceased and transfer of possession of the remains from the agency to other authorized authorities;

• Ensures safety of members operating in the area;

• Communicates progress reports to the IC as required;

• Keeps identity of the deceased confidential; and

• Maintains appropriate incident information.

**Patient Transportation Group**

Within the patient transportation group, three additional positions may be required as the incident expands. These positions are the medical communications coordinator, the ground ambulance coordinator, and the air ambulance coordinator.

**Medical Communications Coordinator**

As the incident becomes more complex the need to establish formal communications to outside resources will be evident. The primary role of the medical communications coordinator is to maintain communications with medical facilities in order to assure proper and rapid transport of patients to appropriate facilities. This critical position’s responsibilities must not be overlooked.
The medical communications coordinator’s responsibilities include:

- Establishing communications with individual medical facilities or a regional control point if available;

- Maintaining the current status of medical facility availability and capability;

- Communicating and coordinating with the treatment dispatch manager and ambulance coordinators of the transport of patients;

- Coordinating off-incident patient destinations with the medical facilities; and
• Maintaining appropriate incident documents and medical facility availability and capability records.

A key function of the ICS multicasualty branch is to not relocate the incident to a given hospital. The medical communications coordinator is a critical part of that function by being the link from incident site to area or regional medical facilities. Based on initial incident size up and projections, the medical communications coordinator may in fact be one of the first positions filled when setting up the ICS.

Ground Ambulance Coordinator

The primary function of the ground ambulance coordinator is to manage the ambulance staging area(s) and to dispatch ambulances to the treatment/loading areas as needed. These responsibilities include:

• Establishing an ambulance staging area and logging in ambulance units as they arrive;

• Coordinating and communicating with the helibase manager or air operations branch director for air ambulance options;

• Establishing and maintaining communications with the medical communications coordinator and treatment dispatch manager;

• Providing ambulance resources as requested by the medical communications coordinator;

• Providing an inventory of medical supplies available at the ambulance staging area for use at the incident;

• Assuring that necessary equipment is available in the ambulance for patient needs during transport;
Establishing contact with ambulance agencies at the scene;

Requesting additional transportation resources as appropriate; and

Maintaining incident documentation as required.

Air Ambulance Coordinator

The basic function of the air ambulance coordinator is the same as for the ground ambulance coordinator except for added responsibilities associated with aircraft operations. Any time aircraft are used to transport patients, additional coordination is required to maintain safe operations. Therefore, the air ambulance coordinator must be in communication with the designated incident landing zone officer (helispot/base manager) or air operations manager.

The role of the air ambulance coordinator is to coordinate with the aircraft crew the loading of designated patients. Additionally, the air ambulance coordinator must communicate aircraft patient capabilities to the medical communications coordinator in order to have effective and appropriate use of the aircraft.

In coordinating the movement of patients from the treatment areas to the landing zone, consideration should be given to selecting and assigning a specific ground unit(s) for this task. Use of the same ground unit and its personnel will enhance safety considerations around the aircraft. This need should be coordinated with the ground ambulance coordinator.
Activity 4.1:
Liberty County Vehicle Accident
Student Activity Worksheet

Time: 90 minutes

Purpose:
To address several issues relative to incident management, including organizational structure, resource needs, potential problems, and sorting victims using the S.T.A.R.T. system of triage.

Directions:
1. The instructor will assign you to a small group.

2. You will read and analyze the following incident scenario. Your group will assume the role of the duty battalion chief.

3. Outline the incident in an organizational chart format on a flipchart, using ICS covered in this module. Be specific as to any ICS position titles you would fill and who would fill them.

4. Sketch an incident map showing the EMS functional areas in relationship to the incident.

5. Prepare a list of what you project to be potential problems, resource needs, and issues, and how you would address each of these items.

6. Review the patient information, and using the S.T.A.R.T. system of triage, circle the category on the Patient List chart that the patient would be placed in.

7. Each group will select a group spokesperson to present their conclusions to the class.

You will have 60 minutes to prepare your ICS charts; list potential problems, resource needs, and issues and how you will address them; and assign victims to triage categories.

At the end of the allotted time, the instructor will call on the group spokespersons to report to the class.
Scenario:

Day/time: Friday, 2000 hours, mid-January

Weather: temperature 45°F, winds are SSE @ 5 to 10 mph with overcast skies

Initial report: 911 telephone call reporting a vehicle accident with victims trapped at State Route 52 and East Lake. Reporting party could not tell how many people were trapped or how many vehicles were involved. It was too dark for them to tell.

Initial dispatch: At 2001 hours Liberty Communications dispatches an initial vehicle extrication response to include:

- 2 Liberty County Sheriff’s units
- Liberty Engine 203
- Central Truck 101
- Liberty Battalion 1
- LifeLine 22

Notes:
SCENARIO BASIC INFORMATION

Time: 2000 hours
Date: January 20
Weather: 45°F, winds from SSE @ 5 to 10 knots, overcast skies.

2000 HOURS

Liberty Communications to:
Liberty Engine 201
Central Truck 101
Liberty Battalion 1
LifeLine 22
Liberty County Sheriff’s Units

Message:
Reported traffic accident at the intersection of State Route 52 and East Lake. Possible people trapped.

2003 HOURS

Able Flight 1 to Liberty Communications:

Message:
Currently over the East Lake accident. Appears to be minimum of three vehicles. Two vehicles over the side. One appears to be a large vehicle. We will try to get a closer look.

Liberty Battalion 1 to Liberty Communications:

Message:
Copy Able’s traffic—multiple vehicles.
2004 HOURS

Able Flight 1 to Liberty Communications:

Message:

Confirmed three vehicles. Two over side. One appears to be a bus. The other two sedans.

Liberty Engine 203 to Liberty Communications:

Message:

Engine 203 on scene; stand by for report on conditions.

2005 HOURS

Liberty Engine 203 to Liberty Communications:

Message:

Three vehicles involved. Multiple victims trapped inside an overturned bus that is off the road and down an embankment 25 feet. Appears to be at least 15 victims. Assuming Lake Command.

LifeLine 22 to Liberty Communications:

Message:

On scene.
2007 HOURS

Lake Command to Liberty Communications:
Message:
This will be a mass-casualty incident. Triage in progress. Request an MCI response per Liberty County EMS plan.

Liberty Communications to Lake Command:
Message:
Copy MCI response—prepare to copy resources. Liberty Battalion 1 copies.

2007 HOURS (CONTINUED)

Central Truck 101 to Liberty Communications:
Message:
On scene.

Liberty Battalion 1 to Liberty Communications:
Message:
On scene; assuming Lake Command.

2008 HOURS

Liberty Communications to Lake Command:
Message:
Copy Liberty Battalion 1 now Lake Command. Stand by to copy the MCI response. Liberty Fire Chief has been notified and is responding—ETA 20 minutes.
Liberty Communications to Lake Command:

Message:

MCI response and ETAs are:

Liberty Battalion—2 to 5 minutes
Liberty Engine 201—6 minutes
Liberty Engine 202—6 minutes
Liberty Engine 205—7 minutes
Central Truck 102—8 minutes W/3
Central Mass-Casualty—8 minutes W/1

MCI response and ETAs (continued):

Medflight 1—8 minutes
Medflight 2—16 minutes
LifeLine 21—5 minutes
LifeLine 24—5 minutes
LifeLine 25—8 minutes
Community 31—6 minutes
Community 33—8 minutes
Community 34—9 minutes
Central Medic 101—7 minutes
Central medic 103—9 minutes
Central Medic 106—10 minutes
Triage to Lake Command:

Message:

There is a total of 30 patients. Triage report is being brought to the command post at this time. At least 10 patients will require extensive extrication work. At least 2 hours to free all patients. The bus appears stable. No fuel leak detected at this time. Second vehicle stable with fuel leak. One DOA.
## Activity 4.1:
### Patient List

<table>
<thead>
<tr>
<th>Victim</th>
<th>Type of Injury</th>
<th>Pertinent Information</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Compound fracture, left femur</td>
<td>Respiration over 30/minute, Radial pulse absent, Awake</td>
<td>Deceased, Immediate, Delayed, Minor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>#2</td>
<td>Sudden onset of chest pain with shortness of breath</td>
<td>Respiration under 30/minute, Capillary refill under 2 seconds, Awake</td>
<td>Deceased, Immediate, Delayed, Minor</td>
</tr>
<tr>
<td></td>
<td>Trapped</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#3</td>
<td>90% second degree burns</td>
<td>Respiration none, Radial pulse present, Unconscious</td>
<td>Deceased, Immediate, Delayed, Minor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#4</td>
<td>Facial injury</td>
<td>Respiration over 30/minute, Capillary refill under 2 seconds, Awake</td>
<td>Deceased, Immediate, Delayed, Minor</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>#5</td>
<td>Unable to move legs</td>
<td>Respiration under 30/minute, Radial pulse present, Awake</td>
<td>Deceased, Immediate, Delayed, Minor</td>
</tr>
<tr>
<td></td>
<td>Trapped</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#6</td>
<td>No apparent injuries</td>
<td>Respiration normal, Capillary refill under 2 seconds, Awake</td>
<td>Deceased, Immediate, Delayed, Minor</td>
</tr>
<tr>
<td>Victim</td>
<td>Type of Injury</td>
<td>Pertinent Information</td>
<td>Category</td>
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<tr>
<td>--------</td>
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<td>------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>#7</td>
<td>Sucking chest wound</td>
<td>Respirations over 30/minute Radial pulse present Unconscious</td>
<td>Deceased</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Immediate</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Delayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>#8</td>
<td>Dislocated right shoulder</td>
<td>Respirations under 30/minute Radial pulse present Awake</td>
<td>Deceased</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Immediate</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Delayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>#9</td>
<td>Trapped</td>
<td>No visible wounds</td>
<td>Deceased</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Respirations none Radial pulse absent Unconscious</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Delayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>#10</td>
<td>Scalp wound, estimated blood loss 500 cc</td>
<td>Respirations over 30/minute Capillary refill under 2 seconds Awake</td>
<td>Deceased</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Delayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>#11</td>
<td>Trapped</td>
<td>Massive head injury</td>
<td>Deceased</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Respirations under 30/minute Radial pulse absent Unconscious</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Delayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>#12</td>
<td>Bruising over abdomen, complaining of abdominal pain</td>
<td>Respirations over 30/minute Capillary refill under 2 seconds Awake</td>
<td>Deceased</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Delayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>#13</td>
<td>Trapped</td>
<td>Impaled, 1 foot piece of shrapnel in right eye</td>
<td>Deceased</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Respirations under 30/minute Radial pulse present Awake</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Delayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>Victim</td>
<td>Type of Injury</td>
<td>Pertinent Information</td>
<td>Category</td>
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<tr>
<td>--------</td>
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<td>----------</td>
</tr>
<tr>
<td>#14</td>
<td>Female six-months pregnant; broken left, lower leg</td>
<td>Respirations under 30/minute, Capillary refill under 2 seconds, Awake</td>
<td>☑Deceased, ☑Immediate, ☑Delayed, ☑Minor</td>
</tr>
<tr>
<td>#15</td>
<td>Severe difficulty breathing, chest sinks in on inspiration</td>
<td>Respirations over 30/minute, Radial pulse present, Awake</td>
<td>☑Deceased, ☑Immediate, ☑Delayed, ☑Minor</td>
</tr>
<tr>
<td>#16</td>
<td>Unable to move, no verbal response</td>
<td>Respirations under 30/minute, Radial pulse present, Awake and staring</td>
<td>☑Deceased, ☑Immediate, ☑Delayed, ☑Minor</td>
</tr>
<tr>
<td>#17</td>
<td>Amputated left arm, bleeding controlled</td>
<td>Respirations under 30/minute, Capillary refill under 2 seconds, Awake</td>
<td>☑Deceased, ☑Immediate, ☑Delayed, ☑Minor</td>
</tr>
<tr>
<td>#18</td>
<td>Large head wound, brain matter showing</td>
<td>Respirations absent, Radial pulse absent, Unconscious</td>
<td>☑Deceased, ☑Immediate, ☑Delayed, ☑Minor</td>
</tr>
<tr>
<td>#19</td>
<td>Minor abrasions</td>
<td>Respirations under 30/minute, Capillary refill under 2 seconds, Awake</td>
<td>☑Deceased, ☑Immediate, ☑Delayed, ☑Minor</td>
</tr>
<tr>
<td>#20</td>
<td>Bruise on forehead, blood in ears and nose</td>
<td>Respirations under 30/minute, Radial pulse present, Unconscious</td>
<td>☑Deceased, ☑Immediate, ☑Delayed, ☑Minor</td>
</tr>
<tr>
<td>Victim</td>
<td>Type of Injury</td>
<td>Pertinent Information</td>
<td>Category</td>
</tr>
<tr>
<td>--------</td>
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<td>-----------------------</td>
<td>----------</td>
</tr>
<tr>
<td>#21</td>
<td>Third degree burns over front of both legs</td>
<td>Respirations under 30/minute Radial pulse present Awake</td>
<td>☑Deceased ☑Immediate ☑Delayed ☑Minor</td>
</tr>
<tr>
<td>#22</td>
<td>Compound fracture, left arm</td>
<td>Respirations under 30/minute Radial pulse present Awake</td>
<td>☑Deceased ☑Immediate ☑Delayed ☑Minor</td>
</tr>
<tr>
<td>#23</td>
<td>Impaled stick in right chest</td>
<td>Respirations under 30/minute Capillary refill under 2 seconds Awake</td>
<td>☑Deceased ☑Immediate ☑Delayed ☑Minor</td>
</tr>
<tr>
<td>#24</td>
<td>Second degree burns, legs</td>
<td>Respirations over 30/minute Radial pulse present Awake</td>
<td>☑Deceased ☑Immediate ☑Delayed ☑Minor</td>
</tr>
<tr>
<td>#25</td>
<td>Blood in right eye</td>
<td>Respirations under 30/minute Capillary refill under 2 seconds Awake</td>
<td>☑Deceased ☑Immediate ☑Delayed ☑Minor</td>
</tr>
<tr>
<td>#26</td>
<td>Three month old infant, no visible injury</td>
<td>Respirations absent Radial pulse present Unconscious</td>
<td>☑Deceased ☑Immediate ☑Delayed ☑Minor</td>
</tr>
<tr>
<td>#27</td>
<td>Impaled object, RUQ abdomen; difficulty breathing</td>
<td>Respirations over 30/minute Radial pulse present Awake</td>
<td>☑Deceased ☑Immediate ☑Delayed ☑Minor</td>
</tr>
<tr>
<td>Victim</td>
<td>Type of Injury</td>
<td>Pertinent Information</td>
<td>Category</td>
</tr>
<tr>
<td>--------</td>
<td>----------------</td>
<td>-----------------------</td>
<td>----------</td>
</tr>
<tr>
<td>#28</td>
<td>Patient saying same words over and over, “What happened?”</td>
<td>Respirations under 30/minute Radial pulse present Awake</td>
<td>❑ Deceased ❑ Immediate ❑ Delayed ❑ Minor</td>
</tr>
<tr>
<td>#29</td>
<td>Spurting blood from neck injury</td>
<td>Respirations over 30/minute Radial pulse present Awake</td>
<td>❑ Deceased ❑ Immediate ❑ Delayed ❑ Minor</td>
</tr>
<tr>
<td>#30</td>
<td>Trapped</td>
<td>Patient states she is a diabetic; skin moist and clammy; feels shaky</td>
<td>Respirations under 30/minute Capillary refill over 2 seconds Awake</td>
</tr>
</tbody>
</table>
Activity 4.1:
Liberty County Vehicle Accident
Student Assessment Sheet

Group presentations:
When you have completed the exercise, your group’s spokesperson will report on your group’s ICS chart; lists of potential problems, resource needs, and issues and how you would address each of the items; and how many immediate, delayed, minor, and deceased victims they counted.

As you listen to other groups’ answers, compare them to yours. If you have questions about their answers, ask them. The intent is not to determine who is correct or not, but to point out the need and benefits of an ICS in organizing an emergency incident and addressing projected needs and problems.

As the instructor tells the correct answers for patient triage, mark them on your Patient List chart.
Module Summary

Every community is subject to the potential of incidents that are out of the norm. These incidents require an ICS organization to control, organize, and direct responders toward efficient patient care.

In this module, we discussed the basic ICS organization at EMS incidents, including:

- Roles and responsibilities of the:
  - Incident Commander,
  - Division/group supervisors,
  - Unit leaders, and
  - S.T.A.R.T. system.

The basic organization can be expanded as incident needs are identified. Implementing new positions maintains span-of-control. Discussion of the expanded ICS organization included:

- Roles and responsibilities of the:
  - Staging area manager and
  - Helibase manager/Landing Zone (L/Z).

The last topic of discussion was the ICS multicasualty branch, which included the:

- Medical group:
  - Triage unit and
* Treatment unit; and

- Patient transportation group:
  
  * Medical communications coordinator,
  
  * Ground ambulance coordinator, and
  
  * Air ambulance coordinator.
MODULE 5

SLIDES
Chief Officer Training Curriculum

Operations
Module 5:
Health and Safety Officer, Laws and Standards

Objectives

♦ Identify health risk factors that affect firefighters both long-term and on the fireground
♦ Identify risk categories that affect firefighters on a long-term basis
♦ Identify components of an Employee Assistance Program (EAP)
♦ Identify how health and safety standards affect safety on and off the fireground

The Health and Safety Officer

♦ Reports to head of organization
♦ Trained to Fire Officer I
♦ Has major effect on department emergency operations
♦ Performs duties outlined in NFPA 1521
♦ May be full or part-time
The Health and Safety Officer (continued)

- Volunteer departments—HSO may be promotion and not chief officer
- Better not to split responsibilities
- Only one HSO

Firefighter Injury and Deaths

- 1988 to 1992—average of more than 100,000 firefighter injuries each year
  - 50% occurred on fireground
- 1977 to present—average of one death every 3 days
  - Over 50% occur on fireground
Firefighter Injury and Deaths
(continued)

♦ The leading cause of firefighter deaths is heart disease/stress
♦ 25% of stress-related deaths are less than 40-years old

Ending up dead or injured at work is against the law!

Health Risk Factors

Name several health risk factors that affect firefighters:
♦ On the fireground
♦ Long-term
Fireground Risk Factors

- Physical fitness
- History of illnesses
- Medications

Long-Term Risk Factors

- Smoking
- Hearing loss
- Back injuries
- Cancer

Long-Term Risk Factors (continued)

- Hearing loss:
  - Hearing protection program—OSHA standard
  - Mandated protection for personnel on apparatus
  - Baseline audiometric test
  - Annual testing
  - Standards in NFPA 1582
Long-Term Risk Factors (continued)

- Back injuries—largest category of workers’ compensation injuries
- Cancer—skin cancer among most common forms

Firefighter Wellness Programs

List the components of a comprehensive wellness program:

- Annual physical exams
- Employee Assistance Program (EAP)
- Physical fitness program
- Infection control program
Firefighter Wellness Programs
(continued)

What vaccinations does your department provide for its members?

Vaccinations:

♦ Hepatitis B
♦ Hepatitis A
♦ Tetanus
♦ Flu shot
♦ Measles

Post-exposure exams:

♦ Hazardous materials
♦ Blood or body fluids
Define an EAP and list some of the components:

- Firefighter Wellness Programs
- Substance abuse
  - Alcoholism
  - Drug addiction
  - Tobacco
- Stress management
  - CISM
- Family relations
- Legal and financial concerns
- Health promotions

Physical fitness program:
- Medical screenings
- Fitness assessments
- Fitness standards
- Exercise program
- Nutrition
Firefighter Wellness Programs (continued)

Infection control:
- Exposure-control plan for members at risk
- Training and education
- Engineering and work control practices
- Hepatitis B vaccination
- Medical treatment, post-exposure evaluation, and follow-up
- Record keeping

Firefighter Wellness Programs (continued)

What program or operation affects the health and safety of firefighters on an emergency scene?

Firefighter Wellness Programs (continued)

Rest
Refreshment
Medical Evaluation
Treatment
Firefighter Wellness Programs (continued)

- Provide on-scene screening process to determine if personnel operating in danger of collapsing
- Provide monitoring device to gauge how firefighters react physiologically to stress of operation

Record Keeping and Documentation

- NFPA 1500, Chapter 10.4
- Occupational Safety and Health Act of 1970
Record Keeping and Documentation
(continued)

Employee medical records—confidential:
- Annual physical report
- Return-to-duty reports
- Workers’ compensation reports
- Records of vaccinations
- Exposure reports

Record Keeping and Documentation
(continued)

- Compile statistics
- Evaluate department records:
  - Annual injury/illness report
  - Lost-time report
  - Workers’ compensation expenses
  - Medical exams/therapy expenses

Activity 5.1

Action Plan for Health Maintenance
Consensus Standards

- Procedure or document that can be followed
- Developed reactively
- Not mandatory unless adopted by public authority

NFPA Standards

- NFPA 1500, Standard for a Fire Department Occupational Safety and Health Program
- NFPA 1521, Standard for a Fire Department Safety Officer
- NFPA 1561, Incident Management System
- NFPA 1581, Fire Department Infection Control Program
- NFPA 1582, Standard for Medical Requirements for Fire Fighters
NFPA Standards (continued)

- Protective clothing and equipment standards
- Design criteria for fire apparatus and equipment
- Professional qualifications
- Training standards

Federal Regulations

OSHA:
- Branch of Department of Labor & Industry
- Created in 1970
- 23 states and two territories have state-operated programs
- Remaining states governed by Federal program, excluding municipal and volunteer FF

Federal Regulations (continued)

Regulations affecting worker safety and health:
- 1910.20—Medical Record Keeping
- 1910.1030—Occupational Exposure to Bloodborne Pathogens
- NFPA 1581, Standard for Fire Department Infection Control Program
Activity 5.2

Laws, Standards, and Regulations

Standard Operating Guidelines

- Developed by department in standard format
- Affect only the department that writes and adopts them
- Must meet or exceed applicable laws and regulations

Effect of Laws, Standards, and Regulations on Operations

- Provide a safe and healthy work environment
- Reduction of risk and decrease in liability
- Fire chief assigns HSO as program manager
Effect of Laws, Standards, and Regulations on Operations (continued)

- Promotes positive image inside/outside department
- Provide basis for department SOPs
- HSO develops network that provides information on new issues/changes
- HSO provides this information to the department

Module Summary

- Health risk factors—fireground and long-term
- Wellness programs
- Record keeping and documentation
- Laws, standards, and regulations
MODULE 5

HEALTH AND SAFETY OFFICER, LAWS AND REGULATIONS
MODULE 5:

HEALTH AND SAFETY OFFICER, LAWS AND REGULATIONS

Objective

Upon completing the module, you will be able to compare health and safety laws, standards, and regulations to written Standard Operating Guidelines (SOGs) for proper content.

References


Methodology

This module uses lecture, discussion, and activities.
NFPA 1021 Standards Cross-Reference Matrix

3-2, 3-4, 3-7, 4-2, 4-4, 4-7
Introduction

Every department should recognize the need for an HSO; the organizational structure of a department will dictate job functions of the HSO. In a medium or large department, an HSO position may be established and operate on a daily basis and/or a shift schedule. In a small department, the OSH committee may assume these duties in lieu of an HSO, or the position may be assigned as a part-time position, such as a department training officer. Regardless of the size of the department, there should be an OSH committee.

An HSO will be responsible for managing the daily operations of the safety and health program. His or her duties will be defined by department policy, position description, or within the safety and health program. NFPA 1521 lists prescribed functions for the HSO.

According to the NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, every fire department, regardless of size, must have an individual assigned to the duty of the Health and Safety Officer (HSO). In NFPA 1500 and other NFPA documents, this individual is known as the Fire Department Safety Officer (FDSO). An HSO also is strongly recommended for other emergency response organizations, such as the EMS departments. The HSO must be an officer within the agency, most often appointed by the fire chief or head of the agency, and reporting to the chief or the chief’s designee. Status as an officer will help the HSO provide the needed safety emphasis for the agency. The HSO’s most significant responsibility is managing the agency’s safety program. Ultimate responsibility for the safety of responders still rests with the fire chief or the head of the organization, but the HSO can help the fire chief ensure that responders are safe by placing an emphasis on safety. There is only one HSO per response agency.
The Health and Safety Officer

The fire department HSO must be trained to NFPA Fire Officer Level I according to the requirements of NFPA 1521, *Standard for Fire Department Safety Officer*. All safety officers, including the HSO, must have a knowledge of firefighting and its hazards, rules, and regulations that affect fire department operations, such as NFPA standards, departmental Standard Operating Guidelines (SOGs), safety management, and physical fitness. The majority of the HSO’s activities will be performed in a non-emergency setting; however, the work of the HSO has a major impact on emergency operations. The HSO may act as an Incident Safety Officer (ISO) and provide safety supervision on emergency scenes.

NFPA 1521 outlines requirements for the training, certification, and functions of the HSO.

Some of the major duties of the HSO include:

- Development of SOGs for high-risk activities such as emergency driving, wildland and structural firefighting, and the use of protective clothing and equipment such as Self-Contained Breathing Apparatus (SCBA);

- Development and delivery of safety training courses for members of the fire department;

- Development and management of injury and exposure documentation systems;

- Provision of input into all fire department pre-emergency, emergency, and non-emergency operations to ensure that the safety of responders is considered at all times;

- Development and support of appropriate physical fitness programs for responders;
• Analysis of fire department and national firefighter injury and death studies to develop a means of preventing the recurrence of such incidents;

• Help with the research, purchase, and use of protective clothing and equipment; and

• Knowledge of national standards for safety equipment and operational safety.

Regulations, standards, and policies will affect the NPCO on a regular basis. It is important to realize that these regulations originate in different ways and affect different organizations in different ways. This module will explore some of the regulations that currently apply to the fire service, but you should recognize that, like anything else, laws change constantly.

Legal research must be performed to determine which regulations will affect your agency. In this module, we will discuss the different regulations and how they may affect you.

Background and Significance

Each department must operate under the guidelines of a written safety and health program. NPFA 1500 is a valuable resource. A review and revision process must be used to evaluate the safety and health program routinely.

Firefighter Injuries and Deaths

Fatalities

In 1997, 94 firefighters died on duty. This represents a drop of 1 death from 1996 and is slightly lower than the 96 firefighters who gave their lives in 1995. The total of 94 fatalities is the third lowest recorded in the 20 years that the USFA has been collecting these data. It is only the fifth time that the total has been fewer than 100 fatalities. The lowest
years were 1992, with 75 fatalities and 1993, with 77 fatalities.

The 1997 number of on-duty deaths continues the long-term trend of reduced fatalities that began in 1979, after a peak of 171 in 1978. The overall trend in firefighter fatalities is down 20 percent over the past 10 years; however, the rate of reduction in the past 5 years has slowed to 4 percent, partly due to the uncharacteristically low number of deaths that occurred in 1992 (75) and 1993 (77). From 1977 through 1997, there was an average of one firefighter fatality every three days.

As in previous years, the largest proportion of 1997 deaths occurred during fireground operations. There were 41 fireground deaths in 1997, which accounted for 43.6 percent of the fatalities. Of the 41 fireground deaths, over one-third (14) resulted from heart attacks that occurred on the fire scene.

In 1997, 15 percent of the total number of deaths caused by heart attacks occurred in firefighters who were aged 40 or under. Stress (heart attacks, strokes, seizures) seems to play an increasing role as age increases.

The average annual percentage of on-duty firefighter deaths caused by stress (heart attacks, strokes, seizures) in the past 10 years (1988-1997) was 46.9 percent. The overall leading cause of on-duty firefighter deaths is stress, usually manifesting itself in heart attacks.

Injuries

From 1992 to 1996, there were more than 87,000 firefighter injuries each year, of which 50 percent or more occurred on the fireground. The most common types of fireground injuries were strains, sprains, and muscle pain, followed by wounds, cuts, bleeding, and bruises. Smoke or gas inhalation accounted for approximately 10 percent of injuries, and burns made up another 10 percent. The leading causes of fireground
injuries were overexertion and strains. Falls slips, and jumps were the second most common cause, followed by exposure to fire products and firefighters being struck by an object, in that order.

**Health Risk Factors for Firefighters During Fireground Operations**

The risk factors outlined below can affect firefighters operating at emergency scenes and increase the likelihood that injuries could occur.

**Lack of Physical Fitness**

Overweight firefighters are at an increased risk of many common fireground injuries, such as strains and sprains. In addition, being overweight can be a factor in the development of cardiovascular disease. A lack of regular physical exercise contributes to the problem of being overweight and has a general effect on cardiovascular fitness and muscle strength. Both of these areas can affect firefighters’ well-being when they must perform strenuous tasks at an emergency scene.

**History of Illnesses**

Alcoholic firefighters have more chronic health problems than do other firefighters. They face an increased risk of heart problems and strokes. Nearly all of the body’s tissues and organs are affected by alcohol abuse problems.

Most firefighters are unaware of any cardiovascular problem until they develop symptoms or have acute problems. Warning signs such as high blood pressure or a family history of heart disease should create an awareness of the possibility that problems could develop at an emergency incident.

Firefighters who return to work after an illness are not always in good physical condition. If they undergo more physical stress before they have recovered completely, they may require more frequent breaks and become tired easily.
Diarrhea can cause electrolyte imbalance. When firefighters are involved in strenuous activities, these electrolytes can become even more imbalanced. When levels of important ions like potassium and sodium are disturbed, smooth muscles do not contract as well, especially the heart.

Medications

- Antihistamines (Benadryl, Actifed—normally taken for colds and sinus problems);
- Diuretics or hypertension medications (Lasix, Inderal, Isoptin, Procardia, Cardizem—prescribed for high blood pressure or other heart-related problems); and
- Stimulants—caffeine, decongestants, or diet pills.

Other Risk Categories that Affect Firefighters on a Long-Term Basis

Smoking

It is estimated that several thousand firefighters die each year from the effects of smoking. Smoking causes more lung cancer, heart disease, and lung disease than any other factor.

Smoking increases the amount of carbon monoxide carried in the blood. This reduces the amount of aerobic capacity firefighters have to perform the job.

Hearing Loss

Noise can strain the inner ear, resulting in a temporary loss of hearing. If the ear has time to rest, hearing is restored. If the exposure to noise is continual, the ear can lose its ability to recuperate and permanent damage can occur. Permanent hearing loss is caused by the destruction of cells in the inner ear.

Fire departments need to consider implementing a program to protect firefighters from hearing loss. Current OSHA noise
requirements set a maximum permissible noise level (PEL) of 90 DBA for an 8-hour period. Hearing loss as a result of noise is recognized as a significant health hazard in the fire service. Hearing protection should be mandatory for all personnel riding on fire apparatus.

New firefighters should have a baseline audiometric testing performed. All personnel should receive annual testing. Recommended standards are included in NFPA 1582.

A reference, Hearing Conservation Program Manual, is available from the USFA. The manual provides information on hearing loss and programs to help conserve hearing in firefighters.

Back Injuries

Back injuries have been reported to account for the biggest category of workers’ compensation and lost-time injuries in the workplace. The major cause of back injuries is improper lifting techniques. The key to avoiding back injuries is prevention. In addition to training on proper lifting techniques, it is important to emphasize that employees should engage in regular exercises to build flexibility and strength.

Firefighter Wellness Programs

When most people are asked to define a wellness program, they describe a physical fitness or exercise program. These are only part of an overall wellness program. A wellness program should be viewed as a pie that has several pieces that fit together. Fire departments often have one or two components of the program and call them a wellness program. There are four major components to a wellness program:

- Annual medical exams,
• Employee Assistance Program (EAP) including substance abuse,

• Physical fitness program, and

• Infection control.

Annual Medical Exams

NFPA 1500 states:

10.1.3 “Candidates and members who will engage in fire suppression shall meet the requirements specified in NFPA 1582, Standard for Medical Requirements for Fire Fighters and Information for Fire Department Physicians, prior to being medically certified for duty by the fire department physician.”

Baselines

Physical examinations and medical testing should occur both when new personnel enter the fire department and on an annual basis. It is important to establish the baseline measure of each person’s physical condition and vital signs and to develop a medical history of all personnel who may be involved in fireground activities.

A baseline medical exam for firefighters might include the following tests or examinations:

• A basic medical exam by a licensed physician,

• Electrocardiogram (EKG),

• Height,

• Weight,

• Blood pressure,
• Heart rate (pulse),

• Respiration,

• Complete medical history of illness/injuries,

• Cholesterol level,

• Triglycerides (fat level),

• Chest X-rays,

• TB skin test,

• Check for skin cancer,

• Complete blood count,

• Chemistry 23 blood test,

• Hepatitis antibodies status,

• Urinalysis,

• Tetanus update,

• Rectal exam for enlarged prostate; blood in stool,

• PSA blood test for persons over age of 50,

• Carboxyhemoglobin (baseline CO level),

• Vision test,

• Hearing test, and

• Current list of medications.
In some departments, these tests may be done on an annual basis, while others modify the frequency of evaluations. References for medical examinations can be found in NFPA 1500, Chapter 8, “Medical and Physical,” and in NFPA 1582, Standard on Medical Requirements for Firefighters.

Vaccinations

A Hepatitis B vaccination is recommended for anyone whose job puts him or her in contact with blood and body fluids. The risk of contracting Hepatitis B is far greater than that for other serious diseases. The vaccination does not always take effect with the first series, so antibody checks should be done. Recommended booster shots should be given at least every five years.

Hepatitis A vaccinations are useful in situations where exposures to floodwaters could occur. The symptoms of Hepatitis A mimic those of the flu.

Tetanus shots are given to prevent lockjaw and usually are effective for five years. However, if an injury occurs which results in an open cut or wound and it has been five years or more since the last shot, another is recommended.

Every fall it seems that a new strand of flu finds its way to the United States. Researchers try to identify the particular strain ahead of time and develop a vaccine that can lessen flu symptoms. Often the cost of giving annual flu shots to a fire department is less than the cost of lost time by workers who contract the flu.

In some parts of the country, there have been recent outbreaks of measles. Some people have had to be revaccinated, depending on when they received their initial vaccination. Because fire service EMS response could involve contact with persons who have measles, fire departments should consider vaccinating personnel who are at risk of contracting the disease.
Post-Exposure Exams

Persons exposed to different hazardous materials should be given an initial medical examination to determine the presence of any dangerous chemicals. Since some of these chemicals may not be visible immediately, a routine medical check may be necessary a few months after the incident; follow-up checks could be needed for several years.

Checks for exposures to blood or body fluids should follow the procedures outlined in the fire department infection control plan. In some cases, a medical exam will be required after an exposure of this nature as well as testing for infectious or communicable diseases.

Employee Assistance Program (EAP)

An employee Assistance Program (sometimes referred to as a Member Assistance Program [MAP]) is used to help employees who are experiencing personal problems. In some cases, these problems affect the employees’ work. Most programs of this type are intended for the employee’s family as well. The goal of an EAP is to help an individual to work through or resolve a problem or series of problems and to help him or her to have a productive life.

From the point where these problems have affected the employee’s work performance, an EAP can help to rehabilitate and return the employee to work rather than have him or her continue to the point where punishment/discipline only adds to problems.

The major components of an EAP are:

- Substance abuse program:
  - Alcoholism,
  - Tobacco, and
  - Drug addiction (legal or illegal drugs); and
• Stress management:
  * Family relations,
  * Legal and financial concerns, and
  * Health promotion.

Guidelines for these programs are included in NFPA 1500, Chapter 11.

Physical Fitness Program
Being physically fit can reduce the number of firefighter injuries and deaths, but physical fitness programs that are comprehensive and aimed at improving overall firefighter health must be developed. The five components of a complete physical fitness program are:

• Medical screening,

• Fitness assessment,

• Fitness standards,

• Exercise programs, and

• Nutrition.

The National Volunteer Fire Council has, with funding from the USFA and assistance from the Tri-Data Corporation, prepared a resource manual titled Health and Fitness Programs in the Volunteer Fire Service. This report describes health and fitness programs in nine fire departments across the United States. Information in this manual may provide volunteer departments with ideas on how to implement or provide a health and fitness program.
Medical Screening
Firefighter medical examinations should be done according to the guidelines of NFPA 1582. A baseline medical examination is performed when an employee enters the department. An annual evaluation is performed to determine if a member is able to perform job functions.

Fitness Assessment
Assessments of individual levels of fitness are based on:

- Cardiovascular fitness (aerobic),
- Muscular strength,
- Muscular endurance, and
- Flexibility.

From the results of these tests, a qualified fitness coordinator can develop an individual exercise program.

Fitness Standard
A much-debated topic in the fire service concerns an acceptable fitness standard. NFPA 1500 requires that a standard be defined. Tests to determine firefighter fitness must be valid. The IAFF, in its manual Developing Fire Service Occupational Health Programs, lists three types of validity tests:

- Content validity—validates that test elements are similar or identical to those of the job being tested;
- Criterion validity—uses statistical tests to predict job performance; and
- Construct validity—measures underlying theoretical concepts. These tests are developed by experts and may not always measure correctly the aspects of firefighting.
What happens when a firefighter cannot meet the standard established by the fire department is a question that needs to be answered before a standard is developed. In the long run, maintaining a positive rather than a negative approach toward the rehabilitation of the worker will prove to be more beneficial to the fire department and its members.

Exercise Program
An exercise program can provide tangible health benefits and reduce the changes of developing heart disease and some types of cancer. Regular exercise can help control weight and slow the aging process. An exercise program can also contribute to the mental health and well-being of individuals who participate on a regular basis.

Nutrition Program
Included in a program of this nature are basic concepts of nutrition and dietary guidelines. What you eat affects weight control and such other medical conditions as high blood pressure and high cholesterol, both of which can lead to heart disease.

Infection Control
Firefighters often come into contact with individuals who have infectious or contagious diseases. The components of a complete infection control program are:

- Exposure control plan for members at risk;
- Training education;
- Engineering and work control practices;
- Hepatitis B vaccination; and
• Medical treatment, post-exposure evaluation, and follow-up record keeping.

Fireground Rehabilitation Operations

Medical evaluations done in rehabilitation can determine whether any firefighting personnel are in danger of collapse from cardiovascular complications. Heart attacks often begin with warning signs that are easily detected by the medical personnel who staff the rehabilitation unit. In addition to chest pains, shortness of breath, and poor color, there are subtle changes in vital signs that can alert medical personnel that a firefighter is not ready to return to firefighting duties. Increased blood pressure, irregular heart rate, disorientation, and poor pulse oximetry readings will alert medical personnel that a firefighter may need to rest and receive further evaluation before returning to duty.

It is important that a complete set of vital signs (blood pressure, pulse, respiration, and temperature) be taken when a firefighter enters the rehabilitation area. Some departments that use paramedics in this unit may have the use of pulse oximetry to determine the saturation of oxygen in the blood. Firefighters should have a place where they can rest for a minimum of 15 to 20 minutes and receive refreshment. After the rest period, it is important to record the vital signs again to determine whether any significant changes have occurred.

Anyone who has abnormal vital signs upon arrival in rehabilitation should be checked more frequently. Further monitoring may be needed. In cases where life-threatening vital signs are found or when a firefighter complains of chest pain or shortness of breath, he or she should be transported to the hospital for further evaluation.

The middle of the rehabilitation area is not the ideal place to treat firefighter injuries or illnesses. Try to have any personnel who require treatment receive it elsewhere.
It is important to document all rehabilitation unit activities. All personnel on the scene, including the Incident Commander (IC) and anyone in charge of a group, division, section, or branch, should be checked at least once during an incident. Just because they were not involved in the physical aspects of the incident does not mean that they were not under any stress. There have been documented cases of ICs and other officers who have abnormal vital signs when they were checked in rehabilitation and who require further evaluation. Stress is not always caused by physical exertion.

Two objectives of rehabilitation are:

- To provide an on-scene screening process to help determine if any personnel operating there are in danger of collapsing because of cardiovascular complications and

- To monitor how firefighters are reacting physiologically to the stress of the particular operation.

In July 1992, the USFA published a manual, *Emergency Incident Rehabilitation*, which presented the first actual guidelines departments could use to establish a rehabilitation unit at their emergency incident scenes. This 10-page manual includes information on responsibilities, establishment of a rehabilitation unit, guidelines, indices on heat stress and wind chill, and sample forms fire departments use. This manual is an excellent source of material for any fire department interested in information on rehabilitation.

**Record Keeping and Documentation**

NFPA 1500, Chapter 10.4, “Confidential Health Data Base,” includes recommended guidelines for employee medical records. Chapter 10.4.1 states, “The fire department shall ensure that a confidential, permanent health file is established and maintained on each individual member.”

Chapter 10.4.2 states, “The individual health file shall record the results of regular medical examinations and physical
performance tests, any occupational illnesses and injuries, and any events that expose the individual to known or suspected hazardous materials, toxic products, or contagious diseases.”

**Employee Medical Records File**

The Occupational Safety and Health Act of 1970 requires employers to keep permanent records on employee exposures to certain potentially toxic or harmful physical agents and is regulated in Part 1910, Subpart Z. All employers are required to keep records of occupational injuries and illnesses. Part 1910, Subpart C, deals with preservation of, and access to, these records.

Examples of reports to keep in an employee’s medical records include:

- Annual physical report,
- Return-to-duty reports,
- Workers’ compensation reports,
- Records of vaccinations, and
- Exposure reports (haz mat, infectious disease).

Medical records are confidential and cannot be disclosed or released without an employee’s written consent. They should be available to anyone who has the employee’s written consent. An employee’s medical record is to be maintained for the duration of employment plus 30 years.

**Department Records—Rehabilitation Reports**

Records of firefighter medical evaluations for each incident where rehabilitation is established should be filed and maintained. This is a group record of what findings were made on a certain incident. Check these incident records
Statistics
Every fire department keeps records and compiles statistics about its entire operation. Often that collection of data is just a collection of numbers. If you are going to go to the effort of collecting information, you should make it work for you. Evaluate the records and look at what specifics are in the reports.

The following list contains examples of records to develop and maintain:

• Annual injury/illness report (department record, IAFF, OSHA Log 200);

• Lost-time report;

• Workers’ compensation expenses; and

• Medical exam/therapy expenses.
Activity 5.1:
Action Plan for Health Maintenance
Student Activity Worksheet

Time: 60 minutes

Purpose:
To identify areas for health maintenance improvement.

Directions:
1. You will individually complete the following Action Plan for Health Maintenance. You will have 20 minutes to complete the plan.

2. When you have completed it, the instructor will assign you to a small group to discuss the health maintenance programs in your departments. You will have 20 minutes to discuss their plans.

3. When the small groups have finished their discussions, the instructor will lead a large group discussion.
Action Plan for Health Maintenance

1. Which of the following programs does your department have in place?
   - Annual physical exams
   - Baselines
   - Vaccinations
   - Employee assistance program (EAP)
   - Physical fitness
   - Substance abuse
   - Infection control
   - Rehabilitation operations on the fireground

2. Of those programs not in place, which would you make a priority to implement in your department? Why should the program(s) be a priority?
3. Do the programs meet your organization’s needs? If so, how? If not, why not?

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4. In your small groups, discuss how the programs meet your organization’s needs. What can you learn from other students’ plans?

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Consensus Standards

A consensus standard is established by an authority or by general consent as a model or example to be followed. These standards usually are developed reactively to address a safety concern. Nonregulatory groups and associations develop and publish standards. The group responsible for most fire service consensus standards is the National Fire Protection Association (NFPA).

The American Ambulance Association (AAA) currently is using consensus standards to certify ambulance companies. Although these certifications are not mandatory, the association is using them as a method of self-regulation.

Consensus standards usually are not mandatory, but the legal status of consensus standards varies from state to state. The standards are used extensively in litigation and, in the event of the lawsuit, you may be asked to defend a failure to follow a standard.

Consider reviewing the following NFPA standards for application to the role of the ISO: NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, and NFPA 1521, Standard for Fire Department Safety Officer. Non-fire department organizations also may want to review these standards because certain sections may apply to them.

Reason for These Laws, Regulations, and Standards

All laws, regulations, case law, and standards are designed with responder safety in mind. At times, it may seem that the procedures slow the responder at an emergency, but that is when the need for safety is most critical. As responders rush their actions, the chances of injury increase.

By following all the rules and regulations, the liability to both the responder and the agency is more easily managed. As an ISO, you have the task of ensuring that all responders act in a
safe manner. Since you may not know the responders personally, it is important to stress that the rules are there to protect them.

Uninjured responders remain available for other calls. This helps lessen the problems inherent in running without full complement of personnel. It is noticeably cheaper to run an organization that prevents injury. Paid departments avoid overtime payments, since responders are present for duty and their positions do not have to be backfilled. In volunteer organizations, there may be insurance premium reductions. In both cases, the psychological toll of treating injured fellow responders is lessened. The toll on responders who have to treat other responders with serious injuries is high. Additionally, the rate of injuries or seriously injured tends to increase after a fellow responder has been killed.

National Fire Protection Association (NFPA)

Since 1986, the National Fire Protection Association (NFPA) has been the leading nonprofit organization in the world dedicated to protecting lives and property from the hazards of fire. NFPA is noted for its involvement in fire prevention and education programs, and the standards making process. NFPA has developed several of the most well-known and widely used standards, such as the National Electrical Code and the Code for Safety to Life from Fire in Buildings and Structures. The NFPA publishes over 270 nationally recognized codes and standards.

In 1986 at the NFPA Annual Meeting in Cincinnati, Ohio, the NFPA membership passed NFPA 1500, Standard on Fire Department Occupational Safety and Health Program. This standard has affected the safety and health of the fire service as has no other. The NFPA Technical Committee on Fire Service Occupational Safety and Health is responsible for the development of several standards that address specific safety and health issues. The intent of the original technical committee was to expand each section of NFPA 1500 into its own document.
These standards are:

- NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*;
- NFPA 1521, *Standard for Fire Department Safety Officer*;
- NFPA 1561, *Standard for Fire Department Incident Management System*;
- NFPA 1581, *Standard for Fire Department Infection Control Program*; and
- NFPA 1582, *Standard on Medical Requirements for Fire Fighters*.

**NFPA 1500**

The NFPA Fire Service Occupational Safety and Health Technical Committee’s intent was to develop a user standard addressing various safety and health interests. NFPA 1500 serves as a voluntary consensus standard detailing the needed requirements of a complete fire department safety program. Once the Authority Having Jurisdiction (AHJ) adopts the standard, it becomes a mandatory standard. The authority having jurisdiction is defined as the “organization, office, or individual responsible for approving equipment, an installation, or a procedure.” NFPA 1500 meets or exceeds the criteria listed in Subpart L of the OSHA requirements.

It is the goal of the 1500 committee to expand each of the chapter topics into its own document. Incorporated into this standard are topics dealing with a wide range of safety and health interests. No other NFPA standard has addressed concerns such as this before.

NFPA 1500 chapters are:

- Chapter 1: Administration
NFPA 1500 contains the minimum requirements for a fire department occupational safety and health program. NFPA 1500 is intended to reduce the number and severity of accidents, injuries, and exposures. Another important issue is ensuring that all persons abide by this standard whether the person is a career, part-paid, or volunteer firefighter. The technical committee felt safety should incorporate any persons regardless of his or her affiliation. The term member is used throughout the standard to define a person involved with a fire department organization.
The NFPA 1500 regulates that a fire department organization should develop and maintain a written safety and health program. With this program, the organization must develop goals and objectives to prevent and eliminate accidents, occupational illnesses, and fatalities. A fire department HSO must be appointed and shall be responsible for the occupational safety and health program. The duties and responsibilities of the HSO are defined in NFPA 1521 Standard of Fire Department Safety Officer. The development and functions of an occupational safety committee will be to conduct research, develop recommendations, and study and review matters pertaining to occupational safety and health within the fire department.

The NFPA also publishes standards that address protective clothing and equipment; these are the manufacturer’s design criteria for protective clothing and equipment. As applicable clothing is ordered, the department should stipulate that they meet these specifications.

These standards address:

- Structural firefighting clothing and equipment, such as turnout coats, turnout pants, helmets, boots, and gloves;

- Protective equipment such as Self-Contained Breathing Apparatus (SCBA), Personal Alert Safety Systems (PASS), and rope;

- Protective clothing for personnel involved in wildland; hazardous materials; and crash, fire, and rescue operations; and

- Protective clothing for personnel engaged in emergency medical operations.

NFPA has design criteria for various types of fire apparatus and equipment, which include:
• Manufacture’s specifications for pumpers, aerial ladders and platforms, and tankers;

• Design specifications for hose, ground ladders, and nozzles; and

• The annual testing criteria for apparatus and equipment to ensure safety in operations.

NFPA technical committees develop professional qualifications and competency standards for firefighters, fire officers, driver/operators, and fire instructors.

In addition, training safety relating to live fire training, training centers, and training reporting procedures have been developed in NFPA Standard 1400 NFPA 1403, Standard on Live Fire Training Evolutions in Structure which was developed because of numerous firefighting fatalities during live fire training exercises.

American Society for Testing and Materials
The American Society for Testing and Materials (ASTM) is a private nonprofit organization that develops standards for materials, systems, products, and services. It was founded in 1898 to provide these services for a variety of disciplines.

Standards for emergency medical services are developed by ASTM’s Committee F-30, Emergency Medical Services including Standard Practice for Training the Emergency Medical Technician (Basic) (F-1031) and Standard Guide on Structures and Responsibilities of Emergency Medical Services Systems Organizations (F-1086).

ASTM D 3578, Standard Specification for Rubber Examination Gloves, 1991, includes requirements for sampling to ensure quality control, water tightness, testing for detecting holes in gloves, physical dimension testing to ensure proper fit of the gloves, and physical testing to ensure that the gloves do not tear easily.

**Regulations Issued by Federal Administrative Agencies**

**Regulation or Rule**

The U.S. Congress has created different Federal administrative agencies. These agencies issue regulations and orders that have as much authority as statutory laws. You have been affected by these rules but probably did not give it much thought. Have you ever noticed that all school buses are the same color? The Department of Transportation (DOT) is responsible for that. How about rules concerning airline safety? Airline rules and regulations come from the Federal Aviation Administration (FAA).

One agency of particular interest to emergency responders is the Occupational Safety and Health Administration (OSHA) because its rules govern worker safety. Agencies are fined for violations, but the penalties vary based on the infraction. The rules have the force of laws.

When responding to hazardous materials assignments, all emergency personnel must follow OSHA Title 29 Code of Federal Regulations (CFR) Part 1910 120, *Hazardous Waste Operations and Emergency Response* (HAZWOPER), which requires the presence of an ISO as part of the Incident Command System (ICS) at all hazardous materials assignments, and the development of a site specific safety plan, among other requirements.
Federal law requires that each state comply with OSHA regulations, or enact state laws that are at least as stringent. Federal OSHA regulations generally apply to private employers. In states that simply adopt the OSHA regulations, most emergency responders are not covered.

When it comes to hazardous materials response, however, all responders are covered under the Superfund Amendments and Reauthorization Act (SARA) of 1986. Section 126 requires the Environmental Protection Agency (EPA) to issue an identical set of regulations, covering anyone not covered by the OSHA rule.

Another OSHA rule is 29 CFR Part 1910 1030, *Occupational Exposure to Bloodborne Pathogens*. A written control plan and the use of Personal Protective Equipment (PPE) are mandated, along with record-keeping and post-exposure procedures.

Regulations are mandatory requirements issued by federal administrative agencies, such as the Occupational Safety and Health Administration (OSHA), which is a branch of the Department of Labor. OSHA was created in 1970 to provide written requirements for ensuring occupational safety and health standards for employees.

Under the Occupational Safety and Health Act of 1970, the Federal OSHA has no direct power to ensure that state and local governments comply with safety and health standards, such as the OSHA blood borne pathogens standard, for public employees. OSHA law does permit other methods to be used in order to provide maximum protection of public employees’ safety and health.

Twenty-three states and two territories have established and currently maintain an effective and comprehensive occupational safety and health program for public employees. These state plans must meet or exceed the requirements of Federal OSHA. OSHA gives a state plan six months from the publication date of a final standard to adopt a similar
standard. All fire departments, whether state, county, or municipal, in any of the states or territories that have an OSHA plan agreement in effect have the protection of the minimal acceptable safety and health standards mandated by federal OSHA.


**Statutory Laws**

Statutory laws are laws pertaining to civil and criminal matters, enacted by a body legally authorized to pass laws. These laws can be passed by several different elected bodies. For example, the U.S. Congress (House of Representatives and the Senate) passes what is called a bill. This bill is sent to the White House for the president’s signature. When the president signs the bill, it becomes a law. Federal laws have national impact.

The Ryan White Comprehensive AIDS Resources Emergency Act of 1990 (PL 101-381) is one Federal statutory law that affects all emergency responders. This law allows emergency response personnel to find out if they were exposed to an infectious disease while providing patient care. This law does not require mandatory patient testing for infectious diseases.

The Americans with Disabilities Act of 1990 (ADA) is another Federal law that affects how your agency operates. It is illegal to discriminate against someone based solely on that
person’s disability. Any pre-employment physical examinations must be based on the functions that the person will have to perform. For further information on this law and how it affects your agency, you can contact the local Anti-Discrimination Enforcement Agency.

Different local governing bodies can pass laws that are enforceable only in the areas of their jurisdiction, for example, your state government. It may enact laws that affect all people within the state, such as vehicle and traffic laws. The state legislature can set speed limits, the age of drivers, and requirements for a driver’s license. All of these laws would affect anyone within the state, as long as they do not conflict with a Federal law.

Examples of local laws that affect you are laws that pertain to proper disposal of biohazardous waste. These laws vary from state to state. Obtain a copy of your state’s laws for your own reference.

Laws in each state vary and research should be conducted to determine which laws affect you in the performance of your safety function.

**Case Law**

Case law differs from statutory law because it is derived from either legal precedent or judicial decisions in particular cases. Legal precedent can be defined as a judicial decision, form of proceeding, or course of action that serves as a rule for future determinations in similar analogous cases. In emergency services, these judicial decisions usually are based on a civil suit. These decisions affect responders by changing requirements or procedures rapidly, usually with little or no implementation time, unlike a statutory law that may not take effect for years.

Depending on the court in which the case is heard, the decision may be either nationwide or statewide in scope. Sometimes the decisions are reversed later by the same or a
different court. The case law of the country always is subject to change. Similar cases heard in different states’ courts can have opposite findings.

In *Whirlpool Corp v Marshall* (100 S CT 883, 1980) it was determined that an employee has the right to choose not to perform an assigned task because of reasonable apprehension that death or serious injury may result. Specifically this right is applicable where the worker believes there is no less drastic alternative to refusing to work. The courts in this case found for the worker and upheld this right. This is one case where a decision by a court can have an effect on emergency responders, although the case in question did not involve emergency responders.

It is important to research both Federal and state cases to determine which cases affect you. It would be appropriate to obtain research assistance from people with more legal experience than yours. You could canvas your organization’s membership to find any legal technical experts who could assist you.
Activity 5.2:
Laws, Standards, and Regulations
Student Activity Worksheet

Time: 30 minutes

Purpose:
To review actual laws, standards, and regulations and to compare them to written standard operating guidelines for proper content.

Directions:
1. Your instructor will divide the class into four small groups.

2. Your group will be assigned a law, standard, or regulation with accompanying guideline.

3. Based on the information in the law, standard, or regulation, you must identify the incorrect information in the guideline.

4. You will then identify the correct information that must be in the guideline.

5. Select a spokesperson to share your group’s findings with the class.

You will have 15 minutes in your group to discuss your findings and come to a consensus.
1910.120(c)(5) states:

“Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:

Based on the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry which will provide protection to a level of exposure below permissible exposure limits and published exposure levels for known or suspected hazardous substances and health hazards and which will provide protection against other known and suspected hazards identified during the preliminary site evaluation. If there is no permissible exposure limit or published exposure level, the employer may use other published studies and information as a guide to appropriate personal protective equipment.

If positive-pressure self-contained breathing apparatus is not used as part of the entry ensemble, and if respiratory protection is warranted by the potential hazards identified during the preliminary site evaluation, an escape self-contained breathing apparatus of at least five minutes’ duration shall be carried by employees during initial site entry.

If the preliminary site evaluation does not produce sufficient information to identify the hazards or suspected hazards on the site an ensemble providing equivalent to Level B PPE shall be provided as minimum protection, and direct reading instruments shall be used a appropriate for identifying IDLH conditions.

Once the hazards of the site have been identified, the appropriate PPE shall be selected and used in accordance with paragraph (g) of this section.”

ZYX Fire Department, Standard Operating Guideline: Personal Protective Equipment (PPE) for Hazardous Materials Incidents

Structural firefighting clothing (helmet, FR hood, coat, pants, boots, and gloves) is adequate personal protection equipment during all initial site entry involving hazardous substances.

Self-contained Breathing Apparatus (SCBA) is an option based upon the
recommendation from the officer in charge of the incident scene.

If the preliminary site evaluation does not produce sufficient information to identify the hazards or suspected hazards, structural firefighting clothing will be adequate protection for personnel.

Incorrect information:

Correction:
Notes:
NFPA 1500, Chapter 6: Fire Apparatus, Equipment, and Drivers/Operators states:

“6.1 Fire Department Apparatus.

6.1.1 The fire department shall consider safety and health as primary concerns in the specification, design, construction, acquisition, operation, maintenance, inspection, and repair of all fire department apparatus.

6.1.1.1 The fire department shall specify restraint devices or fire apparatus, including those restraint devices for emergency medical service (EMS) members operating in the patient compartment of the ambulance.

6.1.2 All new fire apparatus shall be specified and ordered to meet the applicable requirements of NFPA 1901, Standard for Automotive Fire Apparatus.

6.1.3 All new wildland fire apparatus shall be specified and ordered to meet the requirements of NFPA 1906, Standard for Wildland Fire Apparatus.

6.1.4 All fire marine fire-fighting vessels shall be specified and ordered to meet the requirements of NFPA 1925, Standard on Marine Fire-Fighting Vessels.

6.1.5 Where tools, equipment, or respiratory protection are carried within enclosed seating areas of fire apparatus or patient compartment of an ambulance, such items shall be secured by either a positive mechanical means of holding the item in its stowed position or in a compartment with a positive latching door.

6.1.6 When fire apparatus is refurbished, it shall be specified and ordered to meet the applicable requirements of NFPA 1912, Standard for Fire Apparatus Refurbishing.

6.1.7 Fire departments that operate their own fixed wing or rotary aircraft for fire department operations shall provide four-point restraints for all pilots and passengers, not including any EMS patients.

6.1.8 Members performing hoist rescue in the passenger area of the aircraft shall be secured by a safety harness or seat belt system.”
MEL Fire Department, Standard Operating Guideline: Tools and Equipment Carried on Apparatus

All tools and equipment such as:

- Halligan tool,
- Axes,
- SCBA,
- Fire extinguishers, and
- Pike poles

that are carried in the riding compartment of fire apparatus do not have to be secured or mounted, if the firefighter holds the tools or equipment, puts the tools/equipment under the seat, or puts his or her foot on the tools or equipment to hold them in place while the apparatus is moving.

Incorrect information:

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Correction:

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SM 5-44
Notes:
Group 3: 29 CFR 1910.1030, Occupational Exposure to Bloodborne Pathogens

1910.1030(d)(3) states:

“**Provision.** When there is occupational exposure, the employer shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection, and mouthpieces, resuscitation bags, pocket masks, or other ventilation devices. Personal protective equipment will be considered ‘appropriate’ only if it does not permit blood or other potentially infectious materials to pass through to or reach the employee’s work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

**Use.** The employer shall ensure that the employee uses appropriate personal protective equipment unless the employer shows that the employee temporarily and briefly declined to use personal protective equipment when, under rare and extraordinary circumstances, it was the employee’s professional judgment that in the specific instance its use would have prevented the delivery of health care or public safety services or would have posed an increased hazard to the safety of the worker or co-worker. When the employee makes this judgment, the circumstances shall be investigated and documented in order to determine whether changes can be instituted to prevent such occurrences in the future.

**Accessibility.** The employer shall ensure that appropriate personal protective equipment in the appropriate size is readily accessible at the worksite or is issued to employees. Hypoallergenic gloves, glove liners, powderless gloves, or other similar alternatives shall be readily accessible to those employees who are allergic to the gloves normally provided.

**Cleaning, Laundering, and Disposal.** The employer shall clean, launder, and dispose of personal protective equipment required by paragraphs (d) and (e) of this standard, at no cost to the employee.

**Repair and Replacement.** The employer shall repair or replace personal protective equipment as needed to maintain its effectiveness, at no cost to the employee.

If a garment(s) is penetrated by blood or other potentially infectious materials, the garment(s) shall be removed immediately or as soon as feasible.
All personal protective equipment shall be removed prior to leaving the work area.

When personal protective equipment is removed it shall be placed in an appropriately designated area or container for storage, washing, decontamination or disposal.

**Gloves.** Gloves shall be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and non-intact skin; when performing vascular access procedures except as specified in paragraph (d)(3)(ix)(D); and when handling or touching contaminated items or surfaces.

Disposable (single use) gloves such as surgical or examination gloves, shall be replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised.

Disposable (single use) gloves shall not be washed or decontaminated for re-use.

Utility gloves may be decontaminated for re-use if the integrity of the glove is not compromised. However, they must be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised.”

**KMR Fire Department, Standard Operating Guideline: Infection Control Personal Protective Equipment**

Disposable medical gloves shall be put on while responding to an emergency medical incident.

Disposable medical gloves can be removed and put back in your coat or pants pocket after an incident, if there is no patient contact during the incident.

Disposable medical gloves shall be removed once you return to quarters or the medical facility.
Incorrect information:

Correction:
Group 4: NFPA 1971, Standard on Protective Clothing for Structural Fire Fighting

NFPA 1971, Chapter 3: Labeling and Information, states:

“3-1 Product Label Requirements.

3-1.1 Each element of the protective ensemble shall have at least one product label permanently and conspicuously located inside each element when the element is properly assembled with all layers and components in place.

3-1.2 Multiple label pieces shall be permitted in order to carry all statements and information required to be on the product label. However, all label pieces comprising the product label shall be located adjacent to each other.

3-1.3 The certification organization’s label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label. All letters shall be at least 2.5mm (3/32 in.) high. The label, symbol, or identifying mark shall be at least 6mm (1/4 in.) in height and shall be placed in a conspicuous location.

3-1.4 All worded portions of the required product label shall be printed in at least English.

3-1.5 Symbols and other pictorial graphic representations shall be permitted to be used to supplement worded statements on the product label(s).

3-1.6 The following compliance statement shall be printed legibly on the product label. The appropriate term for the element type—garment, helmet, glove, footwear, hood—shall be inserted in the compliance statement text where indicated. All letters shall be at least 2.5mm (3/32 in.) in height.

“This (insert appropriate element term here) MEETS THE (insert appropriate element term here) REQUIREMENTS OF NFPA 1971, STANDARD ON PROTECTIVE ENSEMBLE FOR STRUCTURAL FIRE FIGHTING, 2000 EDITION.

DO NOT REMOVE THIS LABEL.”

3-1.7 The following information shall also be printed legibly on the product label with all letters at least 1.5mm (1/16 in.) in height:
(1) Manufacturer’s name, identification, or designation
(2) Manufacturer’s address
(3) Country of manufacture
(4) Manufacturer’s element identification number, lot number, or serial number
(5) Month and year of manufacture
(6) Model name, number, or design
(7) Size or size range
(8) Principle material(s) of construction
(9) Cleaning precautions.

DSB Fire Department, Standard Operating Guideline: Structural Firefighting Clothing

The garment label on structural firefighting clothing can be removed once this clothing has been issued to department personnel. The information on the garment labeling is for the manufacturer, not fire department personnel.

Incorrect information:
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**Standard Operating Guidelines**

Standard Operating Guidelines (SOGs) are written by a specific response organization to standardize a method or activity performed by members of the organization. SOGs affect only the organization that wrote them. They must conform to all applicable laws and regulations, for example, a response agency cannot have an SOG that directs members to operate in chemical protective clothing without a backup.

SOGs also should conform with any applicable standards that may address the same issues. The SOGs should cover all areas of activity in which your members take part.

**Influence and Effect of Laws, Standards, and Regulations on Department Operations**

NFPA 1500 is the only standard that comprehensively addresses the necessary components for a fire service occupational safety and health program. The importance of complying with this standard is indicated by the reduction in firefighting fatalities, reduction in the number and severity of accidents and injuries to members, and improved health maintenance and well being of firefighters. Compliance is a proactive approach to reducing risk of personnel and reducing liability to the department.

The primary responsibility of an employer is to provide a safe and healthy work environment. The tangible benefits are the reduction of risk to the employee and the decrease in liability for the department. Unfortunately, the fire service tends to confront these issues from a negative perspective. The positive considerations should be addressed, as well as how to improve the overall operations of the department by reducing risk to personnel and limiting or decreasing liability.

The fire chief has the ultimate responsibility for safety and health in the department. So that the process can be properly
managed, the fire chief appoints or designates an HSO to be the program manager of the safety and health program.

Ensuring compliance with all acceptable laws, standards, and regulations develops and promotes a positive image inside and outside the department. Complying with safety and health standards demonstrates a responsibility for safety and health on the part of all personnel. It sends a message that the organization cares about them and their well-being.

An organization that has effective operating procedures provides a more efficient and productive operation on a daily basis. Personnel are provided with the essential requirements to function in their assigned positions.

A department develops policies based on laws, standards, and regulations to provide the necessary information to establish procedures. For example, NFPA 1500 provides the necessary components to establish a comprehensive safety and health program. Before the development of NFPA 1500, no other law, standard, or regulation addressed safety and health needs for the fire service in such an inclusive manner.

Finally, the HSO must develop a network that provides information on laws, standards, and regulations. As they are revised or developed, the HSO can include this information in the department’s procedures.

**Development of Written Safety and Health Procedures**

As with any procedure, if a department expects all personnel to understand the department’s occupational safety and health program requirements, the program must be written. This written program will provide the necessary components for the department’s safety and health program. As part of the program, the duties and responsibilities of the HSO and OSH committee should be defined.

NFPA 1500, Chapter 4.3.1 states, “The fire department shall adopt an official written departmental occupational safety and
health policy that identifies specific goals and objectives for the prevention and elimination of accidents and occupational injuries, exposure to communicable disease, illnesses and fatalities.”

Chapter 4.3.2 states, “It shall be the policy of the fire department to seek and to provide an occupational safety and health program for its members that complies with this standard for its members.”

**Occupational Safety and Health (OSH) Committee**

If the OSH committee has the primary function of managing the safety and health program, the duties and responsibilities may be divided among the committee members. One member may be assigned to apparatus safety, another to training safety, and another member to facility safety until all the functions have been assigned. NFPA 1500 provides guidelines for the OSH committee.

**Periodic Review and Revision Process**

A department must have procedures in place to evaluate, review, and revise procedures routinely. The HSO and/or the OSH committee will be responsible for this process.

NFPA 1500 Chapter 4.3.3 states, “The fire department shall evaluate the effectiveness of the occupational safety and health program at least once every three years. An audit report of the findings shall be submitted to the fire chief and to the members of the occupational safety and health committee.” This audit should be conducted by a qualified individual from outside the fire department; outside evaluators provide a different perspective, which can be constructive.

The job functions and duties of the HSO or the OSH committee must be reviewed and revised routinely, based on new assignments or responsibilities. This determines if the HSO is concentrating on the primary functions of the position. If the HSO position is established, the OSH
committee still must function as a part of the department’s safety and health process.

Module Summary

The work of the HSO has a major effect on fire department emergency operations. His or her duties are primarily conducted in non-emergency situations.

In this module, we discussed:

- Health risk factors that affect firefighters both long-term and on the fireground and programs that departments have in place to address these risks;

- Firefighter wellness programs, including EAP and physical fitness programs;

- Record keeping and documentation; and

- Laws, standards, and regulations and how they affect safety on and off the fireground.

The HSO must:

- Know the laws, standards, and regulations;

- Understand how the laws, standards, and regulations are developed, and if possible, become involved as part of the development and revision process; and

- Be a positive influence on department operations.
MODULE 6

SLIDES
Chief Officer Training Curriculum

Operations
Module 6:
Incident Safety Officer (ISO)

Objectives
♦ Identify the duties of the ISO
♦ Determine pre-emergency risk management measures
♦ Determine immediate risks to emergency responders
♦ Forecast potential risks to emergency responders

Overview
In order for you to demonstrate the duties of an ISO, you will need to know the:
♦ ISO’s duties and responsibilities
♦ Characteristics of effective ISOs
♦ Relationship between the Health and Safety Officer (HSO) and the ISO
♦ ISO’s function in the ICS
♦ ISO’s role in risk management
Role of the ISO

- Responsible for safety at emergency scene
- Reports directly to the Incident Commander (IC)
- Almost all duties performed at scene—some follow-up

Role of the ISO (continued)

- Monitors and assesses safety hazards and unsafe situations
- Develops measures to ensure personnel safety
  - Ensures responders follow safe practices
  - Has knowledge of department safety concerns
  - Works with HSO
  - Acts as risk manager

ISO Basic Duties and Responsibilities

- Member of IC’s command staff
- Appointed by IC
- May be a designated ISO on-duty or on-call
- May be officer appointed at scene by IC
ISO Basic Duties and Responsibilities (continued)

IC appoints qualified individual as ISO:

- Knowledge of responsibilities
- Knowledge of type of incident

Ensures Safe Practices

- Wearing PPE/SCBA
- Wearing infection control PPE
- Working in teams
- Following accountability system

Has Knowledge of Safety Concerns

- Structural fire knowledge
- EMS knowledge
- Special operations knowledge
Risk Manager

- Minimizes threat of death or injury to responders
- Has goal to prevent rather than treat injuries
- Looks for and at preventive measures

Risk/Benefit Analysis

- Determine that risks are worth benefits
- Don't risk responders' lives and safety to rescue dead victims or to save property already destroyed

Examples of Measures

- SOGs being followed
- Proper PPE being used
- Rehab area established for responders
- Identify when responders need rehab
Develop an Incident Safety Plan

- Unwritten at smaller incidents
- Part of written IAP at large incidents

Document the Incident

- For Post-Incident Analysis (PIA)
- In event of injury or death of responder
- As part of department’s records

Response Criteria for ISO

An ISO may be required to be dispatched or appointed at:
- Working commercial fires
- Multiple-alarm fires
- Special operations responses
- Firefighter death at incident
- Firefighter injury
Effective ISOs

**Personal characteristics:**
- Communication skills
- Concern for health and safety
- Focus on safety
- Ability to make decisions

Effective ISOs (continued)

**Knowledge of duties:**
- Understand ISO's role in ICS
- Know SOGs
- Know laws and regulations
- Understand tactics
- Know documentation requirements

Effective ISOs (continued)

**Role model:**
- Follow all safety practices at incidents and during training
- Act as mentor and leader
Effective ISOs (continued)
- Recognize potential hazards at incident
- Identify and use safety cues

The HSO/ISO Relationship
- HSO's duties are nonemergency
- HSO can't be everywhere
- Responder safety is priority
- IC assigns ISO when needed
- HSO relies on ISO for contact after incident

Activity 6.1: Problem Identification
ISO’s Function in an ICS

- ISO works directly for IC
- Assists IC in addressing responder safety
- Understands IAP
- Communicates and coordinates with others in ICS
- Communicates and coordinates with other agencies related to safety

Activity 6.2: The ISO as Part of an ICS Organization
Pre-Emergency Risk Management

- Primarily focus of HSO
- Examples:
  - Driving regulations
  - PPE
- ISO must be familiar with measures

Fire Department Risk Management

- Plan required by NFPA 1500, Chapter 4.2
- Must be written, address all fire department operations, and use classic risk management
- Measures must be used in training
- NFPA 1403 is excellent tool

Activity 6.3: Pre-Emergency Risk Management
The ISO as Risk Manager

- Ensures use of pre-emergency risk management measures
- Monitors hazards

The ISO and the IC

- ISO is safety eyes and ears of IC
- ISO has direct access to IC
- Everyone has role in safety
ISO’s Duties at Emergency Scene

- Looks for risks that pose and immediate danger to responders
- Predicts developments that may place responders’ safety or lives at risk

Activity 6.4: Immediate Risk Identification
**Forecasting**

The ISO must:

- Get ahead of the emergency
- Use experience, training, safety cues, and intuition

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**Structural Fire Forecasting**

- Features of building
- Fire protection systems
- Access for fire crews
- Egress for crews
- Construction type
- Age of building

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**Structural Fire Forecasting (continued)**

- Potential for fire extension
- Amount of fire involvement
- Roof hazards
- Time
- IC’s tactical objectives
- Weather
Medical Emergency Forecasting

- Protection from communicable disease
- Protection from physical hazards
- Protection from violent acts
- Protection from surroundings
- Sufficient staffing

Rapid Intervention Crew (RIC)

NFPA 1500 requires specifically designated rescue teams at the incident scene.

RIC—Risk

Risk increased in area where ability of individuals to rescue themselves is reduced by distance they would have to travel:

- Large building
- Basement or an upper floor
- Hold of a ship
- High-rise building
- Potential collapse situation
RIC—Risk (continued)

Risk increased by nature of task:

♦ Hazardous materials spill
♦ Below-ground rescue

RIC—Composition and Placement

♦ RICs:
  – Are agency-specific
  – Require written procedures/guidelines
  – Require minimum of two members, fully equipped with appropriate clothing, SCBAs, and necessary tools
♦ In haz mat, entry team leader ensures a RIC

Activity 6.5: Forecasting
Risks for Responders

Methods to minimize risk:

- Follow SOGs
- Train and practice
- Use PPE
- Have an ISO
Unacceptable Risk

- When is a risk unacceptable?
  - Gunfire or other extreme hazard
  - Interior attack on unoccupied building
- Fine line between acceptable and unacceptable
- Bad information or lack of information can complicate matters

Permitting Unsafe Operations

- IC may judge risk to be worthwhile
- IC may not be aware of all hazards
- ISO may choose to inform IC of hazard or terminate unsafe operation

Terminating Unsafe Operations

The ISO’s role:
- NFPA 1521, *Standard for Fire Department Safety Officer*, Paragraph 2.3.3
- ISO has the authority to alter, suspend, or terminate an operation or any part thereof

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COTC: Operations
Module 6: Incident Safety Officer
Proper communication between the ISO and the IC will assure that the ISO's concerns are heard and that a competitive situation between the ISO and the IC does not become a problem.

Terminate Operations

- Assess impact of termination on rest of incident
- Responders in another part of operation may be endangered by termination

Suspend Operations

- If situation permits, suspend operation and meet with IC
- Responders in another part of operation may be endangered by termination
Alter Operations

- ISO may alter operation
- Shift from offensive to defensive strategy may be appropriate

Relay Decisions

- Immediately inform IC of your action
- If time permits, ISO must choose to consult with IC before any action

Module Summary

The ISO:
- Is on-scene risk manager
- Uses agency risk management plan
- Is responsible for scene safety
- Determines immediate risks and forecasts risks
- Has authority to alter, suspend, or terminate unsafe operations
MODULE 6

INCIDENT SAFETY OFFICER AND RISK MANAGEMENT
MODULE 6:

INCIDENT SAFETY OFFICER (ISO) AND RISK MANAGEMENT

Objective
Upon completing the module, you will be able to demonstrate the duties of an ISO.

Methodology
This module uses lecture, discussion, and activities.

NFPA 1021 Standards Cross-Reference Matrix

3-7, 4-7
Introduction

By the nature of the duties they perform, emergency responders are at risk of death, injury, or illness. Incident safety should be a primary concern of all those who respond to the aid of the community or jurisdiction they serve. To help minimize the risk to responders, one of the ways the Incident Command System (ICS) provides for responder safety is by giving the Incident Commander (IC) the ability to appoint and use an Incident Safety Officer (ISO). This position is a member of the ICS organization’s command staff. While the IC has overall responsibility for the safety of the responders, the ISO has the direct responsibility to focus on the safety aspects of the incident.

Role of the Incident Safety Officer (ISO)

Definition: The ISO monitors and assesses safety hazards or unsafe situations and develops measures for ensuring personnel safety.

The National Fire Protection Association (NFPA) has developed a national consensus standard outlining the duties and responsibilities of the ISO. NFPA 1521, Standard for Fire Department Safety Officer, covers health, safety, and wellness program management duties as well as the responsibilities of the ISO during an emergency incident.

Both the NFPA standard and the ICS Safety Officer description give the ISO the authority to alter, suspend, or terminate unsafe acts or hazardous activities. This makes the ISO position unique within the ICS organization. While the ICS typically follows along the chain of command, the ISO can bypass the system to correct unsafe actions or remove responders from the threat of immediate danger. An example would be removing firefighters from the interior of a structure that has the potential of imminent collapse. Another example is to remove responders from the area of an overturned vehicle that has not been properly shored to prevent it from rolling over onto them. Whenever the ISO takes action to
remove responders from the threat of danger. The ISO must advise their immediate supervisor and the IC as to what action was taken and why he or she made the determination.

In addition to correcting unsafe acts and hazardous activities, the ISO is responsible for identifying existing or potential hazards that do not present an imminent threat to responders. Communicating these hazards to the IC will allow the action plan to address the hazards. This communication will help the IC anticipate modifications that may need to be made to the plan.

**Basic Duties and Responsibilities of the ISO**

The primary responsibility of the ISO at every incident is to protect the safety of the responders. The ISO should ensure that responders follow safe practices. The ISO can do this in a variety of ways. Some examples are to see that the responders:

- Wear full Personal Protective Equipment (PPE);
- Work in teams in hazardous areas;
- Have backup personnel available to react to an unexpected event quickly;
- Use an accountability system to track personnel;
- Follow departmental and recognized safety practices; and
- Follow safe practices during training exercises.

**Knowledge of Typical Response Incidents**

It is important that the ISO has the requisite knowledge to function effectively at incidents. The ISO must have the knowledge to understand the hazards inherent at a typical incident response. Examples of the knowledge required are:
• Structural fire:
  * Building construction,
  * Fire behavior,
  * Flame spread,
  * Limits to how long firefighters can operate with Self-Contained Breathing Apparatus (SCBA), and
  * Limits to time responders can work before needing rehab, whether SCBA is used or not.

• EMS response:
  * Infection control procedures,
  * Scene security measures,
  * Use of PPE, and
  * Critical incident stress management.

• Special operations knowledge:
  * Safety lines staffed at a water rescue,
  * Proper shoring at a trench rescue,
  * Approved lifelines at a high-angle rescue,
  * Product identification at haz mat incident, and
  * Use of technical experts.
Job Functions
Without having the requisite knowledge, the ISO could endanger the safety of personnel through the inability to recognize when the responders might be at risk. The ISO must:

- Develop specifications for protective clothing;
- Assess the structural safety of a building that is on fire;
- Attend a safety committee meeting;
- Provide safety instruction to new firefighters;
- Monitor the safety of firefighters engaged in a hazardous materials incident;
- Attend a critique or a Post-Incident Analysis (PIA) of a fire or other emergency incident;
- Conduct the investigation of a collision involving fire apparatus;
- Order firefighters to leave an unsafe area;
- Perform a safety audit of a fire department program or facility; and
- Review a procedure to ensure that firefighter safety is addressed.

Response Criteria for the ISO
Each emergency response agency should have a written policy that outlines the response criteria for an ISO. An ISO is not needed at every incident; the use of an ISO should be reserved for more significant incidents.
The use of an ISO is recommended at working structural fires in commercial buildings; multicasualty incidents; all multiple-alarm fires; and all special operations incidents such as trench rescues, water rescues, hazardous materials incidents, and high-angle rescues. The use of an ISO is required by Federal law at all hazardous materials incidents. The use of an ISO is also strongly recommended for incidents that involve multiple responder injuries or an incident involving the death of a responder.

The existence of a written policy will assist ICs who may have to appoint an ISO, and it also will assist on-duty ISOs (if any) with the decision of whether to respond, or to monitor, a call.

**Characteristics of an Effective ISO**

**Personal Characteristics**

There are some personal characteristics an ISO should possess. Like most positions in life, effective communications skills are essential. The ISO must be an active listener and be able to understand what others are saying and how their message may relate to incident safety. The ISO also must be able to convey messages in a clear and concise manner. The information the ISO is likely to impart can be critical to protecting responder safety, and should be delivered in a clear manner others can understand.

There are times when the ISO may need to deliver a message the responders do not want to hear. Telling firefighters to get out of a building or a paramedic to glove up may not be well received. The firefighters may feel “just a couple more minutes” and they can get the fire out. The paramedic may say, “Let me get this line started first.” The ability to convey messages in a positive manner that convinces the responders that their safety is an issue may require above-average communication skills.
Another personal characteristic of an effective ISO is to have a genuine concern for the safety of those operating at the incident. The ISO needs to understand that his or her role is to protect responders. While the ISO may be enforcing safe practices and procedures, the reason for doing so is to ensure responder safety, not because the ISO’s job is to act as the incident bully.

The ISO must have the ability to focus on safety issues. There may be the urge to become involved in the tactical operations in addition to fulfilling the functions of the ISO. As safety is such a high priority at an incident, the ISO needs to concentrate his or her full attention on safety and leave the operations to the other responders.

The ISO may need to make quick decisions during times of high stress. An understanding of the incident and the operations being carried out will help the ISO make good decisions. The ability to make those decisions in a decisive and confident manner is a characteristic the ISO must have to be able to react quickly enough to keep the responders out of harm’s way.

**Knowledge of Duties**

If operating within a departmental or agency ICS organization, the ISO must have a clear understanding of how the position fits in the incident organization. How to function as part of the IC’s command staff, with whom to communicate and coordinate, and what specific job responsibilities are described in the agency’s ICS are duties the ISO needs to be trained in and to understand.

A thorough knowledge of the department’s or agency’s SOGs and any applicable laws, standards, or regulations also should be part of the ISO’s background. Through knowledge of the SOGs and because of training on tactical operations, the ISO should be able to recognize when the responders are using safe operational practices and procedures and when they are not.
Knowledge of Documentation Requirements

Documentation of the safety aspects of an incident is something the department or agency may require as part of the record keeping associated with the incident report. Should an injury or death occur because of the response, there are documentation requirements to be met. Just what documentation will be required will vary from state to state, but the ISO must be aware of the requirements before the incident. A lack of knowledge concerning documentation requirements may cause loss of valuable information concerning the incident. This could result in loss of benefits to responders or their families or problems with litigation arising from the incident.

Act as a Role Model

If the ISO expects others to follow safe practices and procedures, he or she must set the example. The example should be established during training exercises and carry over to the incident scene. Safety is not something that starts with the response but must be an attitude that translates into forming safe habits. The ISO can be a role model and a mentor to others. He or she can demonstrate positive leadership in creating such habits.

Recognize Safety Cues

The incident will present indicators that the ISO can use to recognize potential hazards. Smoke puffing through the mortar of a brick building or a sagging roof may be indicators of building collapse. A gunshot incident at which no one knows where the gun or the shooter might be should alert responders to be cautious as should hastily established shoring at a trench rescue that is starting to bow. These examples are of safety cues that the ISO can detect and take corrective action on or modify the action plan accordingly.

In addition to the ISO’s training and experience, he or she can develop skills in recognizing these safety cues based on what
he or she has observed and learned from similar incidents. Familiarity with the department’s or agency’s day-to-day tactical operations will give the ISO the ability to recognize when the operations are different from those typically performed and to determine if the differences are affecting safety adversely. Knowledge of any special operations that may be performed will allow the ISO to catch the safety cues that may be present. Knowing the level of training and experience of the responders will give the ISO a cue as to whether they are operating beyond their level of capability and possibly jeopardizing their safety.

Specialized Knowledge and Skills
To be as effective as possible, the ISO should have a thorough knowledge of the dangers and hazards the incident may present. It is not reasonable to expect an individual to have a detailed knowledge of the inherent dangers at every type of emergency incident. The ISO should be able to recognize his or her personal limitations and not attempt to function in areas in which he or she is not knowledgeable.

For those incidents requiring specialized knowledge or skills, the ISO may need to seek assistance from someone who has the practical or technical expertise to deal with the emergency properly. This may be true particularly in some special operations that involve a number of agencies. A haz mat incident that results in multiple victims, a leaking product, and a large-scale evacuation can present a multitude of problems for law enforcement, EMS, fire, public works, and number of other agencies. Having technical assistance to give an indication of the safety concerns to be addressed can have a significant positive impact on the safety of both the responders and the members of the community involved.

At large-scale incidents or those covering a large area, it may not be practical for the ISO to handle all of the responsibilities. It may be necessary, due to incident complexity, for the ISO to appoint others to assist in carrying out the duties. The ISO should assign specific areas of
responsibility to ensure that all safety aspects of the incident are covered. It is important for the ISO to maintain an effective span-of-control and not get so overloaded that safety is jeopardized.

The Relationship of the Health and Safety Officer (HSO) and the ISO

The duties of the HSO and the ISO are similar in that they both focus on firefighter safety. The primary difference between the HSO and the ISO is the setting for their work. The work of the HSO generally is pre-emergency or nonemergency in nature and the work of the ISO most often is performed at the scene of an emergency.

If the HSO performs safety duties at the scene of an emergency, he or she is referred to as the ISO. The HSO is a single individual who usually is appointed by the fire chief to focus on responder safety. Since there is only one HSO, he or she cannot possibly be available to respond to every emergency incident and perform as the ISO, yet the safety of responders must be addressed at every incident. If the HSO is unavailable to act as the ISO, the IC will appoint another member of the agency to perform the functions of the ISO.

In some very large agencies, on-duty ISOs may be assigned. For most agencies, the ISO may be any member of the agency who is assigned at the scene of the emergency.

The ISO performs a set of standard tasks on the emergency scene. If an ISO is assigned other than the HSO, the same tasks still must be performed. The HSO should ensure that other members of the agency are trained to a level that allows them to perform as an ISO.

In situations where the IC appoints someone other than the HSO to perform ISO duties, the HSO and the responders working on the scene of the emergency depend on the ISO to monitor safety. After the conclusion of the incident, the ISO should inform the HSO of any unusual problems or situations
encountered at the emergency scene. The HSO can use this information to develop additional safety procedures, for example, revise existing safety procedures, or address other problems (for example, through the use of protective clothing and equipment).

At complex or large emergencies, there may be more than one ISO working to monitor the safety of responders. If the ISO needs assistance in monitoring the safety of responders, he or she should request assistance from the IC.
Activity 6.1:
Problem Identification
Student Activity Worksheet

Time: 20 minutes

Purpose:
To recognize safe and unsafe practices at a variety of emergency incidents.

Directions:
1. Your instructor will show you a series of slides. After briefly viewing the slides, you are to identify and note in the spaces provided below both the safe and the unsafe practices you observe on each slide.

2. Your instructor may call on you to discuss your observations with the class.

Slide 1: Vehicle fire

Safe practices:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Unsafe practices:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Slide 2: EMS incident—vehicle accident

Safe practices:

Unsafe practices:

Slide 3: Dumpster fire

Safe practices:

Unsafe practices:
Slide 4: Hazardous materials incident
Safe practices:


Unsafe practices:


Slide 5: Structure fire
Safe practices:


Unsafe practices:


The ISO’s Function in an ICS organization

Incident Scene Accountability

All officers holding positions within the command organization are responsible for the welfare and accurate accountability of all assigned firefighters. Several fireground accountability systems have been developed by various fire departments around the country. While these may vary in overall design, there are common elements of personal accountability that fire departments should apply at emergency incidents to fully account for their personnel.

These common elements are:

- Required use;
- Hardware—nametags/documentation;
- Point of entry, control of nametags;
- Accountability officers;
- Benchmarks for required roll calls throughout operations;
- Plans for describing the command organization response to reports of lost firefighters; and
- Use of Rapid Intervention Crews (RICs).

Whatever the design, the system must be able to locate every firefighter within a small geographic work area, within the hazard zone, at any moment in time. Further, the system must be able to determine if a firefighter is delayed from an assignment, initiate an immediate rescue effort, if indicated, and fully integrate into the ICS. All fire departments are strongly encouraged to develop and implement a workable accountability system for their departments. The final product should be compatible with metro-area or regional accountability systems.
When the ISO is functioning within a formal ICS organization, he or she is part of the IC’s command staff and reports directly to the IC. He or she should get a briefing from the IC and determine what safety concerns already are addressed in the IC’s action plan. It is the ISO’s responsibility to monitor those concerns and advise the IC of any additional dangers or hazards present.

Although the IC has the overall responsibility for safety at the incident, the ISO has direct responsibility to aid the IC by focusing solely on the safety of the responders. The ISO should keep the IC updated on the conditions and should recommend any modifications to the action plan that will address safety issues.

While the ISO may report directly to the IC, lines of communication must be established with others operating as part of the ICS organization. To get a thorough understanding of the tactical operations, the ISO will likely need to communicate and coordinate with the division/group supervisors as well as others. These others could be the operations chief, medical unit leader, the rehabilitation manager, and other agencies involved in the tactical operations.

As part of the ICS organization and the IC’s command staff, the ISO needs to understand the IC’s action plan and enforce the safety portion of the plan. The ISO does this by first displaying a concern for responder safety. The actions the ISO takes to display that concern may include enforcing SOGs and recognized safe practices.

Along with accepting the role of ISO, the individual who fills the position also must accept the responsibility the IC has delegated for providing for the safety of the responders. It is not a responsibility to be taken lightly. It requires knowledge, personal, and professional skills, and a strong commitment to provide for the safety of the responders.
Activity 6.2:  
ISO as Part of an ICS Organization  
Student Activity Worksheet

Time: 30 minutes

Purpose:
To identify how an ISO functions within an ICS organization and with whom the ISO needs to communicate and coordinate at an incident.

Directions:
1. Your group will be assigned one of four questions regarding the ISO’s role or responsibilities at the following incident.
2. Select one member of your group to be your spokesperson to report your response to the class.
3. Outline your response to the question on an easel pad.

Scenario

Time: 0715 hours, Tuesday.

Weather: Light rain, 42°F, wind from the north at 10 to 15 mph.

Situation:
Emergency response units are dispatched to a report of an overturned truck involving injuries. The first-arriving units find a large tank truck on its side, leaking product from the dome covers. Product is running down the gutter and into the storm drainage system. The driver is lying on the street next to the truck and appears to be unconscious. A power pole was hit by the truck, and power lines are down in the street. The scene of the crash is adjacent to a residential area of single- and multifamily residences. The tank is placarded with the number 1307. The product is identified as being xylene. The Department of Transportation (DOT) North American Emergency Response Guidebook (NAERG) refers the product to Guide #130. The police officer who was first on the scene is
complaining of nausea. Residents in the homes immediately next to the crash also are complaining of nausea.

Resources initially dispatched to the incident:

- Two city police department patrol officers
- One ALS ambulance with two paramedics
- One fire department engine with three firefighters and an officer

Questions:
1. What are the immediate safety hazards you feel need to be addressed at this incident?
2. What recommendations would you make to the IC to address safety in the IAP?
3. What additional resources do you feel will be required to improve the level of safety at this incident, and why would they be needed?
4. In addition to the current hazards at this incident, what additional safety hazards do you feel may need to be addressed as the incident progresses?

Notes:
FIRE OR EXPLOSION

HIGHLY FLAMMABLE:
- Will be easily ignited by heat, sparks, or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (for example, sewers, basements, and tanks).
- Vapor explosion hazard indoors, outdoors, or in sewers.
- Some may Polymerize (P) explosively when heated or involved in a fire.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Many liquids are lighter than water.

Health
- May cause toxic effects if inhaled or absorbed through skin.
- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire will produce irritating, corrosive, and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

Public Safety
- CALL emergency response telephone number on shipping paper first. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Isolate spill or leak area immediately for at least 50 to 100 meters (160 to 330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Keep out of low areas.
- Ventilate closed spaces before entering.
Protective Clothing

- Wear positive-pressure Self-Contained Breathing Apparatus (SCBA).
- Structural firefighters’ protective clothing will only provide limited protection.

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 300 meters (1000 feet).

Fire

- If tank, rail car, or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

EMERGENCY RESPONSE

Fire

- CAUTION: All these products have a very low flash point: Use of water spray when fighting fire may be inefficient.

Small Fires

- Dry chemical, CO₂, water spray, or regular foam.

Large Fires

- Water spray, fog, or regular foam.
- Do not use straight streams.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
• ALWAYS stay away from the ends of tanks.
• For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

• ELIMINATE all ignition sources (no smoking, flares, sparks, or flames in immediate area).
• All equipment used when handling the product must be grounded.
• Do not touch or walk through spilled material.
• Stop leak if you can do it without risk.
• Prevent entry into waterways, sewers, basements, or confined areas.
• A vapor suppressing foam may be used to reduce vapors.
• Absorb or cover with dry earth, sand, or other noncombustible material and transfer to containers.
• Use clean nonsparking tools to collect absorbed material.

Large Spills

• Dike far ahead of liquid spill for later disposal.
• Water spray may reduce vapor; but may not prevent ignition in closed spaces.

First Aid

• Move victim to fresh air.
• Call emergency medical care.
• Apply artificial respiration if victim is not breathing.
• Administer oxygen if breathing is difficult.
• Remove and isolate contaminated clothing and shoes.
• In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
• Wash skin with soap and water.
• Keep victim warm and quiet.
• Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.
• Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.
Risk Management

Each of us faces risks every day. Every action that we take carries with it the chance that we might be killed or injured. It has an impact on us as we work and as we play; there is no way to escape risk completely. No activity is totally without risk.

In most cases, the risks that we take are very minor. The risk of being hit by lightning is very low, yet few of us are comfortable in an open field during an electrical storm. Likewise, the risk of crashing in a commercial airliner is minor, but it is always on everyone’s mind during take-off and landing.

Insurance companies are very familiar with the concept of risk. Car insurance premiums for an 18-year-old single male are much higher than they are for the same man once he is married and 30 years old, provided he has not had any major losses. The cost of the insurance reflects the risk that is associated with the driving behavior of the same person at different times in his or her life. We each face risks in our lives both at and away from work every day. Sometimes we do not think about the risks that we face, but they are still here.

As each of us live out lives, we avoid risk. Sometimes we think about avoiding it, and sometimes we just do it without thinking about it. If you choose not to enjoy the thrill of hang gliding because you feel that it is too risky, you have completely avoided the risk. However, not every risk can be avoided completely. In other cases, we can avoid a significant risk but not be completely protected from it. If the law enforcement agencies in your area begin referring to a stretch of road as the “mile of death,” you may choose to use another road during your travels. There is still some risk associated with driving on any road, so you have not completely avoided the risk. Because of the significant risks faced by emergency responders, attempts are made to identify and control the risks
that we face as we do our jobs. This activity is known as risk management.

Think about the risks faced by individuals involved in the following situations:

- Driving a car,
- Riding on a bus,
- Spending the night in a high-rise hotel,
- Bungee jumping,
- Attacking a car fire,
- Treating the injuries of someone who was trapped in a vehicle collision, or
- Performing an interior attack on a structural fire.

Risk management is the method used to reduce exposure to risks. As stated earlier, many risks cannot be completely avoided. Firefighting, emergency medical care, and special operations are extremely hazardous activities.

Risk management is a tool used in every industry to control risks. The best way to deal with any specific risk is to avoid it completely. In many situations, this is not possible, so other strategies for dealing with it must be developed.

Risk management for early response organizations is divided into three categories: nonemergency risk management, pre-emergency risk management, and risk management at emergencies.

**Nonemergency Risk Management**

Nonemergency risk management looks at the hazards common to all workplaces. This type of risk management
might include fire inspections of fire stations and the management offices of emergency response organizations. The risks encountered in these places are no less deadly than those encountered on the emergency scene, but their frequency and severity are lower than those risks faced on the emergency scene.

**Pre-Emergency Risk Management**

Pre-emergency risk management consists of activities that take place before the emergency. These activities can have a major impact on the safety of members working at the scene of an emergency.

Pre-emergency risk management is the responsibility primarily of the fire department HSO, although the ISO must know the techniques used as the products of this type of risk management.

**Fire Department Risk Management**

The National Fire Protection Association (NFPA) 1500, *Standard on Fire Department Occupational Safety and Health Program*, requires that all fire departments develop and adopt an official written risk management plan. The plan is required to cover all fire department facilities and operations. It uses the classic risk management methods described above. A risk management plan is a major undertaking, but it can be broken into many small tasks to make the work more manageable.

**Training Exercises**

Some of the most dangerous nonemergency activities that responders can perform are live fire training for special operations, such as hazardous materials emergencies or high-angle rescue. Risks at these training exercises mirror the risks in emergency operations. The ISO should apply the same risk management techniques used at emergencies to these events.
NFPA 1403, *Standard on Live Fire Training Evolutions*, provides safety and operational guidance for live structural fire training and should be used as a guide for the ISO.
Activity 6.3:
Pre-Emergency Risk Management
Student Activity Worksheet

Time: 15 minutes

Purpose:
To identify pre-emergency risk management measures that have an impact on emergency operations.

Directions:
1. Your instructor will show you a series of slides. After briefly viewing the slides, you are to identify and note in the spaces provided the pre-emergency risk management measures in the photograph as well as correct and incorrect safety behaviors and actions.

2. Your instructor may call on you to discuss your observations with the class.
Slide 1: Accident at an intersection

Pre-emergency risk factors:

Correct safety behaviors and actions:

Incorrect safety behaviors and actions:
Slide 2: Building fire

Pre-emergency risk factors:

Correct safety behaviors and actions:

Incorrect safety behaviors and actions:
Slide 3: Firefighters involved in vehicle extrication

Pre-emergency risk factors:


Correct safety behaviors and actions:


Incorrect safety behaviors and actions:


Slide 4: EMS scene, firefighters treating patient

Pre-emergency risk factors:

Correct safety behaviors and actions:

Incorrect safety behaviors and actions:
Risk Management at Emergencies

In contrast to the studied approach of pre-emergency risk management, risk management at emergencies is a constantly changing, fast paced activity. While the HSO is the risk manager for all pre-emergency risk management measures, emergency risk management is the primary job of the ISO. Safety cues will assist the ISO.

Classic Risk Management

Classic risk management is used before, during, or after the emergency. It is divided into five steps. It is used most often before the emergency to manage risks that are present in emergency situations.

Risk Identification

Risk evaluation is the process of making a list of things that might go wrong with an operation. A good rule of thumb is to anticipate the worst that can happen when identifying risks. If plans are formulated for worst-case scenarios, anything less can be handled. Sources for this information may include past department accident and injury statistics, input from members of the department, and knowledge of the experiences of other emergency service providers.

Risk Evaluation

Once the risks are identified, they can be evaluated both from a frequency and severity standpoint. Frequency is the likelihood that a risk will be faced. Some risks are present at every emergency and some may be faced only once every two years. Severity is an indication of how much damage or injury can be caused by the risk. Risks do not go away by themselves. If your agency has experienced an injury or death in a particular situation and no means to manage the risk have been put in place, your agency runs the risk of experiencing the same injury or death again. Using the information
gathered in the identification step, the risks can be classified by severity.

Establishing Priorities

When considered together, the frequency and severity information will help establish priorities for action. Any risk that has a high likelihood of happening (frequency) and has a great potential for damage and injury (severity) should be handled first. On the other hand, risks that have a low likelihood of happening and have a low potential for damage and injury would be lower on the priority list.

Each risk should be placed in one of the four areas. For example, a severe risk that is faced all of the time would appear in the upper-right box, and a risk that is not severe and faced infrequently would be placed in the box in the lower-left corner. In general, high-frequency, high-severity risks would be addressed first, and low-frequency, low-severity risks would be addressed later.

The prioritization process is not a simple task. There is no one correct priority for each risk. The decision about which risk to handle first depends upon local factors such as the availability of resources, the ease of addressing each risk, and the time involved in addressing each risk. See Figure 6-1, Prioritizing Risks, on the following page.
Risk Monitoring

Once control measures are in place, the effectiveness of the control measures must be monitored. In the case of the SOG that requires full stops, if emergency vehicles continue to be involved in collisions at intersections, the value of the SOG and the success of its implementation would need to be addressed.

Risk Control

Once all of the risks pertaining to an operation have been identified, it is time to attempt to find solutions to each risk. Some risks, especially those that occur during emergencies, cannot be completely controlled, but the severity of the risk can be addressed. For example, there is no way for the fire department to control the strength of a structure as the fire department arrives on the scene. The department does have
control over the severity of the risk through measures such as controlling access to the area where the structure will fall by implementing other Standard Operating Guidelines (SOGs) that dictate when it is permissible to enter a burning building.

There are several methods used in controlling risks. They are risk avoidance, risk control, and risk transfer.

**Risk Avoidance**—This method of risk management is of little value in protecting emergency responders from the risks on the emergency scene. This method involves the complete avoidance of a particular risk. If a bridge in a community is hazardous, the risk avoidance method would not allow fire apparatus or other emergency vehicles to use the bridge. Thus, the risk from the bridge is completely avoided. The safety of the alternate routes would need to be considered.

This method is of little use in emergency operations. If emergency responders avoided the emergency, who would provide the medical and fire control services needed at the scene? Emergency services organizations use the next risk management method, risk control, to address risks on the emergency scene.

**Risk Control**—This is the most visible type of risk management. Control measures include Personal Protective Equipment (PPE) and the use of SOGs, such as the use of an incident management system. The risks to emergency responders are identified before the emergency, and control measures that will have an impact on the safety of responders when the emergency occurs are put in place.

Collisions between emergency response vehicles at intersections is a risk that has high severity and high frequency in the emergency services. The development of SOGs that require a full stop at red lights and other negative right-of-way situations can help to control the severity and frequency if this risk.
Risk Transfer—This method involves transferring a risk to another organization or, in the case of a financial risk only, to insurance. If an emergency response organization concluded that inspections of gasoline tankers were just too risky to be performed by their members, the organization could contract an outside agency to perform the inspections. Thus, the risk is transferred from the emergency organization to an outside organization.

In cases where the risk is purely financial, such as risk of a fire in an unoccupied building owned by an emergency response organization, insurance can be purchased which protects the emergency response organization from the risk. It should be noted that risk transfer does not eliminate the risk or reduce the chances of fire, it only provides compensation of something goes wrong.

The ISO’s Role in Emergency Risk Management

The ISO’s first task as the risk manager for emergency scenes is to ensure that all pre-emergency risk management measures are in use and are followed by responders on the scene of the emergency. PPE and infection control equipment are of no value unless they are used at the emergency.

The ISO should actively survey the emergency scene and make sure that all members engaged in operations are properly protected. Other pre-emergency risk management measures, such as use of cold, warm, and hot zones for hazardous materials emergencies, also must be in place.

The ISO must watch constantly to make sure that safety equipment is in place and that safety procedures are being followed. Emergencies are dynamic events, so the ISO must monitor the emergency scene continually. A scene that is safe at one moment may not be safe 30 minutes later.
The ISO and the IC

The IC of an emergency has overall responsibility for the safety of responders working at an emergency scene. That responsibility cannot be delegated. The ISO assists the IC with safety and acts as the IC’s eyes and ears on matters related to responder safety.

The ISO reports directly to the IC as a part of an ICS. This direct access to the IC allows the ISO to transmit his or her information directly to the IC without fear that the message will be scrambled in transmission. This position reflects the importance of the ISO’s role at the emergency scene.

Figure 6-2: ICS Organizational Chart

Every responder at the scene of the emergency has a safety responsibility. Every individual member has a duty to be safe, to watch out for the safety of other responders at the scene, and to cooperate with safety procedures. The IC depends on the ISO to monitor the safety of the scene; this responsibility may require the ISO to issue corrective instructions to responders at the emergency scene.
The ISO’s Duties at the Emergency Scene

The ISO must look for risks of immediate danger to responders as well as continuously evaluate the emergency scene for risks that may present danger in the near future and take the appropriate action to reduce those risks.
Activity 6.4:
Immediate Risk Identification
Student Activity Worksheet

Time: 15 minutes

Purpose:
To identify immediate risks to emergency responders.

Directions:
1. Your instructor will show you a series of slides. After briefly viewing the slides, you are to identify and note in the spaces provided the immediate risks to the responders shown in the photograph.

2. Your instructor may call on you to discuss your observations with the class.
Slide 1: Firefighters treating a shooting victim

Immediate risks to emergency responders:

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________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Slide 2: Car fire at a restaurant drive-thru

Immediate risks to emergency responders:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Slide 3: Tar tanker fire, overhaul

Immediate risks to emergency responders:

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

Slide 4: Wildland fire

Immediate risks to emergency responders:

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________
Slide 5: Rowhouse fire

Immediate risks to emergency responders:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Slide 6: Firefighters venting roof

Immediate risks to emergency responders:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Forecasting

Given the fact that emergency scenes are dangerous places where situations change rapidly, the ISO must monitor the safety of responders constantly. The ISO must be concerned not only with hazards or risks that present an immediate danger to responders but also must forecast the future of the emergency as it relates to responder safety.

No member of the emergency services, not even the ISO, has a crystal ball that can be used to predict the future with 100 percent accuracy. The ISO must use his or her experience, training, safety cues, and intuition to predict developments that will the safety of responders.

Forecasting Tools

A TV meteorologist uses information provided by the National Weather Service, local radar, and satellite photographs to predict or forecast the weather. Likewise, the ISO has tools that can be used to predict the future of an emergency. The tools described below are intended to assist the ISO with structural fires, emergency medical incidents, and special operations incidents.

Structural Forecasting Tools

At a structural fire, the ISO’s forecast must consider the following:

- The features of the fire building:
  - Difficult access to the interior (maze-like floor plans increase risks) and
  - Utilities that are provided to the building: gas, electricity, or steam.

- Fire protection systems:
* Operating sprinklers indicate a working fire.

* Added weight from sprinkler water eventually may cause structural problems.

* Automatic or manual smoke vents may assist firefighters working in interior positions.

* The presence of special agent systems, such as dry chemicals and Halon, indicates a special hazard is present. These systems usually are designated to discharge only one time.

• Access for fire crews:

  * Working in large buildings presents fatigue problems.

  * If the fire appears to be in hidden spaces, opening up for suppression will be time-consuming and will cause firefighters to become fatigued.

• Egress for crews working on the interior:

  * Crews must be able to find their way out if an emergency occurs.

  * Ladders to upper story windows provide alternate escape routes.

• Construction type:

  * Bowstring truss and lightweight truss roofs often fail early. Their failures can have dramatic and deadly consequences.

  * Look for the presence of “stars” and other indications that the structure has been reinforced by steel rods.
* Look and listen for early signs of structural failure, for example groaning, smoking mortar, and bulges.

* Look for other construction hazards such as suspended loads.

- Age of the building on fire:
  * Older buildings generally do not have lightweight trusses.
  * Egress and access may be difficult.
  * Look for signs of structural weakness such as reinforcing rods.
  * A new building is just as likely to collapse as an older building.

- Potential for fire extension into exposed buildings:
  * Gauge the amount of fire involvement.
  * Gauge the distance between buildings.
  * Gauge the wind conditions.

- Amount of fire involvement:
  * Big fires usually mean no survivors and less benefit from risk to firefighters engaged in interior operations.
  * Greater fire involvement leads to early structural failure.

- Roof hazards:
  * Ladders at two corners allow for escape.
* Firefighters walking on structural members is a hazard.

* No “roof shepherds”; once hole is cut, get off the roof.

* If fire is well vented, no hole is needed.

* Watch for potential collapse, bowstring trusses, and lightweight wood trusses.

- Time:

  * Time from ignition to flashover may be as little as 2 or 3 minutes.

  * The longer the fire burns, the weaker the structure becomes.

  * Taking into account the time interval between the arrival of the first unit on the scene and the response time of ISO, it is possible that the incident has been going on for much longer than the ISO has been there.

  * Time can work against emergency responders.

- IC’s tactical objectives:

  * If things do not go as the IC hoped, firefighters must be able to remove themselves from the hazard area.

  * The ISO must know the IC’s attack plan and how it will be carried out.

  * Water supply (hydrants or tanker operation) must be adequate to support safe operations. Insufficient water, or running out of water, can put firefighters in a dangerous position. Look for hydrants or recommend a tanker operation.

- Weather:
* Extreme heat dictates the early initiation of rehab, and more frequent work/rest cycles.

* Cold weather presents hazards in addition to hypothermia, for example slippery surfaces and mud.

* Electrical storms may create lightning hazards.

* Ground ladders may be blown over by strong winds.

Medical Emergency Forecasting

Medical emergency forecasting includes forecasting for:

- Protection from communicable diseases;

- Protection from physical hazards such as sharp surfaces (use full PPE during extrication, including members who are inside the car as it is being cut apart);

- Violent acts:
  - If a crowd has gathered, individuals may become agitated or violent toward responders.
  - The person who committed the violent act still may be in the area.
  - Escape routes will be needed if the situation worsens.
  - Law enforcement presence helps to ensure responders’ safety.

- Protection from surroundings:
  - Moving traffic—emergency vehicles should be used to shield from traffic if possible, and
  - Weather—for example, heat, cold, rain, or sleet.
• Sufficient staffing:
  
  * Staffing must be adequate to carry and load the patient(s) into the ambulance.
  
  * Help may be available from bystanders or law enforcement officials.
  
  * If the patient is far from the road or from a paved surface, more people will be needed to carry the gurney.

**Rapid Intervention Crews**

NFPA 1500 requires having specifically designated rescue crews at the incident scene. This requirement is based on the realization that firefighters are exposed to the highest risk of injury or death while operating at the scene of an emergency and that one of the most effective mechanisms for reducing the risk is to have an RIC ready to come to the assistance of emergency personnel should the need arise.

One of the primary concerns should be to reduce the risks that firefighters are exposed to during emergency operations. It is not realistic, however, to assume that all the risks can be avoided, controlled, or eliminated from the firefighter’s environment. Firefighters realize that danger is part of their work environment, and the possibility that things can go wrong always must be considered. Recognizing this possibility, firefighters must make some provisions to assist members who find themselves in trouble.

An important aspect of incident management is to identify the risk characteristics of the situation and to evaluate specific risk factors that apply to each activity. A situation involving a high level of risk requires a greater commitment to rapid intervention for the rescue of emergency personnel, should something go wrong. An interior fire in a small, single-story building presents a certain level of risk to the firefighters who
enter to search for occupants and extinguish the fire. While a situation may appear routine, things still things could go wrong and place firefighters in danger. A flashover could envelop them in flames; a structural collapse could trap them; or a faulty SCBA could cause a firefighter to run out of breathable air. In a small, single-story occupancy, the chances are fair that firefighters could extricate themselves from most situations if they are a short distance from an exit that leads directly to the exterior. The same fire situation in a large building, in a basement or an upper floor, in the hold of a ship, or in a high-rise building presents a much greater threat simply because the ability of individuals to rescue themselves is reduced by the distance they would have to travel to reach a safe area and the difficulties they might encounter along the way.

The risk may also be increased by the nature of the task in which firefighters are involved. Rescuing an unconscious worker from a confined space that is filled with toxic and flammable vapor is much more dangerous to rescuers than removing an unconscious person from a wrecked automobile on a city street. Both situations involve a degree of risk to the rescuers, but the nature and degree of the risks are very different.

The composition and placement of RICs may be somewhat agency-specific, dictated by individual needs and resource availability; however, it is important that written procedure/guidelines be developed for crews to use, especially when they are performing exterior operations in support of interior crews. These written procedures also should include evacuation signals and guidelines for implementing evacuation and relocation of personnel from the area of danger. In addition, for agencies involved in auto/mutual aid response, it is important to develop consistency among the participating agencies in the use of RICs.
Dedicated Rapid Intervention Crews

RICs should consist of a minimum of two members, fully equipped with appropriate clothing, SCBAs, portable radio, and necessary tools to be effective. The RIC should also monitor the tactical radio channel to maintain a complete and accurate understanding of operations and changing conditions as well as location of tactical personnel. This information should be documented on a tactical worksheet by a member of the RIC.

In the early stages of an incident, RIC personnel may perform other functions, for example, secure utilities, flake-out hose lines, or work in the Command Post (CP). However, they must remain prepared to re-deploy to perform rapid intervention functions. As the incident expands in size or complexity, personnel should be assigned as a dedicated RIC. Placement of the RIC may be dependent on the incident; for example, in a high-rise operation, the RIC should be located in staging (two floors below the fire). In many other situations, a good location would be near the CP or close to operations. The RIC should not be located in a position that would interfere with CP operations. If the incident covers a large geographic area, more than one RIC may be required.

In a hazardous materials operation, the entry team leader must ensure that there is an RIC of at least two personnel in the appropriate level of protection before the primary entry team accesses the hot zone. In a hazardous materials operation, this team is designated as a backup team. The personnel of the backup team need to have the same level of required technical competency as the entry team. This includes the appropriate level of protection required for the material(s) involved.

While there is some flexibility in procedural issues regarding rapid intervention, it is paramount that whenever personnel are operating in positions or performing functions that would subject them to immediate danger, in the event of equipment failure or other unexpected sudden event, at least one properly attired RIC must be available to provide assistance or rescue.
Rapid intervention procedures should not be confused with initial interior structural firefighting operations addressed in NFPA 1500. NFPA 1500 requires the presence of four personnel before beginning interior structural firefighting. Two members operate in the hazardous materials atmosphere, while the other two members are the rescue team outside the hazardous atmosphere. If there is an immediate life safety situation, rescue may be initiated, but members should evaluate carefully the risk that they would be exposed to by taking such actions. If it is determined that the situation warrants such action, incoming companies should be notified so that they will be prepared to provide necessary support and backup upon their arrival. When waiting to be deployed, members of the RIC may be assigned to other tasks, for example, the pump operator or initial IC, as long as these other activities do not interfere with their ability to respond as the RIC.

For example: A chief officer with two engines and one truck is operating at a structure fire. A portion of the second floor collapses. That information is transmitted to the IC. At this point, a likely scenario is as follows:

- The IC activates a signal and, by radio, orders all personnel out of the building.
- A Personnel Accountability Report (PAR) is taken, and it is found that one member is missing. That member was last seen working near the collapse area.
- The RIC team is directed to enter the structure, quickly assess it stability, recover the missing firefighter, and remove the member from danger.
Activity 6.5:
Forecasting
Student Activity Worksheet

Time: 20 minutes

Purpose:
To gain experience forecasting risks to emergency responders.

Directions:
1. Your instructor will show you a series of slides. After briefly viewing the slides, you are to forecast and list risks to the responders based on what you see.
2. Your instructor may call on you to discuss your observations with the class.
Slide 1: High-rise fire

Risks to responders:

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Slide 2: Supermarket fire

Risks to responders:

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
Slide 3: Fire extending into a structure

Risks to responders:

---

Slide 4: Factory fire

Risks to responders:

---
Slide 5: Brush engine on rail line

Risks to responders:

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

SM 6-60
Acceptable Risks

Risks for Responders

Emergency response personnel are action oriented. The excitement and challenges in the emergency services draw people who are willing to take risks. Fire departments, EMS providers, and other emergency service providers routinely accept risks that would not be acceptable in the private sector.

The acceptance of higher levels of risk does not mean that responders should lay their lives on the line in every situation. The provision of training, protective clothing and equipment, SOGs, the use of ICS, and the use of ISOs minimize risks to responders.

Risk Management Plan

A risk management plan is a tool for determining which risks are acceptable. Each action at the emergency scene carries with it a benefit and a risk. Acceptable risks are those where the benefit is of more importance or value than the negative possibilities posed by the risk. A simple risk management test that can be used to help the ISO to evaluate risks that are not specifically addressed in the agency’s risk management plan is outlined below. It may sound simple, but the decisions that must be made with this tool are by no means simple.

- Emergency responders may risk their lives in a calculated manner to save a life.
- Emergency responders may place themselves in situations with moderate risk to save property.
- Emergency responders will risk nothing to save lives that already have been lost or property that already has been destroyed.
Unacceptable Risks

Some risks are clearly unacceptable, even for emergency responders. This fact should be addressed in the response agency’s risk management plan.

While the primary responsibilities for the development of this plan are usually placed with the HSO, members of the organization who may serve as ISOs should have input into the plan’s development. In many cases, the HSO may act as the ISO at particular emergency incidents. In other cases, other members of the response agency serve as the ISO. In any case, the ISO on every incident must interpret and apply the agency’s risk management plan. Personal judgment on the part of each ISO will play a major part in this ongoing activity.

When a Risk is Unacceptable

There is no reason to risk the life of an EMS responder in a situation where the injured person is inaccessible because of gunfire or some other extreme hazard. There is no reason to risk a firefighter’s life to mount an interior attack on a fire in an unoccupied building.

Not all risk management decisions are this simple. We live in a complicated world, and there is a fine line between an acceptable risk and an unacceptable risk. This line can be blurred further by bad information or a lack of information about the emergency.

While the IC has overall responsibility for the safety of all responders on the emergency scene, he or she depends on the ISO to help with this critical obligation. The ISO must evaluate the situation continuously to ensure that the IC is aware of the risks of an operation and the consequences if something goes wrong.

In some cases, the IC may make a tactical decision without being aware of all of the risks that responders will face. Some
command decisions are made with good information and full awareness of the risks to be faced. In some situations, the IC may make a decision to take a significant risk because of the significant benefit that will occur if the decision pays off.

The ISO’s primary concern is the safety of responders working at the scene of an emergency. If the ISO believes that an operation, or any part of it, is an unacceptable imminent danger to responders, the ISO has the authority to alter, suspend, or terminate an operation or parts of the operation.

**Altering, Suspending, and Terminating Unsafe Operations**


NFPA 1521, Chapter 2-3.3 states:

“At an emergency incident, where activities are judged by a safety officer to be unsafe or involve an imminent hazard, the safety officer shall have the authority to alter, suspend, or terminate those activities. The safety officer shall immediately inform the incident commander of any actions taken to correct imminent hazards at an emergency scene.”

The OSHA HAZWOPER (q)(3)(viii) regulation states:

“When activities are judged by the safety official to be an IDLH (Immediately Dangerous to Life and Health) and/or to involve an imminent danger condition, the safety official shall have the authority to alter, suspend, or terminate those activities. The safety official shall immediately inform the
individual in charge of the ICS (Incident Command System) of any actions needed to be taken to correct these hazards at the emergency scene.”

While the ISO does have the authority to alter, suspend, or terminate an activity, this authority must be balanced between the need to protect the lives of responders and the ISO’s role in the incident management system. The IC counts on the ISO to look out for the safety of responders and to inform the IC of situations that present risks to responders. In most cases, when the ISO spots a risk to the safety of responders, the ISO can take minor corrective action to address the problem, such as asking the responder to wear gloves or coordinating with a division officer to establish a collapse zone. The situation where an ISO would terminate an operation without first consulting with a division officer or the IC is extremely rare and reserved for hazards that place responders in imminent danger.

If the ISO decides that it is necessary to terminate, suspend, or alter a significant part of an operation without the prior approval of a division officer or the IC, the ISO should be able to defend his or her action to the IC. A confrontational relationship between the ISO and the IC should be avoided if at all possible. The ISO is a support officer to the IC and the IC may choose to reverse the decision of the ISO and continue an operation. It is in the best interest of the ISO, the IC, and the responders working on the scene to keep communications between the ISO and the IC positive and supportive.

The decision to alter, suspend, or terminate an operation or part of an operation must not be taken lightly. The ISO must consider the impact of this action on the rest of the emergency operation. Termination of one part of an emergency may place responders operating in other areas of the emergency in great danger. The ISO must relay the decision to terminate an operation to the IC as soon as possible.
These decisions tend to be significant events that will be remembered for a long time by both the IC and the ISO. The ISO must make sure that the decision is valid, but cannot engage in hours of discussion and consideration. If time permits, the safety of the overall operation may be improved if the ISO can consult face-to-face with the IC before terminating an operation. Career considerations must take a back seat to the primary function of the ISO—safety.

Module Summary

The basic duty and responsibility of the ISO is to protect the safety of the responders. The ISO as an effective risk manager can protect the safety of responders. The ISO needs knowledge of safety concerns at incidents to which his or her department or agency responds. The ISO must know his or her limitations and when to get help. The ISO must be able to work as an integral part of an ICS organization.

The ISO is the on-scene risk manager, but the IC is responsible for the safety of all members and for being responsive to the concerns of the ISO. The ISO uses the agency risk management plan, risk management techniques, training, experience, safety cues, and intuition to perform his or her job. While the ISO has a responsibility for the safety of responders, he or she must operate as a support officer for the IC. The ISO must look for immediate risks and forecast risks that may threaten the safety of responders. The ISO has the authority to alter, suspend, or terminate an unsafe operation. Good communications between the ISO and the IC help assure the safety of responders.
MODULE 6

APPENDIX: ICS FORM 208
SITE SAFETY AND CONTROL PLAN

1. Incident Name: 2. Date Prepared: 3. Operational Period:

Section I. Site Information

4. Incident Location:

Section II. Organization

8. Safety Officer: 9. Entry Leader: 10. Site Access Control Leader:
14. Environmental Health: 15. 16.

Section III. Hazard/Risk Analysis

17. Entry Team: (Buddy System)

<table>
<thead>
<tr>
<th>Name</th>
<th>PPE Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry 1</td>
<td>Decon 1</td>
</tr>
<tr>
<td>Entry 2</td>
<td>Decon 2</td>
</tr>
<tr>
<td>Entry 3</td>
<td>Decon 3</td>
</tr>
<tr>
<td>Entry 4</td>
<td>Decon 4</td>
</tr>
</tbody>
</table>

18. Decontamination Element:

<table>
<thead>
<tr>
<th>Name</th>
<th>PPE Level</th>
</tr>
</thead>
</table>

19. Material:

<table>
<thead>
<tr>
<th>Container Type</th>
<th>Qty.</th>
<th>Phys. State</th>
<th>pH</th>
<th>IDLH</th>
<th>F.P.</th>
<th>I.T.</th>
<th>V.P.</th>
<th>V.D.</th>
<th>S.G.</th>
<th>LEL</th>
<th>UEL</th>
</tr>
</thead>
</table>

Comment:

Section IV. Hazard Monitoring

20. LEL Instrument(s):

21. O₂ Instrument(s):

22. Toxicity/PPM Instrument(s):

23. Radiological Instrument(s):

Comment:

Section V. Decontamination Procedures

24. Standard Decontamination Procedures: YES: NO:

Comment:

Section VI. Site Communications

25. Command Frequency:

26. Tactical Frequency:

27. Entry Frequency:

Section VII. Medical Assistance

28. Medical Monitoring: YES: NO:

29. Medical Treatment and Transport In-place: YES: NO:

Comment:
### Section VIII. Site Map

30. Site Map:

<table>
<thead>
<tr>
<th>Weather</th>
<th>Command Post</th>
<th>Zones</th>
<th>Assembly Areas</th>
<th>Escape Routes</th>
<th>Other</th>
</tr>
</thead>
</table>

### Section IX. Entry Objectives

31. Entry Objectives:

### Section X. SOP S and Safe Work Practices

32. Modifications to Documented SOPs or Work Practices: YES: NO:

Comment:

### Section XI. Emergency Procedures

33. Emergency Procedures:

### Section XII. Safety Briefing

34. Asst. Safety Officer - HM Signature: Safety Briefing Completed (Time):

35. HM Group Supervisor Signature: 36. Incident Commander Signature:
INSTRUCTIONS FOR COMPLETING THE SITE SAFETY AND CONTROL PLAN  
ICS 208 HM

A Site Safety and Control Plan must be completed by the Hazardous Materials Group Supervisor and reviewed by all within the Hazardous Materials Group prior to operations commencing within the Exclusion Zone.

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Title</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Incident Name/Number</td>
<td>Print name and/or incident number.</td>
</tr>
<tr>
<td>2.</td>
<td>Date and Time</td>
<td>Enter date and time prepared.</td>
</tr>
<tr>
<td>3.</td>
<td>Operational Period</td>
<td>Enter the time interval for which the form applies.</td>
</tr>
<tr>
<td>4.</td>
<td>Incident Location</td>
<td>Enter the address and or map coordinates of the incident.</td>
</tr>
<tr>
<td>5 - 16.</td>
<td>Organization</td>
<td>Enter names of all individuals assigned to ICS positions.  (Entries 5 &amp; 8 mandatory). Use Boxes 15 and 16 for other functions: i.e. Medical Monitoring.</td>
</tr>
<tr>
<td>17 - 18.</td>
<td>Entry Team/Decon Element</td>
<td>Enter names and level of PPE of Entry &amp; Decon personnel.  (Entries 1 - 4 mandatory buddy system and back-up.)</td>
</tr>
<tr>
<td>19.</td>
<td>Material</td>
<td>Enter names and pertinent information of all known chemical products. Enter UNK if material is not known. Include any which apply to chemical properties. (Definitions: ph = Potential for Hydrogen (Corrosivity), IDLH = Immediately Dangerous to Life and Health, F.P. = Flash Point, I.T. = Ignition Temperature, V.P. = Vapor Pressure, V.D. = Vapor Density, S.G. = Specific Gravity, LEL = Lower Explosive Limit, UEL = Upper Explosive Limit)</td>
</tr>
<tr>
<td>20 - 23.</td>
<td>Hazard Monitoring</td>
<td>List the instruments which will be used to monitor for chemical.</td>
</tr>
<tr>
<td>24.</td>
<td>Decontamination Procedures</td>
<td>Check NO if modifications are made to standard decontamination procedures and make appropriate Comments including type of solutions.</td>
</tr>
<tr>
<td>25 - 27.</td>
<td>Site Communications</td>
<td>Enter the radio frequency(ies) which apply.</td>
</tr>
<tr>
<td>28 - 29.</td>
<td>Medical Assistance</td>
<td>Enter comments if NO is checked.</td>
</tr>
<tr>
<td>30.</td>
<td>Site Map</td>
<td>Sketch or attach a site map which defines all locations and layouts of operational zones.  (Check boxes are mandatory to be identified.)</td>
</tr>
<tr>
<td>31.</td>
<td>Entry Objectives</td>
<td>List all objectives to be performed by the Entry Team in the Exclusion Zone and any parameters which will alter or stop entry operations.</td>
</tr>
<tr>
<td>32 - 33.</td>
<td>SOP s, Safe Work Practices, and Emergency Procedures</td>
<td>List in Comments if any modifications to SOP s and any emergency procedures which will be affected if an emergency occurs while personnel are within the Exclusion Zone.</td>
</tr>
<tr>
<td>34 - 36.</td>
<td>Safety Briefing</td>
<td>Have the appropriate individual place their signature in the box once the Site Safety and Control Plan is reviewed.  Note the time in box 34 when the safety briefing has been completed.</td>
</tr>
</tbody>
</table>
Chief Officer Training
Curriculum

Operations
Module 7:
Fire Cause Determination I

Objectives

♦ Identify critical observations made en route to a fire
♦ Identify critical observations made during size-up
♦ Identify critical observations made during suppression

Objectives (continued)

♦ Identify critical observations made during overhaul
♦ Identify and describe major principles of combustion
♦ Identify and describe three methods of heat transfer
Objectives (continued)

- Differentiate between flashover and backdraft
- Distinguish among the four classes of fire
- Identify and describe the three phases of burning

Overview

- Fire origin and cause determination during response and arrival, size-up, suppression, and overhaul
- Examining fire behavior and applying principles to cause determination

Dispatch Alarm Center
Observations During Size-Up

Spectators

Fire Location on Arrival
Ventilation of Normal Burn-Through

Observe Flame Color and Intensity

Smoke Color Normal for Type of Fuel?
Observations During Suppression

- Identify first-in firefighter

Forcible Entry

Plaster Cast Made of Tracks or Prints
Condition of Doors

Locked Position

Unlocked Position

Conditions of Windows

Locked Position

Unlocked Position

Tampering with Fire Detection Equipment
Observations During Overhaul

- Items missing or out of place

Signs of Burglary

Unusual Signs of Fire Activity
Unusual Fire Spread

Other Observations

Structure features

Utilities

TAMPERING?

Penny behind the fuse
Condition of Electrical Wiring

Activity 7.1: Observations

Observation One
Observation Two

Observation Three

Observation Four
Observation Five

Role of the Officer

- Makes initial critical observations
- Determines if the fire behaved as expected
- Describes observations

Fire Behavior

- Fire is a complex process that must be understood to formulate scientifically based opinions.
Definition of Fire

Fire is a self-sustaining rapid oxidation process usually accompanied by the evolution of heat and light.

Combustion Depends Upon

- Type of fuel
- Physical arrangement of fuel
- Available of oxygen

Fire Triangle
Fire Tetrahedron

- Chemical chain reaction required to continue flaming combustion
- Four elements create pyramid structure
- If any one of elements removed, fire extinguished

Flashpoint

- Lowest temperature at which solid or liquid will produce sufficient vapors to ignite
- Examples:
  - -45°F for gasoline
  - +100°F for fuel oil #2

Flammable Liquids

Flammable liquids have a flashpoint below 100°F.
Combustible Liquids

Combustible liquids have a flashpoint at or above 100°F.

Ignition Temperature

- Minimum temperature to which a substance must be heated to ignite
  - Auto ignition: ignition without assistance of external pilot source
  - Piloted ignition: external flame, spark, or glowing ember

Flammable or Explosive Limits

- Lower Explosive Limits (LEL)
  - Lowest concentration of vapors in air that will burn
- Upper Explosive Limits (UEL)
  - Highest concentration of vapors in air that will burn
Specific Gravity

- Ratio of weight of substance (liquid) compared to water
- Water is given a value of "1"

United States Fire Administration

Vapor Density

- Weight of product compared to air (1.0)
- Products with a specific gravity of:
  - <1, product floats on water
  - >1, product will sink in water

United States Fire Administration

Solubility

- Ability of product to dissolve in water
- Examples:
  - Acetone and ethyl alcohol readily dissolve in water
  - Gasoline and kerosene float or sink in water

United States Fire Administration
Pyrolysis

- Chemical decomposition of matter through action of heat
- Generally applies to solid fuel
- “The transformation of a compound into one or more other substances through the action of heat.”
- The effect on wood is charring

Activity 7.2:
Predicting Fire Behavior

Fire Behavior (continued)

- Rate of Heat Release (RHR)—indicates how fast heat (energy) in fuel is released
British Thermal Unit (BTU)

Amount of heat needed to raise one pound of water 1°F.

Heat Transfer

- Heat transfer affects fire suppression activities
- Often helps explain fire spread from one location to another

Three Methods of Heat Transfer

- Convection
- Conduction
- Radiation
Convection: Rising of Heated Air

Convection

Conduction

Transfer of heat through solid medium such as brick
Conduction (continued)

Heat transferred through a solid

Radiation

Transfer of heat energy by electromagnetic waves

Radiation (continued)

Heat transferred through air
**Flashover**
- Flames flash over entire surface of room/area caused by buildup of heat from fire.
- All contents of fire area gradually heat to ignition temperatures. Simultaneous ignition occurs, and area becomes fully involved.
- Ignition almost instantaneous.

**Backdraft**
- In hot, smoldering phase, burning incomplete because of insufficient oxygen.
- As soon as needed oxygen rushed in, stalled combustion resumes.

**Fire Classifications**
- Class A—Ordinary combustible materials
- Class B—Liquids
- Class C—Energized electrical equipment
- Class D—Combustible metals
Incipient or Beginning Stage

Incipient phase is earliest phase of fire, beginning with actual ignition.

- Slovenia over 180°F (80°C)
- Rising hot gases
- Air approximately 20% oxygen

GROWTH STAGE

AMBIENT ROOM TEMPERATURE

HEATED AIR RISES

INVERTED V

PROYLES BEGINS

COOL AIR ENTERS

Free Burning Stage

Generally considered phase of fire where sufficient oxygen and fuel available for fire growth and open burning to point where total involvement possible.
**Smoldering Stage**

After free burning phase, flames may cease to exist if area of confinement sufficiently airtight and oxygen level is lowered to 16 percent or less.

- Oxygen below 15%
- Temperature throughout is high
- CO and carbon may cause backdraft

**Developmental Stages of Fire**

- Backdraft (confined spaces)
- Flashover
- Backdraft
Activity 7.3:
Stages of Burning

Module Summary

- Critical observations
  - During response and arrival
  - During size-up
  - During suppression
  - During overhaul
- Understanding fire behavior
  - Unusual situations
  - Suppression
  - Fire progression
MODULE 7

FIRE CAUSE
DETERMINATION I
MODULE 7:

FIRE CAUSE DETERMINATION I

Objective

Upon completing the module, you will be able to make critical observations about the area of fire origin and fire cause.

Methodology

This module uses lecture, discussion, and activities.

NFPA 1021 Standards Cross-Reference Matrix

3-5, 4-5
Introduction

The fire officer is often in the best position to make critical observations regarding a fire. The officer can compare this fire to similar fires and draw parallels between them for similar fire behavior patterns. The observations of the fire officer during the various stages of an incident are extremely critical. From the moment of dispatch through the overhaul phase, the company officer’s senses are exposed to countless stimuli, many of which can help make a determination of fire origin and cause. The scenes observed can never be duplicated in a courtroom. The fire officer may be the critical link in the prosecution of an accused arsonist in convincing a jury that the fire was unusual.

Critical Observations

We will consider the following phases during which critical observations are possible:

- Responding and arriving,
- Size-up,
- Suppression, and
- Overhaul.

During the incident, the fire officer will see thousands of images and make hundreds of decisions, many instantaneously. The many phases of the operation will provide the officer the opportunity to make particular observations that may be critical to the fire cause determination. On the other hand, the officer may note something casually that later will emerge from memory. This casual note may also be a critical piece of information.
Observations: Responding and Arriving

Unusual Information

The first critical piece of information about the fire usually will come from the person calling in the alarm. This person may be the discoverer of the fire, the occupant of the building on fire, or just a person passing by who saw the fire. In today’s world of instantaneous communications, mobile telephones in many cars make it possible for even a passerby to report an incident.

The person receiving the information from the caller should try to record all of the following pieces of information.

The name of the person reporting the fire—It is important to note any accents or speech impediments, the pitch that would distinguish the voice of a child or a woman from that of a man, the speed of the speech, and any other distinctive traits.

State of the person reporting the fire—The person reporting the call should note whether the caller sounded calm or excited. If the fire was not planned, one would expect some level of excitement in the caller’s voice, especially if it were the owner or an occupant reporting the fire.

Indication of any background noises, especially if they are unusual—If a person is calling from inside a building, one would not expect to hear trucks rumbling by. However, if one is calling from an outside telephone, the likelihood of trucks rumbling by or other traffic noise is much greater.

The exact address of the fire or at least specific information on the area such as street names and landmarks.

Weather Conditions

The officer should note weather conditions. Also, note wind direction and speed and compare with the direction of fire.
travel. Wind may account for the intensity and/or spread of the fire.

Do not fail to make note of clear weather conditions versus rain, snow, or ice. If the fire was incendiary, it may have been the arsonist’s intention to set the fire in bad weather in order to delay the fire department’s response.

Temperature and humidity readings should be obtained. Freezing temperatures may cause fire hydrants to freeze, or pose other hazards that can delay fire suppression. Climatic conditions and statistics can be obtained by a telephone call to the nearest office of the National Weather Service.

Another key point to note is a change in weather conditions since the arrival of fire companies and the effects of these weather changes on fire suppression operations.

**Time of Day/Day of Week**

The times and methods of alarms will probably be recorded automatically. Time plays an important role in origin and cause determination.

Alarms allow one to show any abnormal time span between the time the fire was reported and the amount of fire at the time of the first arrival of emergency personnel. Later, the officer might need to identify and interview the person(s) who reported the fire. In addition, it is important to note and record the arrival time of the first-in fire company.

If it was a telephone alarm, most emergency dispatch centers automatically record the location from which the call was made; the caller then can be identified and interviewed. In the event the alarm was received by a municipal alarm box, a neighborhood canvass may turn up a witness to identify who pulled the box. If a private alarm service received the fire alarm, ascertain if there have been any problems with the system or abnormal tests by the client.
Response Route

The next critical phase for making observations begins with the response. While en route, the officer should be aware of anything unusual, especially as he/she nears the fire scene. Vehicles traveling away from the fire scene without lights at night or with persons crouching down in the seat to avoid being observed might be good indications that they were linked with the fire. Pedestrians may be casually or hurriedly leaving the fire scene itself; they may be acting suspiciously.

Of particular interest to the officer are other factors that are not directly associated with the fire itself but which may have some tie-in. Was the timing of the fire such that response was slowed because of a train passing through a grade crossing or a drawbridge raised over the water? There may be no link at all; on the other hand, there may be.

Road construction or repairs can cause delays, especially an unsuspected detour.

Traffic patterns at certain times of the day (morning or evening rush hours) can cause delays. Someone who planned a fire may take advantage of a social event like a parade or an athletic event that can cause huge traffic bottlenecks. The sharp officer will note anything of an unusual nature.

The vehicles in the area of the fire may carry some valuable clues. The officer may find it helpful to question witnesses and any other responding emergency personnel as to their observations while en route to, or after arrival. Ask if they have observed the same vehicles at fire scenes on more than one occasion. Note and identify any vehicles that were damaged by fire, heat, or smoke. Try to find out why these vehicles were there.

Attempt to obtain and record descriptions and license plate numbers. The drivers/owners may be questioned later regarding the reasons their vehicles were at the fire scene.
This listing is not exhaustive. Experienced company officers and firefighters probably can think of many more observable factors that can be noted during the response phase.

**Environmental Considerations**

Observations about the immediate vicinity of the fire may provide an insight into circumstances surrounding the fire. Some areas of the community may be more prone to fires than others. Fires may occur more often in areas with transient populations than in areas that have had the same owner/occupant for years.

Areas with a high occupancy turnover may not have a fire reported as quickly as other areas. Late reporting may be observed upon arrival in the heavy fire conditions and in the deep charring of structural members. This latter fact may not be known for some time, however.

Uninhabited properties or properties for sale pose interesting possibilities. The fact that the property is for sale or has been for sale for some time is **not of itself** cause for suspecting an incendiary fire. The fire cause determination must be done just as it would be for any other fire. If the fire is determined to be incendiary, an investigator will need to do a great deal more work to prepare a case against an individual for starting the fire.

However, this activity goes beyond the responsibility of the company officer, although he/she may assist the investigator in a number of ways.

Fires in remote sections of the community or in sections that may have daytime, but not nighttime occupancy may burn longer before being discovered.

As noted above, this listing is not complete. The intent is to get the company officer and firefighters thinking about what we call “environmental factors” that will help to make a correct origin and cause determination.
Observations During Size-Up

The next important phase for making observations is the size-up period. Upon arrival, firefighters seek out available occupants to ascertain the rescue needs of unaccounted-for occupants. This task does not negate the need for a primary search, but does narrow down the responsibilities for search. Without a doubt, the fire scene itself provides the greatest chance for observations. There is a whole range of possibilities. During this activity, one should take note of several items.

Occupants
Questions to ask regarding the occupants include:

• Are the occupants wearing clothing that one would expect for that time of day at that time of the year?

• Did the occupants have time to retrieve special items such as a child’s favorite toy, a pet, the insurance policy, someone’s favorite fishing pole or shotgun, photos, jewelry, or valuable antiques?

• Are there any signs that the occupants have burns, cuts, or singed body hair that may indicate they were close to the fire?

• Is there any sign of soot around their mouths to indicate they were breathing smoke?

• Do any of the occupants need medical attention?

Spectators
Another set of possibilities rests with the spectators in the area. Large numbers of spectators usually will gather to observe any type of disaster. Fires are no exception.
Spectators may show signs of having been involved in starting the fire. They may be wearing fire-damaged clothing or clothing that has an odor of accelerants. They may show visible fire injuries.

Questions concerning spectators include:

- Are there any spectators who have been seen at other fires, especially fires of a similar nature in the same general area?

- Is anyone acting strangely, hiding in shadowed areas, standing out for some reason, or trying too hard to blend into the crowd?

People who intentionally start fires often will stay at the fire scene to see the results of their efforts. Many fire investigations reveal that the same person has been seen at several fires. When arrested, these people state that they stayed at the fire scene to watch the activities.

Unfortunately, this frame of mind also extends to the fire service. Many fires are set by members of fire companies who are seeking thrills associated with responding.

Groups of spectators can be videotaped or photographed for a later detailed review. Things that may prove helpful include:

- Familiar faces or individuals seen at other fires;

- The actions of spectators, such as individuals who appear too concerned about the incident or are too vocal about the incident, displaying criticism about fire and/or police agencies, neighbors, society, and/or governmental agencies;

- Individuals who appear to be too quiet or withdrawn, or overly frightened about the fire; and
• Individuals who appear to be too excited about the emergency, overly brave, helpful, or curious.

The appearance of spectators may provide helpful information. Construction or repair crews should be noted. Accidental fires often result from repair crews working in the structure. Repair crews may be reluctant to be interviewed for fear of the loss of their jobs if they had any part in the fire or fear of liability for damages caused by the fire.

Structure and Location of Fire

During size-up and suppression operations, you can make many observations about the location of the fire, the extent of the fire, and the path of fire travel. These observations may be critical during the fire scene examination to help determine if fire behavior was normal or if it was assisted.

It is critical to determine if the location of the fire upon responder arrival corresponds with the information from the caller. A fire reported in the basement that is a fully involved attic fire upon arrival may be explained because of the type of building construction. On the other hand, it may have been intentionally started in the attic with a trailer from the basement.

It also is important to establish if the fire spread and traveled as anticipated for the type of building and occupancy. The spread of the fire may be very typical or normal, or the spread may indicate it had some assistance.

Observe how the fire vented itself, noting natural ventilation versus fire company venting. Note removal of debris, furnishings, stock, and supplies. Provide security for materials or debris that may aid in identifying the point of origin or fire cause.

If fire suppression (extinguishment) activities still are occurring, note both damaged and undamaged areas of the structure. The structure may suffer extensive damage during
the suppression phase. Realizing this fact helps eliminate wasted time and effort in determining the origin of the fire. Areas of extensive damage may not indicate area of origin.

Other fire areas may have required more immediate attention by fire personnel because of the need for protecting dangerous materials, protecting high-value areas, or the process of stopping fire extension to other areas of the building.

The officer should note areas of open burning (visible flames) which may indicate the types of fuel being consumed.

Ascertain whether there was a complete or partial structural collapse. Was there ignition or exposure of flammable or hazardous materials? Were there reports of any explosions? Were firefighters forced to fall back for any reason, or was there a fast fire spread overtaking the fire streams?

Any unusual signs of the occupants’ escape need to be noted. Things like ladders to windows, escape ladders from the windows, bed sheets tied together, or reports from a neighbor that the mother dropped her baby two floors into the arms of a passerby are strong indications that the occupant did not plan a fire.

**Flame and Smoke Characteristics**

The color of the smoke may indicate the type of material burning. Complete combustion often produces little or no smoke while dense smoke often indicates incomplete combustion.

Flame color also may indicate the type of materials being burned. As the amount of hydrocarbons increases, the flames will become darker or more orange in color. A lack of sufficient oxygen (air) usually causes flames to be darker than when the same fuel is burned in a well-ventilated area.
**Extreme caution is required.** During the later stages of the fire, smoke colors from materials burning may give false indications. In addition, most structures contain fuels with hydrocarbon bases which, when burning, may produce smoke and/or flames which could give misleading signs.

Here are some examples of smoke and flame colors as indicators of the type of material burning:

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Color of Smoke</th>
<th>Color of Flame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood</td>
<td>Gray to brown</td>
<td>Yellow to red</td>
</tr>
<tr>
<td>Paper</td>
<td>Gray to brown</td>
<td>Yellow to red</td>
</tr>
<tr>
<td>Cloth</td>
<td>Gray to brown</td>
<td>Yellow to red</td>
</tr>
<tr>
<td>Gasoline</td>
<td>Black</td>
<td>Yellow to white</td>
</tr>
<tr>
<td>Naphtha</td>
<td>Black to brown</td>
<td>Straw to white</td>
</tr>
<tr>
<td>Benzene</td>
<td>White to gray</td>
<td>Yellow to white</td>
</tr>
<tr>
<td>Lubrication oil</td>
<td>Black</td>
<td>Yellow to white</td>
</tr>
<tr>
<td>Lacquer</td>
<td>Brownish to black</td>
<td>Yellow to red</td>
</tr>
<tr>
<td>Turpentine</td>
<td>Brown to black</td>
<td>Yellow to white</td>
</tr>
<tr>
<td>Acetone</td>
<td>Black</td>
<td>Blue</td>
</tr>
<tr>
<td>Cooking oil</td>
<td>Brown</td>
<td>Yellow</td>
</tr>
<tr>
<td>Kerosene</td>
<td>Black</td>
<td>Yellow</td>
</tr>
</tbody>
</table>
Observations During Suppression Activities

During fire suppression efforts, the firefighters and officers will probably be in the best position to observe the fire. Physical aspects of the fire, such as materials burning, appearance of more than one area of fire origin, and the color of the fire, are critical observations. It also is essential to note the current stage of burning and the intensity with which the fire is burning.

Entry

Among the many other things to be noted are the doors. Was forcible entry necessary or were the doors already open or unlocked? Doors may have been left open accidentally in the occupants’ rush to flee the fire. On the other hand, open doors may be intentional. If the occupants state that they closed the doors, one should attempt to discover how they were opened. Neighbors or police officers who arrive before firefighters and try to help rescue the occupants often open doors to determine if everyone is out.

Difficulty of Extinguishment

Try to determine if the fire went out as would be expected or if the fire was difficult to extinguish. Fires that are difficult to extinguish and do not react normally to the application of water may have had a fuel load higher than expected. This situation should be noted and examined after the fire is out to determine the possible fuel load that caused the difficulty in extinguishment.

Unusual Observations

Was there anything unusual found during suppression, such as windows covered to hide the fire, a means of egress intentionally blocked by furniture, or disabled fire detection and suppression equipment? If the structure has detection equipment, such as smoke detectors, did any firefighter hear it operate? If the structure has fire suppression equipment such as automatic sprinklers, how did it perform in fire control and
suppression? Has it been tampered with, or did it operate as it should have?

It is impossible and unnecessary to list here everything the company officer and firefighters need to observe. The items mentioned here are some of the most important ones. Experience will reveal many others. Spending time with your colleagues in a discussion is a good way to generate a list of many more.

Observations During Overhaul

The last critical phase during which more observations can be made is the overhaul phase. In many respects, it is the best because you do not have to worry about the fire and you have plenty of time to carry out a careful examination. The overhaul phase is the first real opportunity to start making critical firsthand observations about the structure, its contents, and the circumstances that caused the fire.

Items Missing or Out of Place

The first thing to establish is whether there appear to be any items missing. On the other hand, are there any items present that shouldn’t normally be there? Do items appear to have been moved around before the fire, for example, a chair moved next to another chair or a chest of drawers repositioned?

A person planning a fire may remove things before the fire, for example, family photographs from the wall or off a table, favorite or expensive items of clothing, pets, or expensive sporting equipment and trophies. The fire officer who makes these observations needs to ask the correct questions of the owner or occupant about those items.

Unusual Prefire Activity

Look for indications of unusual prefire activity. In some situations, fire is used to cover a burglary. The evidence of
the burglary may be very apparent after fire suppression. Vending machines or cash registers pried open will still be pried open after the fire. File drawers forced open or left open are another indicator.

Doors that have been forced, broken windows, or other structural damage not caused by the fire may go unnoticed unless you are observant during the overhaul phase. In this respect, it is critical that firefighters disrupt things as little as possible. Sometimes, in their haste to perform overhaul, responders can remove or alter some very critical evidence.

Some clues may be directly related to certain motives. In fires that result from a broken relationship, finding clues to the motive is not uncommon. A person who finds that a spouse or mate has been unfaithful may pile the other’s clothing on the bed and set the bed on fire. Actions like this are also common when someone is seeking attention and feels that there is something standing in the way of a close relationship.

The fire officer may be the only person who connects with the evidence found at the scene with the circumstances that led up to the fire.

**Unusual Signs of Fire Activity**

The officer should note the features of the structure that allowed the fire, heat, or smoke to travel. Open stairs, pipes or electrical shafts, laundry chutes, or heat ducts are some of the most common paths of fire travel. Building renovations often result in dropped ceilings, covered walls, or new voids. Fire is often hidden in these voids and may burn for a considerable time before being discovered.

Finally, the utilities need to be evaluated to determine if they were operational, shut down at the time of the fire, or shut down by fire suppression personnel. Try to determine if there were any signs of malfunctions, improper usage of the utility, or other factors that could have caused or contributed to the fire.
Activity 7.1:
Observations
Student Activity Worksheet

Time: 30 minutes

Purpose:
To give you the opportunity to reinforce your observation skills.

Directions:
1. This activity is for the large group. Your instructor will show a set of slides and ask for observations.

2. Your answers should focus on the following information:
   - The type of construction,
   - The location and intensity of the fire,
   - The color and size of the flame and smoke, and
   - The exposures affected.

3. Write your observations in the blanks provided.
Observation one: two-story dwelling with addition

Observation two: interior view of a dwelling, smoke and fire

Observation three: interior view of a dwelling, smoke and fire
Observation four: inside the dwelling, two fires, building under renovation

Observation five: two-story, wood-frame dwelling; one room on fire

Notes:
Role of the Officer

Make Initial Critical Observations
As one of the first at the scene of a fire, the officer may see things critical to determining the area of fire origin and the fire cause. For example, the officer will observe the color of the flames or smoke, the location of the heaviest fire, and whether flashover has occurred.

Determine if the Fire Behaved as Expected
Careful observation will help discriminate between normal and abnormal fire growth and behavior. Examples of critical discrimination include noting whether the fire reacted violently to water, the fire appeared to spread rapidly from one floor to another with no combustible material in between, and structural elements with limited combustible materials present sustained excessive heat damage.

Describe Observations
Carefully noting observations, and later describing them to a fire investigator or jury, may be critical to a successful fire investigation or criminal prosecution. Examples of critical observations include explaining to a jury observations on how the fire reacted to water; explaining to a fire investigator that the fire was in the smoldering phase upon arrival, and a backdraft occurred soon after arrival; and explaining to a fire investigator how ventilation tactics affected normal fire spread and caused the unusual fire travel.

Fire Behavior

Definition of Fire
A good place to start is with the meaning of combustion.

“Combustion is an exothermic, self-sustaining reaction involving a solid, liquid, and/or gas-phase fuel. The process is
usually (but not necessarily) associated with the oxidation of a fuel by atmospheric oxygen. Some solids can burn directly by glowing combustion or smoldering, but in flaming combustion of solids and liquid fuels, vaporization takes place before burning. It is necessary to distinguish between two types of flaming: (1) premixed, in which gaseous fuel is mixed intimately with air before ignition, and (2) diffusive, in which combustion takes place in the regions where the fuel and oxygen are mixing. If premixed burning takes place in a confined space, a rapid pressure rise will occur, giving rise to an explosion.” (NFPA. *Fire Protection Handbook*, 17th Ed., p. 1-44.)

Although technically correct, such a lengthy and detailed definition of fire (or combustion) is very cumbersome. Therefore, a shorter, more concise definition such as the following may be preferred. Let’s call it a working definition.

Fire is a rapid, self-sustaining oxidation process usually accompanied by the evolution of heat and light in varying intensities.

Of all the terms learned throughout this course, the definition of fire is one of the most important. This is because the process of combustion underlies everything else we need to consider in reaching our accurate fire origin and cause determination.

**Principles of Combustion**

**The Fire Triangle**

The fire officer must be familiar with basic fire chemistry. First, we will discuss the principles of burning and the elements necessary to produce burning.

The triangle theory is still used for a simple explanation. Until recently, all fires were described or explained as being a triangle of three essential elements. These three elements are heat, fuel, and oxygen. Remove any one of these three elements and the fire goes out.
The fire triangle continues to explain the glowing fire, that is, a glowing fuel mass without flaming combustion. Modern research has expanded the understanding of open or flaming combustion by adding a fourth element.

**The Fire Tetrahedron**

This addition of a new element has changed the name of the fire triangle to the “fire tetrahedron.” This fourth element is described as an uninhibited chain reaction. This chain reaction is responsible for the continuous heating of the fuel mass and the continuous production of vapors or flammable gases which the flames ignite.

As defined earlier, fire is often referred to as a rapid self-sustaining oxidation process usually accompanied by the evolution of heat and light of varying intensities.

Oxidation is an exothermic reaction which releases heat. An endothermic reaction absorbs heat. For an exothermic reaction to occur, combustible fuel and an oxidizing agent must come together. Fuel may be almost any material which has not been fully oxidized. Most materials are composed of carbon and hydrogen (hydrocarbons) which usually can be further oxidized. Most organic materials, flammable gases, and flammable and liquid gases contain large amounts of hydrogen and carbon.

**Air: The Most Common Oxidizer**

Air contains approximately 21 percent oxygen. Other materials may provide oxygen during combustion; these are known as oxidizing agents. Some examples of these oxidizing agents are sodium nitrate and potassium chlorate.

Under certain conditions, combustion can take place without oxygen being present, such as during the burning of magnesium. Such cases are somewhat rare and are not included here.
Only gases or vapors burn during open combustion. Solids and liquids do not actually burn. Actual burning occurs in the flammable gases released by the fuel.

**Flashpoint**

The flashpoint is the lowest temperature at which a flammable or combustible liquid produces enough vapors to form a flammable mixture at or near the surface of the liquid. This definition is based on experiments done in a laboratory.

Before we go any further, we need to clarify what we mean by *flammable* since the word is sometimes confusing. The word *flammable* means that something ignites easily, burns intensely, or has a rapid rate of flame spread. *Flammable* and *inflammable* are synonyms. The opposite is *nonflammable*, which describes materials less likely to ignite, burn, or have a rapid rate of flame spread.

Knowing the flashpoint of something can be critical in making the proper origin and cause determination. Earlier, we mentioned diesel fuel. The flashpoint of diesel fuel differs from that of gasoline. Knowing this might help an officer clearly distinguish between the right and wrong cause if an accelerant was used.

As with so many of the concepts discussed here, the informed officer is the one who knows the principles, can apply them when needed, and knows where to find the specific information to support his or her inquiries. No one could possibly memorize all the supporting information such as flashpoints. This is why we have reference manuals.

**Flammable and Combustible Liquids**

If we extend the definition of flashpoint to liquids, we come up with two more definitions:

A flammable liquid is any liquid having a flashpoint below 100°F.
A combustible liquid is one having a flashpoint at or above 100°F.

Once again, the informed officer will be able to use this concept with its related information to sort out possible accelerants. The magic line is 100°F.

**Ignition Temperature**

The ignition temperature is the minimum temperature to which a substance must be heated in air in order to ignite independently of the heated or heating element (self-ignition or auto-ignition).

Often *ignition temperature* is confused with *flashpoint*, but there is no relationship between the two terms. Some fuels that have very low flashpoints may have very high ignition temperatures. Here are two examples.

<table>
<thead>
<tr>
<th>Flashpoint</th>
<th>Ignition Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline</td>
<td>- 45°F</td>
</tr>
<tr>
<td>Kerosene</td>
<td>100°F</td>
</tr>
</tbody>
</table>

Careful observation will show quite a range in these two examples. The range between the flashpoint and ignition temperature of gasoline is 591 degrees to 908 degrees. The range for kerosene is only 310 degrees. The point is that in some cases knowing that this may be a factor can make a difference in your analysis of origin and cause.

**Flammable or Explosive Limits**

The next terms we need to look at are flammable or explosive limits. They form a range; that is, they have a lower limit and an upper limit.

These limits are the extreme concentration limits of a combustible or flammable gas in an oxidant through which a flame, once initiated, will continue to burn.
There are upper and lower percentages of an air-gas mixture in which combustion will be supported. A mixture below the lower limit is too lean to burn. A mixture above the upper limit is too rich to burn.

Here are some examples of the flammable limits of common accelerants or fuels. The figures are the percent of vapor in air.

- Gasoline = 1.4 to 7.6 percent.
- No. 1 fuel oil = .7 to 5.0 percent.
- Acetylene = 2.5 to 100 percent.
- Carbon monoxide = 12.5 to 74 percent.
- Hydrogen = 4.0 to 75 percent.

Note the very diverse ranges. For gasoline, it is only 6.2 percent. For acetylene, it is 97.5 percent.

**Specific Gravity**

Gravity is the weight of something based on the earth’s pull. Specific gravity is the weight of something compared to water, which is given a specific gravity of 1. The weight of the product will either cause it to float on top of water or to sink to the bottom. Gasoline has a specific gravity of .73, is lighter than water, and therefore floats. The specific gravity of asphalt is 1.4, and it will sink in water because it is heavier.

This is another basic fact which may make a difference in some situations involving a flammable liquid fire.

**Vapor Density**

Vapor density is the ratio of the weight of a volume of a given gas to an equal volume of dry air, air having the value of 1 (as
water did for specific gravity). This is used to determine whether a gas will rise or sink in the atmosphere. This, too, can be very important in determining origin and cause.

If a substance's vapor density is higher than 1, it will tend to sink or collect in low-lying areas. If it is lower than 1, it will tend to rise. A helium balloon tends to rise because its vapor density is lower than that of air. Some toxic gases like methane tend to hover close to the ground because their vapor density is higher.

**Solubility**

Solubility is the ability of a material to dissolve in water. A common example is alcohol. At a fire involving alcohol, such as at a tavern or distillery, we would expect that when the containers of alcohol break and spill their contents, the product will dissolve in the water. This could cause flammable liquid burns in unusual areas.

For certain types of fires, such as those with an alcohol base, a special type of foam must be used.

The following chart shows the flashpoint, ignition temperature, flammable range, and vapor density of some common fuels the company officer might run into in routine fires. One can find more extensive lists in most fire protection manuals or texts.
### Flashpoint, Ignition Temperature, Flammable Limit, and Vapor Density

<table>
<thead>
<tr>
<th></th>
<th>FP(°F)</th>
<th>IT(°F)</th>
<th>FL%</th>
<th>VD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetone</td>
<td>0</td>
<td>869</td>
<td>2.6 - 12.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Acetylene</td>
<td>Gas</td>
<td>581</td>
<td>2.5 - 100.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Anhydrous Ammonia</td>
<td>Gas</td>
<td>1204</td>
<td>16 - 25</td>
<td>0.6</td>
</tr>
<tr>
<td>Benzene</td>
<td>12</td>
<td>1040</td>
<td>1.3 - 7.1</td>
<td>2.8</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>Gas</td>
<td>1128</td>
<td>12.5 - 74</td>
<td>1.0</td>
</tr>
<tr>
<td>Ethyl Alcohol</td>
<td>55</td>
<td>689</td>
<td>3.3 - 19</td>
<td>1.6</td>
</tr>
<tr>
<td>Fuel Oil #1</td>
<td>100</td>
<td>410</td>
<td>0.7 - 5</td>
<td>---</td>
</tr>
<tr>
<td>Fuel Oil #6</td>
<td>150</td>
<td>765</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Gas (natural)</td>
<td>Gas</td>
<td>900 - 1170</td>
<td>3.8/6.5 - 13/17</td>
<td>---</td>
</tr>
<tr>
<td>Gasoline</td>
<td>- 45</td>
<td>536</td>
<td>1.4 - 7.6</td>
<td>3.4</td>
</tr>
<tr>
<td>Heptane</td>
<td>25</td>
<td>419</td>
<td>1.05 - 6.7</td>
<td>3.5</td>
</tr>
<tr>
<td>Hexane</td>
<td>- 7</td>
<td>437</td>
<td>1.1 - 7.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>Gas</td>
<td>752</td>
<td>4.0 - 7.5</td>
<td>0.1</td>
</tr>
<tr>
<td>Motor Oil</td>
<td>300 - 450</td>
<td>500 - 700</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Turpentine</td>
<td>95</td>
<td>488</td>
<td>0.8</td>
<td>---</td>
</tr>
<tr>
<td>O-Xylene</td>
<td>90</td>
<td>869</td>
<td>1.0 - 6.0</td>
<td>3.7</td>
</tr>
</tbody>
</table>

### Pyrolysis

Pyrolysis begins when fuel is heated. Pyrolysis is the chemical decomposition of matter through the action of heat. This process begins when fuel is heated: pyrolysis continues through specific stages. Let’s use wood as a fuel example.

Various gases slowly form during decomposition. The combustibility of these gases increases with the material's decomposition. The decomposition moves deeper into the fuel mass as the fuel surface is attacked and charring occurs.

Evolved gases ignite when they reach their lower flammable limit, assuming an ignition source is available. Ignition may be delayed if ignition energy (source) is not available.

Heat from an open flame starts the secondary pyrolysis reaction. Heat balance and heat feedback are important to
continued burning. A positive heat balance occurs when more heat is produced than is lost to heat conduction, convection, or radiation and the fire continues to burn. A negative heat balance occurs when most of the heat produced is lost to conduction, convection, or radiation, and the fire normally goes out.

Feedback of heat preheats nearby fuels and allows the fire to continue and spread.

Example

To illustrate the many physical and chemical processes involved in fires, we will use the ignition, burning, and eventual extinction of a wood slab in a typical fireplace.

Suppose the wood slab is heated initially by thermal radiation. As its surface temperature approaches the boiling point of water, gases (principally steam) slowly evolve from the wood. These initial gases have little, if any, combustible content. As the slab temperature increases above the boiling point of water, the “drying” process penetrates deeper into the wood interior.

With continued heating, the wood surface begins to discolor when the surface temperature approaches 575°F. This discoloration is visible evidence of pyrolysis, the chemical decomposition of matter through the action of heat. When wood pyrolyzes, it releases combustible gases while leaving behind a black, carbonaceous residue called “char.” This pyrolysis process penetrates “char” and continues deeper into the wood slab interior as the heating continues.

Soon after active pyrolysis begins, combustible gases typically evolve rapidly enough to support gas-phase combustion. However, combustion will occur only if there is a pilot sufficient to support a piloted ignition. If no such pilot is present, the wood surface often must be heated to a much higher temperature before autoignition occurs.
Once ignition occurs, a diffusion flame rapidly covers the pyrolyzing surface from direct contact with oxygen. Meanwhile, the flame heats the fuel surface and causes an increase in the rate of pyrolysis. If the original radiant heat source is withdrawn at ignition, the burning will continue, provided the wood slab is thin enough (less than 3/4 inch). Otherwise, the flames will go out because the slab surface loses too much heat by thermal radiation and thermal conduction into its interior. If there is an adjacent parallel wood surface (or insulating material) facing the ignited slab, it can recapture radiation loss, so that the ignited slab can continue burning even after the withdrawal of the initial heat source. This explains why one cannot burn a single large log in a fireplace, but must use several logs to recapture the radiant heat losses.

As the burning continues, a char layer builds up. This char layer, which is a good thermal insulator, restricts the flow of heat to the wood interior, and consequently tends to reduce the rate of pyrolysis. The pyrolysis rate also will decrease when the supply of unpyrolyzed wood runs out. When the pyrolysis rate decreases to the point of not being able to sustain gas-phase combustion, oxygen from the air will come into direct contact with the char, permitting it to undergo direct glowing combustion, provided the radiant heat losses are not too large.

The above discussion presumes there is an ample (but not excessive) supply of air (oxidant) for combustion. If there were insufficient oxidant to burn the available fuel vapor, the excess vapors would travel with the flow and possibly burn where they eventually find sufficient oxidant. For example, this happens when fuel vapors emerge and burn outside a window of a fully involved but underventilated room fire.

If, on the other hand, one was to impose a forced draft onto the pyrolyzing surface, the oxidant supply may exceed that required for complete combustion of the fuel vapors. In this case, the excess oxidant can cool the flames sufficiently to suppress their chemical reaction and extinguish them. This
happens, for example, when one blows out a match or candle. In the case of larger fires with ample supply of fuel vapors, blowing on them simply increases their rate of burning by increasing the flame to fuel-surface heat transfer, which in turn enhances the fuel supply rate.

Following the ignition of a certain portion of our wood slab, the flames are likely to spread over the entire fuel. Flame spread can be thought of as a continuous succession of piloted ignitions where the flames themselves provide the heat source. One commonly observes that upward flame spread is much more rapid than downward or horizontal flame spread. This is because hot flames generally travel upward and distribute their heat over a greater area in an upward direction. Thus, each successive “upward ignition” adds a much greater burning area to the fire than a corresponding “downward or horizontal ignition.”

Generally, materials which ignite easily or rapidly also propagate flames rapidly. The ignitability of a material is controlled by its resistance to heating (thermal inertia) and the temperature rise required for it to begin to pyrolyze. Materials with low thermal inertia, such as foamed plastics or balsa wood, heat up rapidly when subjected to a given heat flux. These materials are often easy to ignite and can cause very rapid flame spread. On the other hand, dense materials such as ebony wood tend to have relatively high thermal inertia and are difficult to ignite.

The burning rates of larger, more hazardous fires are principally governed by the radiant heat transfer from the flames to the pyrolyzing fuel surface. The flame radiation comes primarily from the luminous soot particles in the flames. Combustibles which tend to produce large amounts of soot or smoke (such as polystyrene) also tend to support more intense fires, despite the fact that their fuel vapors burn less completely, as evidenced by their higher smoke production.
Activity 7.2:
Predicting Fire Behavior
Student Activity Worksheet

Time: 30 minutes

Purpose:
To apply the principles of fire behavior to a simulated emergency response. From the scenario, you will be able to make predictions about fire behavior.

Directions:
1. Your instructor will divide the class into small groups. Appoint a spokesperson to report your group’s findings at the end of the activity.

2. Read the scenario and answer the questions.

3. After 15 minutes, you will report your answers.
Scenario:
The temperature is 62°F on a clear day. There is no measurable wind and the time is 1830 hours.

A tank truck carrying 8,000 gallons of gasoline was coming down a hill into town when the driver lost control of the vehicle. The truck overturned on Main Street and spilled part of its contents. The contents ran down Main Street and into the basement of the post office. The post office had a gas-fueled hot water heater in the basement. Soon afterward, there was an explosion, and three buildings, along with the truck, were involved in fire.

As you approach the scene, you observe a large cloud of heavy black smoke and dark red flames. The exterior walls of two dwellings and the entire one-story post office are involved. The post office walls are partially blown from their foundation.

During extinguishment, you observe that the burning gasoline is floating down the street on top of the water. You also are informed that gasoline vapors in the storm sewer are above 40 percent but have not ignited.

No one was injured during the incident.
Questions:

1. Is the gasoline at or above its flashpoint?

2. Is the gasoline at or above its ignition temperature?

3. Is the gasoline vapor in the storm sewer within its flammable limits?

4. Why did the gasoline float on top of the water?
5. Why did the gasoline vapors collect in the storm sewer down the street in an area lower than the leaking tank truck?

6. What could have been the ignition source for the spilled gasoline?

7. What evidence may indicate that the fire may have started in the basement of the post office?

8. If the tank had been loaded with diesel fuel, would you have expected the same results?
Rate of Heat Release

Heat is measured in British thermal units (Btus). One Btu is the amount of heat required to raise one pound of water one degree Fahrenheit at 60 degrees. The total number of Btus which might evolve from a fire becomes important in relation to fire load and the amount of damage in the structure.

Once again, it is important to underscore that the knowledge of this technical point is not what matters; what counts is the officer's ability to use this knowledge with all of the other bits of information at the scene.

Having some sense of the number of Btus produced by various combustibles may be important information when related to the damage inflicted on a structure.

The following chart shows the number of Btus produced by the combustion of various materials.

<table>
<thead>
<tr>
<th>Product</th>
<th>Btu/lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood</td>
<td>7,000</td>
</tr>
<tr>
<td>Polyurethane</td>
<td>14,700</td>
</tr>
<tr>
<td>Polyvinyl chloride</td>
<td>17,900</td>
</tr>
<tr>
<td>Polystyrene</td>
<td>18,750</td>
</tr>
<tr>
<td>Polypropylene</td>
<td>20,000</td>
</tr>
<tr>
<td>Polyethylene</td>
<td>20,100</td>
</tr>
</tbody>
</table>

With the discussion of Btus, we come to the end of this first section dealing with some basic principles of fire science. To repeat, the purpose is not to make the officer and firefighter fire experts. The goal is to make the initial responders more aware of some of the principles that underlie the origin and spread of fire. This knowledge will, in turn, help the responders make more accurate determinations as to origin and cause.
Reaction of Fire to Water Application

This is an important aspect of fire suppression and a critical observation the fire officer can make in terms of fire cause determination. Normal items in today’s environment will produce a significant amount of heat. The application of the appropriate amounts of water should cause the fire to diminish and go out. If the fire does not react as one has seen at previous, similar fires, naturally one should be curious as to the reasons.

A common reason might be the use of an accelerant. Another could be the combustion of a substance that burns hot and fiercely when water is applied. Whatever the case, this fact could be another clue that will help figure out the correct answer.

Heat Transfer and Temperature Factors

The properties of heat are such that its route of travel and method of transfer can reveal interesting information about the origin and cause. Therefore, it is a critical evaluation while making a fire cause determination.

As the fire travels from room to room or from one portion of a building to another, the methods of travel should be fairly obvious. This observation is critical to determine if the fire was spread intentionally with devices such as accelerants, trailers, or separate fires.

There are three methods of heat transfer.

**Conduction** is the transfer of heat by direct contact of one body with another. There are many examples of heat transferred and the spread of fire from involved to uninvolved areas by heating some structural element. Some common examples include:

- Pipes and other conduits;
- Steel structural members; or
• Walls, doors, ceilings, or floors.

**Convection** is the transfer of heat by some circulating medium, either gas or liquid. This form of heat transfer is the one most responsible for fire spread in structures.

An example of heat transfer by convection is the spreading of fire from lower to upper structural areas when the upper areas become heated to their ignition temperatures.

**Radiation** is the transfer of heat from one area to another without direct contact, and without any circulating hot gases to help “bathe” the area in heat. It is heat in the form of energy that travels through space or materials as waves, as when the sun warms the earth. An example of heat transfer by radiation is an exposure fire.

Structural fires usually involve all three types of heat transfer or combinations of all three. Being able to differentiate one from the other may be critical for the officer in working a cause and origin determination.

Observing fire spread may be vital to reconstructing where the fire started and how it traveled to another location. Certain fire travel predictions also can be made for some classifications of buildings.

Consider the following example. A fire starts in the basement of a wood-frame balloon construction building. Shortly after, the fire appears in the attic. This may be a result of convected heat traveling up through open wall cavities to the attic level and igniting combustible materials.

Many fire officers may quickly and erroneously assume that the second fire was the work of an arsonist.
Flashover and Backdraft

There are two very important and related topics that we need to look at now. A clear understanding of each and the ability to recognize their signs play an important part in accurate origin and cause determination.

Flashover

Flashover can be defined as the state of a fire when a room or other area becomes heated to the point when flames flash over the entire surface of the room or area simultaneously.

Flashover is caused when heat produced by the fire collects at the ceiling level and returns to lower areas by thermal radiation. Combustible materials are heated to their ignition temperatures and fire flashes over large areas.

A more recent term used to describe the rapid spread of flame over one or more surfaces is “flameover.” This should not be confused with flashover.

Flashover may cause the area to appear to have been exposed to flammable accelerants. However, during the fire scene examination, discovery of the following would indicate flashover rather than the use of an accelerant:

- Burning over top surfaces of materials,
- Lack of normal fire spread from point of origin,
- Lack of accelerant residue, and
- Demarcation line around the area.

The other related term is backdraft.

Backdraft

Backdraft is the explosion or rapid burning of heated gases that results when air is admitted to a building heavily filled
with smoke from a fire that has depleted the oxygen content of the building.

What causes a backdraft? Carbon monoxide is one of the major components of most structural fires, and it is highly flammable (explosive limits = 12.5 to 74 percent). The ignition temperature of carbon monoxide (1,128°F) is well below the normal temperatures found at ceiling levels of most structural fires. The carbon monoxide usually collects at the upper areas of a fire-involved structure, and the introduction of air (oxygen) from below frequently results in an air-to-carbon monoxide mixture within the flammable range.

Backdraft explosions often cause injuries to firefighters. Knowing this fact will play an important role in fire scene investigation. Interviews with the fire personnel who were present at the scene are critical. Information that should be obtained includes the following items.

- What was the extent of smoke at the time of arrival?
- Was there a lack of visible flame or presence of blue flames?
- What method was used to open or enter the structure?
  * Was there venting of the roof before entry to help eliminate smoke?
  * Did entry before venting provide oxygen and possibly produce a backdraft?
- Was there movement of smoke immediately preceding the explosion?
  * Smoke may appear to change its direction of travel.
  * The structure may appear to breathe.
* There may be sounds like a whistle, a jet, or a train before the explosion.

Backdrafts also can occur during the later stages of the fire if pockets of smoke remain after venting.

Classes of Fire
As part of a fire scene examination, one should note the methods of extinguishment. A question to ponder is whether the proper extinguishment was used for the type of fire that occurred. There are four classes of fire with which every officer should be familiar.

Class “A” fires are those fires involving ordinary combustible materials or materials which produce an ash or glowing coals. Some common examples are wood, paper, cloth, and rubber.

Class “B” fires are those fires involving flammable or combustible liquids. Some common examples are gasoline, kerosene, fuel oil, and alcohol.

Class “C” fires are those fires involving energized electrical equipment.

Class “D” fires are those fires involving certain combustible metals. Some common examples are magnesium, titanium, sodium, and potassium.

Normal Fire Behavior
Fires usually will go through at least two stages. If the building is tightly closed and remains closed, it may go through a third stage and eventually self-extinguish. Knowing the stages and being able to distinguish each is another important skill for the officer.
The Incipient Stage

This is the first or beginning stage. All fires start with a single point of ignition and expand from that point. A class B fire (flammable liquid) expands rapidly, while a class A fire expands slowly. As a class A fire starts, the fire gases and heat start to rise upward and outward. This often will be referred to as the “V” pattern with the bottom of the “V” pointing to the area of fire origin. The hotter and the faster the fire, the narrower the “V” pattern.

Class A fires can accelerate with flammable liquids and also can have their normal fire patterns altered. As the fire burns, it also produces a wide variety of fire gases.

Carbon monoxide (CO) is not the most toxic fire gas, but it is the most abundant. As the oxygen level goes down, the production of CO goes up. Carbon dioxide (CO₂) also is produced in every fire.

Two other commonly produced gases are hydrogen sulfide (H₂S), made when organic materials containing sulfur burn (such as hair and wool), and benzene (C₆H₆), produced when vinyl materials burn.

Free-Burning Stage

This is the second stage. It follows flashover of the area or building, which now appears to be fully involved. In accidental fires this stage typically will occur in about 3 to 5 minutes from the time of ignition.

The type of fuel or arrangement of the fuel may affect the time it takes the fire to develop fully. A fire accelerated with a flammable liquid or other methods, such as a trailer device of combustible materials arranged to quickly cause fire spread, may alter this normal fire growth and the normal three to five minute growth pattern.
Smoldering Stage

When a fire has passed through stages one (incipient) and two (free-burning), it will likely smolder if the area or building is closed.

For this to happen, the oxygen level must fall to 16 percent or lower. The free-burning phase is reduced, and the fire may retreat to its area of origin (most heavily burned part) and continue to smolder for a long while.

Various things happen during the third state of burning:

- Carbon monoxide production rises.
- The temperature of the area or building rises.
- Large amounts of heavy black carbon are deposited on the walls and windows.
- Moisture may appear on the inside of the window glass as the outside air cools the glass.
- The building may appear to be puffing and breathing.
- Smoke may appear around windows, through the siding, or through the roofing materials.

From this one can infer that the level of the structure where the smoke stops puffing is probably where the seat of the fire is. If there is puffing smoke on the second floor but none on the first, the area of fire origin may well be located on the second floor. This is not an absolute, but is a good rule of thumb.

If the area or building remains tightly closed, eventually the fire will suffocate from lack of oxygen. In some instances, fire departments have responded to an apparently significant fire which has gone out by itself after causing considerable heat and smoke damage.
As buildings are tightly constructed and insulated, the potential for stage three fires increases.

Combustion Byproducts

Four categories of combustion byproducts are produced as the result of combustion. They are gases, heat, flames, and smoke. We need to discuss each of these and how they relate to fire behavior.

Fire gases produced in most fires depend on variables including the chemical makeup of the burning materials, the available oxygen during burning, and/or the temperature of the fire and the fire area.
The toxicity of these gases is determined by variables such as the concentration (percent) of gas in air, the length of exposure, and the physical condition of any victims.

The toxic effects on personnel are greater during the fire because of increased respiration by the victim from exertion, heat, and excess carbon dioxide. What ordinarily appear to be harmless amounts of toxicity may become dangerous during the fire.

Here are some examples of common toxic fire gases.

**Carbon monoxide (CO).** This is considered the most dangerous in most fires. CO is not the most toxic, but it is the most abundant. The amount being produced can increase as available oxygen decreases.

**Carbon dioxide (CO₂).** This gas is usually produced in large amounts in most fires.

**Hydrogen sulfide (H₂S).** This gas is often produced by the incomplete combustion of organic materials containing sulfur. Some examples of materials which may release hydrogen sulfide are wool, rubber, hides, meat, and hair.

**Ammonia (NH₃)** is often produced by the burning of combustible materials containing nitrogen. Examples of materials which may release ammonia are wool, silk, acrylic plastic, and melamine resins.

**Hydrogen chloride (HCl)** is often produced by the burning of combustible plastic containing chlorine. Polyvinylchloride (PVC) is the most notable example of materials that release hydrogen chloride.

**Nitrogen dioxide (NO₂)** is the gas often produced by the decomposition and combustion of cellulose nitrate in fires involving ammonium nitrate and other inorganic nitrates.
When in a combustion stage, this gas can often be identified by a reddish-brown smoke or vapor. The toxic effect may be delayed for up to several hours.

**Acrolein (CH$_2$:CHCHO)** is often produced by the combustion of petroleum products.

Other fire gases which are usually found only in small quantities in most fires are hydrogen dioxide, hydrogen cyanide, and phosgene.

**Flame, Heat, and Smoke**

Flame results from the burning of most materials in an oxygen-rich atmosphere. This produces luminosity (flame). Therefore, flame is considered a byproduct of combustion.

Heat is the byproduct which is most responsible for the spread of fire in buildings. The presence of moisture in heated air increases the danger and the damage.

Smoke consists of very fine solid particles and condensed vapor. Gases that are produced by the heating of combustible materials are contained in flammable tar droplets and carried upward with the thermal column. Very little smoke is produced during complete combustion. As combustion diminishes, the smoke density increases.

**Oxygen and Fire**

Air contains 21 percent oxygen. Without an air supply, insufficient oxygen often results during combustion. Flaming combustion usually ceases when the available oxygen is less than 16 percent.
Activity 7.3:
Stages of Burning
Student Activity Worksheet

Time: 45 minutes

Purpose:
To provide the opportunity to determine various stages of fire progression. The ability of a fire officer to read a fire accurately is not only critical to the fire-suppression efforts, but to the fire cause determination and fire origin efforts as well.

Directions:

1. Your instructor will divide the class into small groups. Your group should select a spokesperson to report your findings to the class.

2. Your group will read the three fire scenarios and determine the stage of fire progression.

3. You will have 10 minutes to discuss each scenario and determine the stage of fire progression.

4. Your instructor will ask you to provide answers and describe what factors led to your decision.
Scenario 1

A fire has occurred in a two-story, wood-frame, single-family dwelling of balloon-type construction.

The area of fire origin appears to be around the bed of the master bedroom. There is heavy fire damage in the bedroom and especially around the bed. The family states that it had left to go shopping approximately 5 minutes before the fire.

The bedroom door where the fire started was open, as were the doors of the three other bedrooms on the second floor. All of the bedroom walls had been finished with wood paneling. The fire had spread from the room of origin to all the other second-floor bedrooms before fire department arrival. Upon your arrival, flames are coming out of several windows and the fire has burned through the roof over the master bedroom.

Questions:

1. At what stage was the fire upon your arrival?

2. Are there any unusual circumstances that would require further investigation?
Scenario 2

The building is a one-story, wood-frame, platform-type construction. It was built in 1993 as a single-family unit.

The fire started in a pile of newspapers and spread to an overstuffed easy chair placed against the living room wall. From there a very distinct “V” pattern is recognized in the char pattern on the wall. In the fire debris next to the chair are the broken remains of a glass ashtray.

The occupant stated that he had not smoked for at least 12 hours and was very careful about extinguishing his cigarettes. He was at work and had left the dwelling about 3 hours earlier.

A neighbor had called the fire department to report something unusual next door. The windows appeared to be dark and she thought she smelled smoke in the area.

Upon your arrival, you observe darkened window glass that is hot to the touch, a light puffing around the eaves, and the strong odor of smoke.

Questions:

1. At what stage was the fire upon your arrival?

2. Are there any unusual circumstances that would require further investigation?
Scenario 3

Your dispatcher has sent you to investigate a report of three boys playing in a garage. They were seen lighting small pieces of paper and then stepping on them to put them out.

As you approach the address, you observe three boys running from the garage and into a neighboring home. From the driveway, you observe a small amount of gray smoke coming from the partially opened side door. Upon entering the garage, you see a fire that involves the workbench area and the wall behind the bench. There is no electrical equipment on the bench area or other sources of ignition nearby.

Questions:

1. At what stage was the fire upon your arrival?

2. Are there any unusual circumstances that would require further investigation?
Module Summary

Careful and methodical observations on the part of the company officer and firefighters probably will play a big role in helping to make a determination of origin and cause. The observations made at the time of the alarm and during response, size-up, suppression, and overhaul will contribute a vast amount of useful information. Later, this information will be sorted out and evaluated to see which parts can help determine origin and cause.

This early part of the process cannot be underestimated and cannot be done too carefully. In many ways, it can make or break the ultimate investigation.

The time spent on collecting, recording, and analyzing this information is well spent. It can make all the difference if there is litigation later. Even if there is no litigation, there will be satisfaction from the knowledge that you were able to make a final determination on origin and cause.

As mentioned a number of times during this module, the officer does not need to memorize a lot of information to function effectively at the fire scene. What is required is a good grasp of some of the basic fire principles and how these affect an accurate origin and cause determination.

This module has presented the major fire principles to help the officer avoid making some erroneous conclusions by misreading the facts.
MODULE 7

APPENDIX

FIRE BEHAVIOR CHECKLIST
Fire Behavior Checklist

This checklist is provided to help the company officer and firefighters evaluate various aspects of fire behavior that may be critical to the fire cause and origin determination.

1. What material first ignited? __________________________________________________________

2. Complete the following if the materials involved a liquid.

   Flashpoint of material: ____________________________

   Vapor density compared to air: ____________________________

   Specific gravity compared to water: ____________________________

   Solubility in water: [  ] yes [  ] no

   Flammable limits: ____________________________

   Flammable or combustible liquid: [  ] yes [  ] no

   Ignition temperature of material: ____________________________

3. Should the flammable/combustible liquid have been where it was at the time of the fire? [  ] yes [  ] no

4. Was the heat released from the burning material what you would have anticipated for this type of occupancy? [  ] yes [  ] no

5. How did the fire react when water was applied?

   __________________________________________________________

   __________________________________________________________

   __________________________________________________________
6. Was the fire extinguished with the amount of water normally applied for similar fires in similar occupancies? [ ] yes [ ] no

If no, how much more was needed? ________________________________

7. Is the path of fire travel clearly defined by obvious paths of fire travel or evidence of fire progression upward and outward from the area of fire origin? [ ] yes [ ] no

8. What stage was the fire in upon your arrival?

[ ] Stage one: incipient fire
[ ] Stage two: free-burning
[ ] Stage three: smoldering

9. Did a backdraft occur or is there any evidence of a backdraft?

[ ] yes [ ] no [ ] unsure

10. Was there anything that appeared different at this fire than at other fires you have responded to recently?

[ ] yes [ ] no

If yes, explain. _____________________________________

11. Were there any eyewitness accounts of the fire origin or cause? [ ] yes [ ] no

If yes, does this appear to be consistent with your observations about the origin and cause of the fire? [ ] yes [ ] no

Explain. ________________________________________________

____________________________________________________________________________________
Fire Scene Observation Notes

Sketch of the Fire Building
MODULE 8

SLIDES
Chief Officer Training Curriculum

Operations
Module 8:
Fire Cause Determination II

Objectives

♦ Identify kinds of information necessary to document a fire
♦ Determine exterior signs critical to locating area of fire origin
♦ Determine interior signs that help determine area of fire origin

Objectives (continued)

♦ Identify the most common building elements that may help pinpoint fire origin and cause
♦ Determine when to call a fire investigator to conduct investigation
Overview

Understanding importance of gathering facts and data pertinent to fire incident
Making a systematic examination of a fire scene to determine the origin and cause of the fire

Importance of Fire-Related Information

Officer responsible for collecting scene information or ensuring it is collected
Information serves many purposes
– Helps determine origin and cause
– Provides data for reports
– Contributes to permanent record

Collection of Information

Facts about owner or occupants
Facts about injuries to owner or occupants
Facts about person discovering fire
Collection of Information (continued)

♦ Facts on building’s use if use is abnormal
♦ Problems in structure before fire
♦ Use of portable heating devices
♦ Known facts on fire’s origin

Collection of Information (continued)

♦ Changes in daily routine of occupants
♦ Description of building
♦ Conversations

Officer’s Role in Determining Fire Origin

♦ May be first on scene and may be Incident Commander
♦ May make decision to call investigator
♦ May make decision to delay overhaul
Considerations for Delay of Overhaul

- Possible destruction of evidence and disruption of scene
- Need to photograph or videotape scene
- Possible evaporation of flammable liquid residues

Organizing the Fire Cause Determination Effort

- Outside to inside
- Least damaged to most damaged

Exterior Examination

Examine all sides of the structure:
- Determine construction type
- Estimate age of structure
- Note areas of most damage
- Note where fire exited building
Age of Construction and Types of Materials

Areas of Greatest Damage

Observation of “V” Patterns
Observe “V” Patterns (continued)

- Small patterns may appear at windows or doors
- Larger patterns appear where fire burned most
- Patterns near chimney may indicate chimney fire

Security Before Fire

- Forced or broken windows

Signs of Forced Entry
Unusual or Atypical Aspects

- Fuel containers not where they should be
- Repair work in progress: scaffolding or ladders
- Outside electrical equipment

Activity 8.1: Exterior Fire Scene Examination

Scenario One Photo
A separation wall extends from the first floor to the roof deck.
**Interior Examination**

- Work backwards systematically

---

**Least-Damaged to Most-Damaged Area**

---

**Survey Structural Elements**

---
Extensive Floor Damage

Nonstructural Building Components

♦ Lowest level of burning

Examine Nonstructural Components

♦ Shelving
♦ Light fixtures
♦ Glass
♦ Melted objects
♦ Doors
**Burn Indicators Involving Shelving**

**TOP**

**BOTTOM**

- Ops 8-34

---

**Incandescent Light Bulbs**

- Ops 8-35

---

**Smoke Residue**

- Ops 8-36
Evenly Heated Bulb

Small Rupture

Ruptured Bulb Without Clue
Smoke-Stained Glass

♦ How much and what kind of stain is there?
♦ Are the stains baked on?
♦ Do the stain smudges come off easily?

Smoke Stains on Glass

♦ Compare smoke-stained glass

Light Smoke Stain
Heavy Smoke Stain

Cracking or Crazing of Glass

Small Cracking or Crazing
Large Cracks

Melting Points for Metal Objects

- Aluminum: 1,218 degrees
- Copper: 1,981 degrees
- Gold: 1,945 degrees
- Lead: 625 degrees
- Silver: 1,761 degrees

Doors Can Provide Clues
Lowest Level of Burning

Drop Down of Material
Examination of Building Contents

- First impression
- Items that do not seem to belong
  - Items moved before the fire
  - Substitution of items
  - Unusual arrangement
  - Missing clothing, jewelry, photographs
- Items appeared out of place
  - Furniture rearranged to block doors

Burn on Top Compared to Bottom

High Fuel Load
Examination of Appliances

- Were they connected to the power source?
- Were they turned on?
- Are they in the likely area of origin?

Damage to Cabinets

Additional Heating Sources
“V” Patterns

Wind Direction Affects “V” Pattern

Narrow “V” Pattern
Wide “V” Patterns

Patterns on Top of Furniture

“V” Patterns at Base of Wall
Burning on Walls

Block Normal Travel of Fire

Activity 8.2: Reading Fire Patterns
Module Summary

Information necessary to document fire:
- Facts about owner or occupants
- Facts about injuries
- Facts about person discovering fire
- Facts about building and structure
- Known facts on fire's origin
Preliminary origin and cause determination:
- Exterior examination
- From least damaged to most damaged
- Interior examination
  - Structural elements
  - Contents
  - Fire patterns
MODULE 8

FIRE CAUSE
DETERMINATION II
MODULE 8:

FIRE CAUSE DETERMINATION II

Objective
Upon completing the module, you will be able to conduct exterior and interior examinations of a fire scene and read fire patterns to help determine the area of fire origin and fire cause.

Methodology
This module uses lecture, discussion, and activities.

NFPA 1021 Standards Cross-Reference Matrix
3-5, 4-5
Introduction

The aim of this module is to discuss the basic responsibilities of the chief officer in determining the area of fire origin and the fire cause.

This module presents basic considerations for the officer who makes a systematic examination of a fire scene that involves conducting a thorough exterior examination before conducting a thorough interior examination. Emphasis is on moving from areas least burned or damaged to those most burned or damaged.

The module has two scenario-based group activities that apply the concepts presented in the module.

Importance of Fire-Related Information

The fire officer and firefighters play an important role in gathering evidence at a fire scene. Collecting information related to the fire incident starts at the time of alarm and continues until the close of the fire cause determination.

In some instances, the collection of information may start before the alarm. Records such as fire code violations, existence or lack of building permits, or other official records may become important to the cause determination process.

The fire officer gathers information that may be used for several purposes. Someone needs to complete an official fire report, a fire cause determination that will require another report, and possibly a media statement. All of these reports have one thing in common: they will become official documents that someone may subpoena; they become available under freedom of information laws; or they may become very important to the owner or insurance carrier of the property.
Collection of Information

After the fire has been brought under control, the fire officer should start a systematic collection of information. Information will cover several areas, such as:

- Information about the owner;
- Information about the occupancy and activity before the fire;
- Information about the discovery of the fire;
- Information about the circumstances of the area of fire origin and cause;
- Information about the structure, including building classification and type, use prior to the fire, and unusual aspects that may have caused the fire to spread;
- Information about your observations, including the damage to the property and its contents; and
- Information about witnesses, conversations, or unusual events.

Owner and Occupants

The owner’s name and address (if different from the fire location) are important in order to establish who is responsible for the property. If the owner does not occupy the property, any information on ownership from the occupants would be helpful. In some cases, the tenants may know only who collects the rent; they may have no idea who actually owns the property. A search of property records can help determine the legal owner. The property manager of large buildings or apartment complexes with multiple occupants should be able to provide the needed information.
The officer also needs to identify the occupants of the area where the fire appears to have started. List the relationships of the occupants such as husband, wife, and children; include names and ages of all persons. In some cases, the list might also include a visitor. Here, too, all names are needed. In addition, the officer needs to get the exact address of the structure, the apartment or unit designator, if applicable, and the telephone numbers of the persons involved.

If the structure is uninhabitable because of the fire, it is important to get information on where the displaced persons will be staying because there may be a need to track them down a few days later. Obtain the name, address, telephone number, and relationship of the person with whom they will be staying. If fire victims are unsure of a temporary address, the officer should inform them that they should contact the fire department with this information as soon as possible. If available, give them a business card.

Person Discovering the Fire

The person who discovers the fire may be the only one who can describe the location of the fire in its incipient stage and the path of travel it followed. The persons with the best first-hand information are usually the person or persons who discovered the fire, the first fire officer on the scene, and the initial fire attack crew. Use the observations of the individual(s) who discovered the fire to assist in determining the fire cause and origin. Get names, addresses, and telephone numbers of such individual(s). Determine exactly what the discoverer witnessed and, if it appears that the information is critical, invite that person to the fire department to give an official statement.

There are several critical questions to ask the person(s) who discovered the fire:

- Where were you when you discovered the fire?
- Why were you there?
Did you call the fire department? Whom else did you notify?

What did the flames and smoke look like?

Do you know who the last person in the room or area of fire origin was and how long he or she was there before the fire?

Did you see the fire spread? If so, how did it spread?

Do you recall if there were any windows or doors open at the time of the fire?

If the building is not used as a dwelling, other questions need to be answered. The following list is not exhaustive, but is meant to suggest some of the most important questions.

What was the building used for, and who used it?

What type of work was performed there?

What was commonly stored there? Were there any flammable or combustible contents?

If so, were there any special storage cabinets provided?

What type of machinery was in the area of fire origin? Was the machinery operating at the time?

Can it be verified that such machinery was off? Who normally turns the equipment off?

Who secures the building, and who else has keys to gain entry?
Problems Before the Fire

- Were there any problems before the fire?
- Was all of the equipment operating properly?

It is too easy to get reports that “the light didn’t work properly” or “the toaster was partially broken” or “the fuse was always blowing.” These pieces of information are not the most helpful. Ask specific questions, such as “Were there any repairs underway at the time of the fire?” and “Who was doing the repairs?”

Portable heating devices are the source of many accidental fires. Items such as heaters, hair dryers, paint-stripping devices, torches to repair plumbing or roofs, and other similar types of heat sources are found to be the source of many fires. Questions about these devices are also important.

Observers

Information about the cause of the fire is often available from the persons in the area of the fire at the time of its origin. If there are observers, it is important to have them give their accounts of the events that caused the fire. Encourage them to talk and listen without interruption. Take notes. If necessary, ask for further explanations of items that are not clear. If they have pertinent information, they can come to the fire station to make a formal statement.

However, until a person becomes a suspect, it is not necessary that the person be informed of his or her legal (Miranda) rights. It is wise to check with the District Attorney to determine local policy, and to get an official interpretation on interviewing versus interrogating a person.

The Structure

The description of the building is an important part of the information collection. The approximate size, the number of
stories, unique features, the existence or absence of a basement or attic, and the type of construction are all important considerations.

A description of the extent of fire damage is especially important. Many fires have occurred that involved only a small area, but when the insurance investigator arrived, the damage was far greater than that witnessed by the fire department. The description should include items such as broken windows; the condition of the doors, walls, and ceilings; and any damage that had obviously occurred before the fire.

**Conversations**

Conversations may reveal a great deal and are therefore sometimes very important. Often, the firefighter left to handle the operation of the pump may talk casually with persons who have information about the fire. For example, one pump operator may tell the time he encountered a person who emerged from the crowd gathered at the scene and told the operator that he did not mean to cause the fire. He was only trying to get warm, he said. Information such as this should be passed on to the officer in charge.

Such pieces of information are but a few of the major pieces an officer can begin to collect and record at the scene of a fire. Each piece in itself is not critical, but when taken into consideration with other information, they can reveal a great deal.

**The Incident Commander’s/Chief Officer’s Role in Determining Fire Origin**

The starting point to determine the cause of any fire is first to find out where the fire started. While this process may seem at first like a hopeless task, the fire, in fact, leaves many clues that can help complete this task. The trick is to be able to find the clues and interpret them correctly.
The process consists of a systematic approach to the fire scene, working from the outside to the inside and from the least burned area to the most severely burned area. During the process, the officer examines and evaluates items such as charred door frames, carbon deposits on or cracks in window glass, patterns that form a “V,” and other very distinct burn patterns.

The fire officer’s role is to prepare resources for emergencies, perform rescues, suppress fires, and lead the company in performing a wide variety of other emergency services.

In addition to all of the duties done on a regular basis, the fire company may also be responsible for determining the origins and causes of the fires to which they respond. If they are not responsible, in the strict sense of the word, for origin and cause determination, they at least play an important supporting role in making such determinations. As was stated earlier, from the moment the alarm comes in to the end of overhaul, the firefighters are in the best position to observe things.

Many smaller fire departments do not have the luxury of a fire investigator who can respond to every call, and access to someone from the state fire marshal’s office may be limited for all kinds of reasons, such as distance and staffing levels. Therefore, the fire officer is the one who must conduct an initial examination to try to make a preliminary determination of origin and cause.

When the fire officer determines that the fire resulted from an accident, the search for the origin and cause may stop at that point. If, however, the fire officer is unable to locate a cause of the fire, determines that the circumstances are unusual, or finds evidence that the fire was of an incendiary nature, he or she has one course of action: summon a fire investigator.

After fire suppression, the fire officer must decide quickly if overhaul can begin or should be delayed so that fire origin
and cause determination can start. This is not a choice to be made quickly or casually. A hasty decision to overhaul may result in some valuable indicators being disturbed or even thrown out.

In many instances, the decision to overhaul will come after the fire officer makes a preliminary determination of the most likely area or room of fire origin. This area or room should generally be the last overhauled in order to provide the maximum time and best opportunity to conduct a proper and thorough fire origin and cause determination.

If the overhaul must absolutely start, the fire officer must determine how best to protect the suspected area to make a proper examination later. This protection may involve placing salvage covers down so that the plaster, ceiling tile, or other fire debris that will be removed during the overhaul process is caught and removed without causing further damage or destroying helpful indicators.

The most helpful indicators and information during the fire cause determination effort will generally be found at or near the floor. Distinct burn patterns on walls should remain where they are and as they appear. Removal of wall materials such as wall coverings and decorations should be delayed as long as possible. Burn patterns are often a valuable clue in determining where the fire started or how it traveled through the room.

**Organizing the Fire Cause Determination Effort**

The fire cause determination effort will first require the fire officer to locate the area or point of fire origin. Only after that can he or she look for the cause. To walk about looking for fire causes before finding the origin can often lead to ambiguous results. Doing so may lead one to fires that were actually caused by the original fire or material that was a victim of the fire. For example, it is normal to observe several beaded electrical wires in a structure that has undergone significant burning. To conclude that the first beaded wire
found is the cause of the fire is probably faulty reasoning. One must avoid this pitfall at all costs. If a systematic method of fire cause determination is used, however, one first locates the area or point of origin of the fire and then tries to pinpoint the cause of the fire.

**Exterior Examination**

The process starts on the exterior of the structure. In large fires or large structures, this process may require making two or three circular passes or inspections around the structure. Each pass moves closer and closer toward the structure itself. Being too close will sometimes cause one to miss obvious signs such as large “V” patterns. A distance view of the structure will normally offer a bigger picture of the damage.

The officer needs to examine the area for evidence of exterior ignition sources. Look for signs of lightning or for fire spread from the outside to the inside. Keep a wary eye out for any indications of exterior fire, heat, or smoke damage. The officer also needs to pay particular attention to evidence of incendiaryism: look for indications that someone used a flammable accelerant. Downward burning on a surface, such as on a door or beneath a window, may indicate the use of an accelerant. Looking for accelerant liquid containers or containers that could be used to carry an accelerant liquid is an important step in the exterior inspection.

Note any sign of forcible entry. If suspicious, the officer needs to confirm entry damage by other than fire department personnel or other than the owner or occupant trying to fight the fire or rescue someone trapped inside.

Finally, the officer needs to look for signs of individuals having traveled in the area. Footprints or tire tracks are good indicators that not all may be normal.

The officer might follow the example of many experienced fire investigators who will often use an aerial device to get high above the fire to look for clues such as the area with the
most fire damage. Observing a hole in the roof from the ground provides a limited view. Getting an aerial view may be much more helpful and revealing.

After inspecting the exterior, the officer is ready to examine the interior. The examination should progress from the least burned area toward the area of greatest damage. This process continues until one arrives at the area of greatest fire damage. Often this is the area of fire origin because it is the place where the fire burned longest.

One needs to be very careful here, however. The use of liquid accelerants in the spread of the fire may cause similar burning patterns and heavy damage, but the liquids also will leave clues that one should be able to recognize readily.

“V” Patterns

The familiar “V” fire pattern is often one of the most valuable clues in determining the area or point of fire origin. The normal fire that starts near a wall will leave a distinct pattern on the wall near the fire. As the fire burns it will progress upward and outward from the point where it started. If left unchecked, the fire will eventually reach the ceiling where the heat, flames, and fire gases will stop their vertical movement and redirect themselves across the ceiling. The ceiling directly above the area of fire origin should show signs of heavy fire damage.

Generally, when a fire travels through a room and exits, it will leave a distinct “V” pattern that is observable from the outside of the structure. This pattern may involve a few feet of the structure, or it may involve two or more floors or even a few rooms. Regardless, the pattern will look like a “V” against the remaining portion of the structure.

Narrow “V” patterns or those resembling an “A” usually are caused by an extreme heat source. This source may have been a flammable or combustible liquid. The burn pattern on the floor also would reveal considerable damage, as would the
ceiling above. The burning in this small area would have generated a significant amount of heat, and effects on the structure would indicate that.

This is very often the place where the fire goes straight through the roof. This pattern may also be recognizable from the outside. If this area is identified as the area of fire origin, one needs to evaluate the cause of the significant fire damage carefully. A piece of furniture, such as a large foam-padded sofa, could have produced a very significant fire load. Alternatively, a liquid could have been poured in the area. The difficult challenge arises if the liquid was poured on the sofa. This would require a close evaluation of the remains of the sofa to determine if it suffered damage beyond what would be considered normal for such a fire.

Security before the Fire

The security of the structure before the fire is also an important consideration for the fire officer. As such, interviewing the firefighters at the scene will be an important part of fire origin and cause determination.

The officer may need to question other firefighters concerning what they found on arrival. Here is a list of some information that can be helpful in making an origin and cause determination. Some were mentioned earlier.

- What were the extent and color of the fire and smoke?
- Who was present? What were they doing?
- Were there people there who have been observed at other fires?
- Were any persons acting suspiciously?
- How did the owners and occupants act?
- How were the owners and occupants dressed?
• Had any possessions, appliances, or other items been removed?

• Did anyone see vehicles leaving the area?

• Which parts of the structure were burning?

This list is not exhaustive; it is meant to suggest typical questions one needs to ask.

**Entry Considerations**

The officer also needs to ask a series of questions concerning entry into the structure. Like the above list, it is not complete and is meant merely to get one started.

• Were the windows and doors locked?

• Did the firefighters use any method of forcible entry?

• Where were they used, and which type was used?

• Were there signs of forcible entry before fire department arrival?

• Were the contents as they should have been, or had they been rearranged to burn?

• Were personal items present, or had they been removed?

• Was the structure livable, similar to others in the neighborhood?

• Was there evidence of burglary?

• Was there food in the refrigerator or cupboards?

• Were the utilities on?
• Were there any cooking or eating implements present?

**Observations**

Determine another set of facts from the firefighters who were first on the scene. These facts relate to the fire itself and possible incendiaryism, for example:

• Rapid burning,
• Fire flashbacks,
• Burning on the surface of water,
• Extreme heat, or fires hard to extinguish,
• Low-burning fires,
• Multiple fires or fires in unusual places,
• Holes in the walls, floors, and ceilings,
• Trailers and accelerant containers,
• Missing equipment,
• Remains of incendiary devices,
• Obstructed view through the windows,
• Unnatural odors, and
• Oily substances.

By now, the officer is probably ready to begin a systematic inspection of the interior of the structure.
Activity 8.1:
Exterior Fire Scene Examination
Student Activity Worksheet

Time: 45 minutes

Purpose:
To reinforce the need to conduct an outside evaluation of the fire scene before starting an inside evaluation.

Directions:
1. Your instructor will divide the class into small groups and ask each group to appoint a spokesperson.
2. Read and view the slides for the scenarios.
3. You will have 20 minutes to discuss the scenarios and answer the activity questions.
4. When the instructor calls on your group, report your answers to the class.
Scenario

Your department has just extinguished a fire in a one-story, wood-frame (platform type), single-family dwelling. The fire had been reported at 1745 hours. The temperature is 75°F; the sky is clear; and there is no measurable wind.

The dwelling has a full basement used as a vehicle garage and general storage area. This area sustained no fire damage. The contractor built a fire separation wall in the attic area that divides the kitchen, dining room, and living room areas, and to the bedroom and bathroom areas. The fire separation wall extended from the exterior bearing walls to the roof but did not extend out over the exterior overhang (soffits).

During your suppression efforts, you observed that the fire separation wall was undamaged and that the ceiling in the bedroom section of the structure was also intact. Firefighters had to pull the ceilings down in the bedrooms to extinguish the fire in the ceiling area.
1. At which end of the building did the fire appear to originate?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

2. What observations support your answer to question 1?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

3. How did the fire get past the fire separation wall in the attic area and into the bedroom area?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

4. What observations support your answer to question 3?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
Scenario 2

Your department is attempting to extinguish a fire in a two-story, wood-frame (balloon type), single-family dwelling unit. The fire was reported at 1015 hours. The dwelling has been renovated several times since its original construction in 1922.

The temperature is -5°F, it is overcast, but there is no measurable wind. The temperature has been near 0°F for the past three days, and heating systems have been operating near capacity. Many homes have fireplaces that are used to supplement the normal heating system. Because of the remote location of this structure, the fire burned for a considerable time before you were notified.

Upon your arrival, you observe that the center portion of the structure is heavily damaged, while the ends are less damaged. Because of the damage to the structural elements, you deploy a defensive operation.

Soon after your arrival, the homeowner arrives and informs you that he was the last person in the home and left at about 0700 hours to go to work.

During your suppression efforts, you observe that there is no apparent fire in the basement, the electrical service enters the structure on the side that is just becoming involved, and there is a large supply of well-seasoned firewood at the rear of the dwelling.
1. Is there any visible “V” pattern? If so, where does it appear to be located?

   

2. Does the wall near the chimney appear to be more heavily damaged than the wall on the opposite side of the structure?

   

3. What observations support your answer to Question 2?

   

4. What questions would you have to ask the property owner regarding fire cause determination?

   
Examination of Interior Structural Components

The interior of a structure is the best place to find the best clues to determine the area or point of fire origin. As such, the officer needs to remember the observations made while examining the outside of a structure. The interior inspection should result in a similar conclusion relative to the area of greatest fire damage and fire origin location. If not, it is time to pause and revisit the previous set of indicators.

The examination goes from the least- to most-damaged area, from:

- Lightly to heavily smoke-stained areas;
- Lightly to heavily damaged areas; or
- Lightly to heavily charred areas.

Area of Least Fire Damage

A systematic interior inspection begins with the area of least fire damage. This area will often have the greatest amount of smoke damage since there was limited open flame or actual combustion in the area. Open flames have a tendency to push the smoke from the area. The heat is said to wash the area. It is common to find little smoke or carbon deposits on window glass at or near the point of fire origin. However, a tremendous amount of smoke and carbon deposits on glass remote from the area of fire origin is common. This area often will have the greatest amount of smoke damage since there was limited open flame or actual combustion in the area.

One must survey the structural elements to determine the path of fire travel and the area of greatest damage. For example, as fire travels from room to room or up an open stairwell, damage is usually greater on the side from which the fire came. The area directly above a door on the side that is opposite the path of fire travel will have less fire and smoke damage than on the side from which the fire came. Wall studs
that become exposed generally will be burned more heavily on the side of the fire travel.

As the officer surveys fire damage, it is important that he or she note of any areas that were damaged before the fire that would allow the fire to spread. Many times, they will be obvious: for example, holes in walls for which there is no apparent explanation of how they got there or why they are there. Persons experienced in starting fires may very well cause this type of damage before the fire, hoping that the fire will more quickly extend from the room of origin.

Typically, the floor is in a protected area and, generally, the damage to the floor should be 20 to 30 percent of the damage to the ceiling directly above. Holes in the floor must always be examined because fire does not typically burn downward. The hole should be evaluated to determine whether the fire came from the floor below or if it burned downward. If it burned downward, it may have resulted from a flammable or combustible liquid accelerant. This could have produced a considerable amount of heat in a concentrated location.

The burning will usually go down into the floor supports (joists) and create a “V” pattern. The burned flooring will usually have a very distinct starting and stopping point. It is very common to have a hole burned through wooden floor material and have clear unburned flooring only inches away. It is also very common for nylon carpeting to be singed or melted from the radiant heat in the situation just described. The carpet will be hard to the touch, and the strands in the pile will have melted together.

**Nonstructural Building Components**

The officer also needs to examine the nonstructural building components. This category includes items such as doors, shelves, counters, cabinets, light fixtures and bulbs, and window glass.
The edges of doors will provide valuable clues to fire travel. If the door was closed, the edges will be less burned or totally clear of burning, as long as the door remained closed during the entire fire. If the door was closed, the burning should be uniform across the door. However, the door will be more heavily burned at the top than at the bottom. If the door was open, the sides of the door will be burned. The edges of the door that had the greatest exposure to the path of fire travel will have the greatest char.

Shelving should be examined to determine the lowest level of burning. There may be several shelves, so it is necessary to look at their tops as well as their bottoms. If the bottom of the top shelf is heavily burned, the fire was lower. Continue the examination until you determine the burning was on the top of the shelf only and not on the bottom. This will provide a clue to the lowest level of burning. Items such as shelves and open doors can also deflect the path of fire travel. Often, this is evident when fire patterns indicate that an area was protected and has little fire damage.

Incandescent light bulbs are often good indicators of the path of fire travel. As the fire generates heat, the side of the bulb that is toward the heat starts to soften. The glass is very lightweight and has a tendency to soften easily. This usually occurs when the bulb is subjected to a temperature of 900°F for 10 minutes. While the glass is softening, heat-caused pressure starts to rise in the bulb. It tends to push the soft glass toward the path of fire travel. In some instances, the bulb will break as it cools. If the break is small, the remainder of the globe will remain intact and continue to point. In most instances, the part that breaks is the side that is distended toward the fire. The bulb often will have more carbon and soot on the side away from the fire than it does on the side toward the fire.

If the bulb is not heavily damaged, it may be possible to determine if the bulb was energized at the time of the fire. If the globe is broken and the filament is not broken, this is a good indication that the bulb was not energized at the time of
the fire, or at least when the glass globe broke. Think of the last time you broke a light bulb. As soon as the globe broke what happened to the filament? It got very bright for an instant and then it went out. Since the filament inside the bulb is burning in an inert gas environment, the filament overheats as soon as it burns outside of its protective environment. If the bulb filament is blackened, the bulb was energized. If the filament is silver in color, the bulb was not energized.

**Windows and Glass**

Window or other glass, such as that in picture frames, can also provide clues about the path of fire travel. As one works from the least burned area to the heavier burned area, the clues should point continually toward the most likely area or point of fire origin. Window glass that is heavily covered with black carbon was most likely not near the area of fire origin. The glass that is clear and free of carbon and soot was nearer a great deal of heat in a free-burning fire; it may have been very near the area of fire origin.

The difficulty comes when one finds a great deal of the window glass clean. This indicates that the fire was fast, intense, and had a plentiful amount of air to burn freely. It is at this point that one starts to analyze the cracking, or crazing of the glass. The term “crazing” refers to half-moon-shaped cracks that appear in the glass. This will occur before the glass breaks and before air passes over it as the fire is vented. As air passes over the glass, it will tend to cool the glass and stop the crazing process.

In areas remote from the fire origin but still exposed to high heat, glass will tend to have large half-moon cracking (crazing).

The same applies to the glass in picture frames. Smoke stains that will not rub off and appear to be baked on were usually closer to the point of origin than those stains that smudge and come off when wiped.
Lowest Level of Burning

Determining the lowest level of burning is always critical to determining the area or point of fire origin. The evaluation of structural and nonstructural building components will provide valuable clues to the direction of fire travel, areas of greatest heat build-up, and the area most likely to be a point or area of origin.

When more than one of these areas of origin are found, they must be examined to determine if there were two or more separate fires. One needs to find out if a fire trailer was used to ignite several areas at about the same time or if the second area of origin was a secondary fire caused by the original fire. These often can be explained by the combustible material in the area. For example, in a barbershop it appeared that the fire originated on the seat of each of five barber chairs. However, further and closer examination revealed that the area of fire origin was closer to the floor and the five separate fires were started from burning ceiling tile that dropped into the chairs.

Examination of Building Contents

The contents of the structure also need to be examined to help determine the area of fire origin. Just as the structural components provided clues on the path of fire travel, furniture can do the same. Furniture should be examined to determine which side has the greatest damage. Knowing this will provide a clue to the path of fire travel. The side of greatest damage will face the path of fire travel.

The material of the furniture also needs to be evaluated including any metal springs found in mattresses, chairs, or sofas. If the metal springs have any resiliency left, they spring back when pulled. This would indicate that they have had light or moderate heat exposure. If they are flat and have no spring left, they have been exposed to an excessive amount of heat. This may also indicate that they underwent a lengthy period of burning.
Consider the following example. Two-thirds of the springs still have some resiliency left, but the remaining one-third has no action left in the springs. This would indicate that the 33 percent with the greatest damage sustained the highest amount of heat or the longest period of burning. Other clues must also be used to determine the area or point of origin. These clues include damage on the floor below and damage above, the “V” pattern, and ceiling damage. Collectively, these clues will help determine if a particular area could be the area or point of origin. Something unusual happened to one-third of the bed, and the other clues will help to determine what it was.

One’s first impression is often the best clue. If one walks into a bedroom and finds the remains of a pile of clothing burned on a bed, the bed more severely damaged than the area around it, and the closet empty of clothes and hangers, one has three very important clues as to the area of fire origin. The remaining step is to determine what or who caused it.

Furniture is often removed or exchanged before the fire. Regardless of the amount of fire damage, there will always be some remains of furniture. It may be some metal brackets, springs from the chair, the twisted metal frame of a bicycle, or other metal item. If there is no evidence of furniture, there is a strong possibility that there was none there before the fire.

Another common practice is to switch good furniture for poorer quality goods. The quality goods are removed and inferior items brought in. This observation will almost always correspond with other clues to an incendiary fire. One should always share this with the fire investigator. The investigator will try to locate the good furniture. Often it is stored in a rental storage space, a rented moving truck, or in a friend’s garage. A few telephone calls can often locate the goods.

Always examine electrical and heating appliances to determine any involvement in the fire. Often, fires in appliances will destroy the device. Examining the damage
Operations

may indicate that there was more heat damage inside the appliance than outside it. Examine items such as televisions to determine if the damage is greater inside or outside the cabinet. Heat-producing appliances, such as furnaces, heaters, portable heaters, kitchen stoves, and similar devices, must always be evaluated for their involvement in the fire. Were they a victim of the fire or the cause of the fire? The kitchen stove is often involved in kitchen fires. It is usually a victim of the fire, as the material on top of the stove is what started the fire. The stove was simply the heat source that caused the problem.

Controls need to be examined to determine if they were in the on or off position at the time of the fire. Even in an obvious fire on the top of the stove that involves the cabinets above and leaves the distinct “V” pattern, the officer must look at the controls to determine if the stove was on. If the stove was not on at the time of the fire, it may change the results of the analysis totally.

Reading Fire Patterns

Fire leaves a characteristic pattern as it burns. We mentioned the “V” pattern earlier and need to say more about it now.

The plume of hot gases rising over something that is burning often looks like a cone, with its lower point aiming at the source of the heat. When undisturbed, the angle between the plume boundaries and the vertical axis is about 15 degrees. Nearest the heat source, the sides spread into a cone, which traces the boundary of the flame zone.

As gases ascend in the plume, air entertainment cools them. As the temperatures in the plume reach that of the surrounding air, the plume’s upper boundaries extend outward. A physical barrier, like a ceiling, will promote the lateral spread of the plume boundary.

When a vertical surface such as a wall stops a plume’s progress, damage patterns in the shape of a “V” or “U” often
occur on the surface. In that portion of the plume containing the hot gases, the “V” will be erect. In the flame zone of the plume, the “V” will be inverted. Together, the two parts of the plume look like an hourglass.

The size of the base of the fire affects the width of the plume, which will increase as the fire spreads. A small surface-area fire will generate a narrow pattern; a large surface-area fire will generate a wide pattern. The angle of the sides of the “V” remain at about 10 to 15 degrees regardless of the heat release.

However, airflows in the vicinity can destabilize a plume with larger angles resulting. Normally, the angle is approximately 15 degrees if the plume is undisturbed. Fire plumes next to combustible materials often create larger angles.

The fire often spreads laterally on combustible surfaces so that the burn pattern expands beyond a point that would have been reached on a noncombustible surface. The flame spread properties of the surface, its orientation to other burning materials, and the temperature of any hot gases impinging on it will dictate the extent of the spread. In cases like this, the pattern may exceed the anticipated 12 to 15 degrees found in other plumes.

Burning patterns or linear demarcations that appear to be flat are usually the result of heat being pushed down from the ceiling. If the wall covering is combustible, such as wood paneling, the pattern may be consistent around the room except for the area of fire origin. This is usually seen when the top one-third of the paneling is burned, blistered, or charred from a high level of heat. The tops of the furniture will often be burned in a similar way. The tops of the sofa, chairs, end tables, and other items in the area being burned or charred on the top with the remainders not badly damaged indicates that the heat came from above. This will usually occur in accidental fires. On the other hand, incendiary fires are usually accelerated, cause ceiling damage early, and cause the fire to ventilate vertically.
Activity 8.2:
Reading Fire Patterns
Student Activity Worksheet

Time: 45 minutes

Purpose:
To reinforce the ability to read fire patterns that will help determine the area of fire origin.

Directions:
1. Your instructor will divide the class into small groups and ask each group to select a spokesperson.
2. If time permits, you may be asked to complete both scenarios.
3. Read the assigned scenario.
4. You have 15 minutes to answer the questions regarding your assigned scenario.
5. Be prepared to report to the class.
Scenario 1

Your department has just extinguished a fire in the workshop area of a one-stall garage located at the rear of a single-family residence. The garage is 24’ by 14’ and has block walls and a wooden roof. The ceiling is ½” drywall material over wooden structural members.

The garage has one electric light fixture in the center and one clamp-on fixture on a workbench adjacent to the area of fire origin.

The owner informed you that about 30 minutes before the fire he had plugged in an electric heater used to strip paint. He had placed it on the edge of the garbage can to heat up while he went to the basement to get the chair he was going to strip. Beside the garbage can was a plastic bag filled with clean rags.

From the basement, his wife saw smoke and called the fire department.

You are the officer dispatched to this location for a smoke investigation. Upon arrival, you found the small fire and quickly extinguished it.

Now you are trying to read the fire patterns to determine the area of fire origin and a possible cause. You will determine whether the fire is accidental or whether you should call a fire investigator.

1. Is there a distinctive fire pattern? If yes, describe it.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
2. Do you have an opinion on where the fire started? If yes, support your opinion with observations.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

3. Do you need to call a fire investigator to conduct an investigation?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Notes:
Scenario 2

Your department received a call for a smoke investigation. Upon arrival at the one-story, wood-frame (platform-type), single-family dwelling, you found the doors locked and no one at home; you had to force entry into the dwelling. You also noticed a “For Sale” sign in the front yard, apparently there for some time.

There was a fire in a reclining chair in the living room. Fire also had reached the wall covering and the ceiling area directly above the chair. Your crew quickly extinguished the fire. One corner of the living room was damaged, and there was some light smoke damage throughout the house.

Soon after extinguishment, the owner arrived and appeared to have been drinking. He was belligerent and kept asking if you knew what caused the fire. He said you should have let the place burn down. Soon, however, the owner collected himself and settled down. He returned to the living room and started talking about all the trouble he had been having with the television and that certainly it must have been the cause of the fire.

As you examine the walls, the chair, and the ceiling area, he continually tries to draw your attention to the television set that is out of its case and plugged in. He tells you that he had only been gone to the store about 20 minutes to buy beer. He states that he does not smoke and no one else has been in the house for two days.

Can you determine the area of origin and the fire cause? Do you need to call in an investigator?

1. Is there a distinctive fire pattern? If yes, describe it.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
2. Does the television appear to be the cause of the fire as indicated by the owner?

3. Does the ceiling damage over the chair appear to be consistent with the fire in the chair?

4. Do you feel it necessary to call in a fire investigator?
Notes:
Module Summary

The fire officer has simple but important responsibilities after suppression efforts end and before a fire origin and cause determination can start.

As a fire starts and progresses through a structure, it will leave many clues for the careful observer. Reading the clues will help one arrive at the point of origin of the fire. Arriving at the point of origin, in turn, will help one to search for the cause of the fire.

To go into a structure fire and start looking blindly for clues will often lead to incorrect conclusions. The officer needs to use a systematic process at every fire. The results should assist in finding the area where the fire started. When the officer finds this point and can determine an accidental cause, his or her inspection task may be completed. If the officer can find the area of fire origin but cannot determine the cause, he or she should have the good sense to request a fire investigator.

Some jurisdictions have the resources whereby a trained fire investigator will respond to every fire. Other jurisdictions will receive assistance only after a preliminary evaluation determines that the fire was not accidental. Regardless, the fire officer plays a very important early role in determining the origin and cause of the fire.

Fire officers and firefighters owe it to the investigator to give him or her all the help possible in the form of observations, evidence, opinions, and reports. Everyone involved needs to remember that the investigation is a team effort and that if the real cause can be determined, it is a win-win situation for all.
MODULE 8

APPENDIX

FIRE SCENE EXAMINATION

CHECKLIST
Fire Scene Examination Checklist

This checklist is provided to help the company officer and crew conduct a systematic examination of the fire scene to help determine the area of fire origin and the possible cause.

1. Should overhaul be delayed to allow fire cause determination?

   [ ] yes  [ ] no

2. Exterior Examination Observations
   a. Classification of building construction______________________________
   b. Estimated age of construction______________________________
   c. Area(s) of greatest damage______________________________
   d. Area(s) where fire exited building______________________________
   e. Are there obvious “V” patterns? [ ] yes [ ] no
   f. Was building secure prior to the fire? [ ] yes [ ] no
   g. Are there any unusual signs or objects?______________________________
   h. Note anything unusual about the electrical system or equipment?

3. Interior Examination Observations
   a. What is the area of least damage?______________________________
   b. What is the area of most damage?______________________________
   c. Note damage to the following structural components.
      Door moldings______________________________
d. Note damage to the following nonstructural components:

Shelving

Incandescent light bulbs

Stained window glass

Broken window glass

Melted metal objects

Doors

4. Note the lowest level of burning.

5. What is the source of fire or secondary fire?

6. Examination of Building Contents

Unusual items

Furniture

Appliances

7. Reading Fire Patterns

a. Narrow “V” patterns

b. Wide or large “V” patterns
8. Reading Fire Travel

   a. Even levels of burning [ ] yes [ ] no

   b. Lack of deep char [ ] yes [ ] no

Notes: