Incident Safety Officer

ISO-Student Manual

3rd Edition, 3rd Printing-August 2013

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3rd Edition, 3rd Printing

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FEMA

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U.S. DEPARTMENT OF HOMELAND SECURITY

UNITED STATES FIRE ADMINISTRATION

NATIONAL FIRE ACADEMY

FOREWORD

The U.S. Fire Administration (USFA), an important component of the Department of Homeland Security (DHS), serves the leadership of this Nation as the DHS's fire protection and emergency response expert. The USFA is located at the National Emergency Training Center (NETC) in Emmitsburg, Maryland, and includes the National Fire Academy (NFA), National Fire Data Center (NFDC) and the National Fire Programs (NFP). The USFA also provides oversight and management of the Noble Training Center in Anniston, Alabama. The mission of the USFA is to save lives and reduce economic losses due to fire and related emergencies through training, research, data collection and analysis, public education, and coordination with other Federal agencies and fire protection and emergency service personnel.

The USFA's National Fire Academy offers a diverse course delivery system, combining resident courses, off-campus deliveries in cooperation with State training organizations, weekend instruction, and online courses. The USFA maintains a blended learning approach to its course selections and course development. Resident courses are delivered at both the Emmitsburg campus and the Noble facility. Off-campus courses are delivered in cooperation with State and local fire training organizations to ensure this Nation's firefighters are prepared for the hazards they face.

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FIREFIGHTER CODE OF ETHICS

Background

The Fire Service is a noble calling, one which is founded on mutual respect and trust between firefighters and the citizens they serve. To ensure the continuing integrity of the Fire Service, the highest standards of ethical conduct must be maintained at all times.

Developed in response to the publication of the Fire Service Reputation Management White Paper, the purpose of this National Firefighter Code of Ethics is to establish criteria that encourages fire service personnel to promote a culture of ethical integrity and high standards of professionalism in our field. The broad scope of this recommended Code of Ethics is intended to mitigate and negate situations that may result in embarrassment and waning of public support for what has historically been a highly respected profession.

Ethics comes from the Greek word ethos, meaning character. Character is not necessarily defined by how a person behaves when conditions are optimal and life is good. It is easy to take the high road when the path is paved and obstacles are few or non-existent. Character is also defined by decisions made under pressure, when no one is looking, when the road contains land mines, and the way is obscured. As members of the Fire Service, we share a responsibility to project an ethical character of professionalism, integrity, compassion, loyalty and honesty in all that we do, all of the time.

We need to accept this ethics challenge and be truly willing to maintain a culture that is consistent with the expectations outlined in this document. By doing so, we can create a legacy that validates and sustains the distinguished Fire Service institution, and at the same time ensure that we leave the Fire Service in better condition than when we arrived.

FIREFIGHTER CODE OF ETHICS

I understand that I have the responsibility to conduct myself in a manner that reflects proper ethical behavior and integrity. In so doing, I will help foster a continuing positive public perception of the fire service. Therefore, I pledge the following…

- Always conduct myself, on and off duty, in a manner that reflects positively on myself, my department and the fire service in general.
- Accept responsibility for my actions and for the consequences of my actions.
- Support the concept of fairness and the value of diverse thoughts and opinions.
- Avoid situations that would adversely affect the credibility or public perception of the fire service profession.
- Be truthful and honest at all times and report instances of cheating or other dishonest acts that compromise the integrity of the fire service.
- Conduct my personal affairs in a manner that does not improperly influence the performance of my duties, or bring discredit to my organization.
- Be respectful and conscious of each member's safety and welfare.
- Recognize that I serve in a position of public trust that requires stewardship in the honest and efficient use of publicly owned resources, including uniforms, facilities, vehicles and equipment and that these are protected from misuse and theft.
- Exercise professionalism, competence, respect and loyalty in the performance of my duties and use information, confidential or otherwise, gained by virtue of my position, only to benefit those I am entrusted to serve.
- Avoid financial investments, outside employment, outside business interests or activities that conflict with or are enhanced by my official position or have the potential to create the perception of impropriety.
- Never propose or accept personal rewards, special privileges, benefits, advancement, honors or gifts that may create a conflict of interest, or the appearance thereof.
- Never engage in activities involving alcohol or other substance use or abuse that can impair my mental state or the performance of my duties and compromise safety.
- Never discriminate on the basis of race, religion, color, creed, age, marital status, national origin, ancestry, gender, sexual preference, medical condition or handicap.
- Never harass, intimidate or threaten fellow members of the service or the public and stop or report the actions of other firefighters who engage in such behaviors.
- Responsibly use social networking, electronic communications, or other media technology opportunities in a manner that does not discredit, dishonor or embarrass my organization, the fire service and the public. I also understand that failure to resolve or report inappropriate use of this media equates to condoning this behavior.

Developed by the National Society of Executive Fire Officers

A Student Guide to End-of-course Evaluations

Say What You Mean ...

Ten Things You Can Do to Improve the National Fire Academy

The National Fire Academy takes its course evaluations very seriously. Your comments and suggestions enable us to improve your learning experience.

Unfortunately, we often get end-of-course comments like these that are vague and, therefore, not actionable. We know you are trying to keep your answers short, but the more specific you can be, the better we can respond.

Actual quotes from student evaluations:	Examples of specific, actionable comments that would help us improve the course:
1 "Update the materials."	• The (ABC) fire video is out-of-date because of the dangerous tactics it demonstrates. The available (XYZ) video shows current practices. • The student manual references building codes that are 12 years old.
2 "We want an advanced class in (fill in the blank)."	• We would like a class that enables us to calculate energy transfer rates resulting from exposure fires. • We would like a class that provides one-on-one workplace harassment counseling practice exercises.
3 "More activities."	• An activity where students can physically measure the area of sprinkler coverage would improve understanding of the concept. • Not all students were able to fill all ICS positions in the exercises. Add more exercises so all students can participate.
4 "A longer course."	• The class should be increased by one hour per day to enable all students to participate in exercises. • The class should be increased by two days so that all group presentations can be peer evaluated and have written abstracts.
5 "Readable plans."	• The plans should be enlarged to 11 by 17 and provided with an accurate scale. • My plan set was blurry, which caused the dotted lines to be interpreted as solid lines.
6 "Better student guide organization," "manual did not coincide with slides."	• The slide sequence in Unit 4 did not align with the content in the student manual from slides 4-16 through 4-21. • The instructor added slides in Unit 4 that were not in my student manual.
7 "Dry in spots."	• The instructor/activity should have used student group activities rather than lecture to explain Maslow's Hierarchy. • Create a pre-course reading on symbiotic personal relationships rather than trying to lecture on them in class.
8 "More visual aids."	• The text description of V-patterns did not provide three-dimensional views. More photographs or drawings would help me imagine the pattern. • There was a video clip on NBC News (date) that summarized the topic very well.
9 "Re-evaluate pre-course assignments."	• The pre-course assignments were not discussed or referenced in class. Either connect them to the course content or delete them. • The pre-course assignments on ICS could be reduced to a one-page job aid rather than a 25-page reading.
10 "A better understanding of NIMS."	• The instructor did not explain the connection between NIMS and ICS. • The student manual needs an illustrated guide to NIMS.

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UNIT 1: INTRODUCTION

COURSE GOAL

To provide students with the knowledge and skills needed to perform the duties of the Incident Safety Officer (ISO) during incident operations and training evolutions.

OBJECTIVES

The students will:

1. *Describe the key elements of the Incident Command System (ICS) that affect the duties and responsibilities of the Safety Officer for an incident or event.*

2. *Describe the basic duties of the ISO.*

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INTRODUCTION

Goal

The goal of this course is to provide students with the knowledge and skills needed to perform the duties of the Incident Safety Officer (ISO) during incident operations and training evolutions.

Scope

This course is an incident-specific, scenario-oriented course designed to teach students what an ISO needs to know at an incident. The course uses instructor-led discussion, multimedia activities, and small group discussions to convey instructional points.

Audience

This course is designed for fire and emergency medical services (EMS) responders who may be designated by the Incident Commander (IC) as an ISO while working within an Incident Command System (ICS). These assignments may occur during firefighting, EMS, special operations incidents, and training evolutions.

INCIDENT SAFETY OFFICER RELATED TO THE FIRE DEPARTMENT SAFETY OFFICER

The ISO is designated at the time of an incident. This designation will follow the emergency management plans and policies of the jurisdiction and department. The ISO is typically assigned by an IC when an incident requires one. The IC must delegate this role in order for it to be done well.

Fire departments recognize that the ISO is closely linked to the Safety Officer position advocated by the National Fire Protection Association (NFPA) for use by all departments (NFPA 1521®, *Standard for Fire Department Safety Officer*, adopted first in 1977). Over the past 30 years, the fire service has seen the origin and development of the fire department Safety Officer's position. The Safety Officer position is the manager or administrator of the fire department's Occupational Safety and Health Program.

Under NFPA 1521® the Safety Officer in a fire department:

- helps to establish safety standards for a department;
- leads in the development of the risk management efforts and plans; and
- establishes health and fitness, occupational safety, and related programs.

The Safety Officer's position can also encompass the Health and Safety Officer's (HSO's) role within a department. The role of the HSO is covered in another course.

Because the organization's Safety Officer is the lead manager or officer involved in these matters, they often become tapped to be the ISO for an incident or event. This is very likely to be the case for any large-scale emergency. Department Safety Officers become ISOs when called upon.

The National Incident Management System (NIMS) (December 2008), established and described by the Federal government, and adopted by most States, calls for an ISO (also referred to as the Safety Officer within the Incident Command structure) to be one of the first Command Staff positions established at any emergency incident where it is needed. All students should recognize that they may be called on to be the Safety Officer at some incident, even one where their department responds with only a minimal role.

NFPA's standard defines the ISO as follows:

> An individual appointed to respond to or assigned at an incident scene by the Incident Commander (IC) to perform the duties and responsibilities specified in NFPA 1521®.

In this course, sponsored by the Federal Emergency Management Agency (FEMA), the role of the ISO will be presented with a focus on the following ICS definition from NIMS (December 2008):

> The Incident Safety Officer monitors incident operations and advises the Incident Commander or Unified Command (IC/UC) on all matters relating to operational safety, including the health and safety of emergency responder personnel. The ultimate responsibility for the safe conduct of incident management operations rests with the IC/UC and supervisors at all levels of incident management. The Safety Officer is, in turn, responsible to the IC/UC for the systems and procedures necessary to ensure ongoing assessment of hazardous environments, including the incident safety plan, coordination of multiagency safety efforts, and implementation of measures to promote emergency responder safety as well as the general safety of incident operations.

The ISO should have knowledge of a range of topics such as risk management, hazardous materials (hazmat), terrorism, infection control procedures, and even building construction and fire suppression. The ISOs will also be expected to know about their department's incident management system and the ICS.

RESPONSIBILITIES AT THE SCENE

As defined in the December 2008 version of NIMS/ICS, the Safety Officer is part of the Command Staff and is responsible for safety at the incident scene including the following:

- identifying and mitigating hazardous situations;
- ensuring safety messages and briefings are made;

- exercising emergency authority to stop and prevent unsafe acts;
- reviewing the Incident Action Plan (IAP) for safety implications;
- assigning qualified deputies or assistants when needed;
- initiating preliminary investigation of accidents within the incident area;
- reviewing and approving the Responder Medical Plan; and
- participating in planning meetings.

The ICS offers checklist-type forms to assist personnel with the assessment and mitigation planning task. These forms include ICS Form 215A, *Incident Action Plan Safety Analysis*, and ICS Form 202, *Incident Objectives*, where a safety message is included. The ISO can use these forms to help communicate to the IC or the Operations Section Chiefs, as the case may be, about the health and safety issues they have identified. The forms are also useful for communicating mitigation strategies, tactics, tasks, control measures, and the support needs that can address them.

COURSE OVERVIEW

This course is primarily intended to prepare students to perform as ISOs. The seven units provide a background understanding of this role and why it is important. The units also cover how the incident-specific efforts are related to preparedness and the safety standards that apply. The course also provides the student with the opportunity to practice or apply these lessons. Each of the seven units are described briefly here.

Unit 1: Introduction

This unit identifies the key elements of the ICS that affect the duties and responsibilities of the ISO and provides the overall objectives and plan for the course.

Unit 2: Fatality and Injury Data

This unit identifies the most common types of firefighter fatality and injury data and the common denominators. Incident safety is the number one priority.

Unit 3: Principles of Risk Management

This brief unit explains a Risk Management Model and how it can have a positive influence on department operations. An ISO should know about the Risk Management Plans and safety standards that apply to any incident and become better prepared to translate these into safety measures or actions at an incident.

Unit 4: Safety Responsibilities

This unit draws on the ICS and the standards of the NFPA to provide detailed information about the responsibilities of the ISO and how this person can be successful in this critical role.

Unit 5: Safety at Selected Incident Types

This unit focuses specific attention on a number of known incident types for which safety matters are critical. The unit will help the students to improve their knowledge about the safety issues relating to wildland firefighting, highway/traffic safety, terrorism, weather-related incidents, and firegrounds.

Students will also gain a better understanding of the importance of proper medical treatment and followup care for a health exposure and the importance of incident-scene rehabilitation.

Unit 6: Operational Risk Management

This unit provides specific lessons to help a student become better prepared to identify and assess safety risks, and then to form safety measures and plans to address them. Risk management affects emergency incident operations.

Unit 7: Closing and Course Summary

This brief unit reviews the key points related to the roles and responsibilities of the ISO. The unit incorporates a course evaluation and an examination.

SUMMARY

The individual assigned as the ISO must have the knowledge, skills, and abilities (KSAs) needed to perform effectively at an incident. Note that NIMS (December 2008) establishes a credentialing process and that FEMA is expected to publish qualification criteria recommended for use under NIMS. This course assumes that all fire departments, EMS, and other responder organizations are weaving safety into the current fabric of their organizations.

Once an organization has a Risk Management Plan that is coordinated with the preparedness plans of its jurisdiction or region, and the organization has adopted safety standards, then ISOs will be better prepared to perform their responsibilities in response to the safety cues that can be seen or found at any incident.

The use of safety cues is something relied on throughout the instruction of this course. Safety cues are conditions or indications that the ISO needs to be aware of at an incident scene.

These conditions or indications could be unsafe acts by personnel, or unsafe operational tactics or conditions affecting the public or responders. The experienced ISO, when operating at an incident scene, will focus on these safety cues.

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NOTE-TAKING GUIDE

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INCIDENT SAFETY OFFICER

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UNIT 1:
INTRODUCTION

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COURSE GOAL

To provide students with the knowledge and skills needed to perform the duties of the Incident Safety Officer (ISO) during incident operations and training evolutions.

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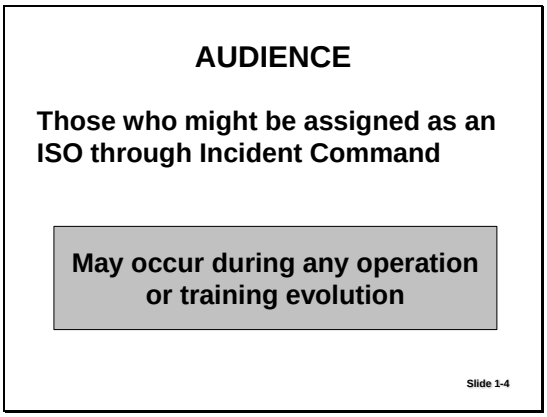

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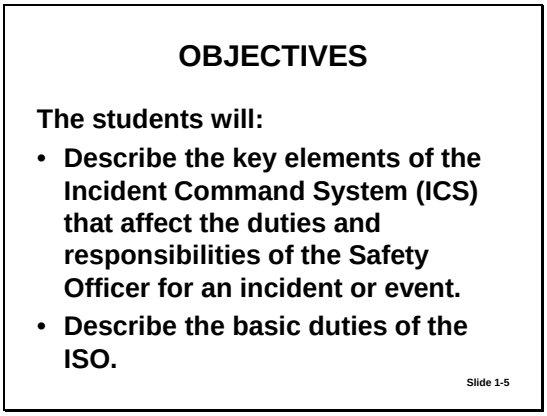

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INDIVIDUAL STUDENT INTRODUCTIONS

- **Complete Student Information Sheet**
- **Give name, department, and position**
- **State what you hope to take away from this course**
- **Identify an incident safety situation of interest to you**

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VIDEO:

"The Phoenix Fire Department Recovery Process"

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INCIDENT SAFETY OFFICER

- **An ISO is designated at the time of an incident by the Incident Commander (IC).**
- **A Safety Officer, if designated, is part of Command Staff.**
- **The ISO is closely linked to the Health and Safety Officer (HSO) position in fire or emergency medical services (EMS) department.**

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FIRE DEPARTMENT'S SAFETY OFFICER PER NATIONAL FIRE PROTECTION ASSOCIATION

- **Ally and support for the ISO**
- **Helps establish safety standards**
- **Leads in development of risk management efforts**
- **Establishes health and fitness, occupational safety, and related programs**

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INCIDENT COMMAND SYSTEM--AN INCIDENT'S SAFETY OFFICER

- **Monitors incident operations**
- **Advises the IC or Unified Command (UC) on all matters relating to operational safety**
- **Ongoing assessment of hazardous environments**
- **Coordination of multiagency safety efforts**

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INCIDENT COMMAND SYSTEM AND THE INCIDENT SAFETY OFFICER

- **Implementation of measures for general safety of incident operations**
- **Reviews responder-focused Medical Plans (done by others)**
- **Has emergency authority to stop and/or prevent unsafe acts during incident operations**

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ONSCENE RESPONSIBILITIES

- Identify and mitigate hazardous situations
- Ensure safety briefings are made--draw on ICS Form 215A, *Incident Action Plan Safety Analysis*
- Stop and prevent unsafe acts
- Review Incident Action Plan (IAP)

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ONSCENE RESPONSIBILITIES (cont'd)

- Assign assistants as needed
- Initiate investigations of accidents within incident area
- Review and approve the Responder Medical Plan
- Participate in planning meetings

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COURSE OVERVIEW

- Unit 1: Introduction
- Unit 2: Fatality and Injury Data
- Unit 3: Principles of Risk Management
- Unit 4: Safety Responsibilities
- Unit 5: Safety at Selected Incident Types
- Unit 6: Operational Risk Management
- Unit 7: Closing and Course Summary

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SUMMARY

- **The ISO must have the knowledge, skills, and abilities (KSAs) to perform effectively at an incident.**
- **The National Incident Management System (NIMS) will profile the qualifications needed in order to be credentialed.**
- **Once an organization has a Risk Management Plan, the ISO will be better prepared to perform his or her duties.**
- **The ISO can use "safety cues" to recognize unsafe conditions.**

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STUDENT INFORMATION SHEET

NAME: _____

DEPARTMENT: _____

CITY (OR COUNTY), STATE: _____

POPULATION SERVED BY DEPARTMENT: _____

AREA SERVED BY DEPARTMENT (SQUARE MILES): _____

Department Size

FULL-TIME/CAREER PERSONNEL: _____

PART-TIME/RESERVE PERSONNEL: _____

VOLUNTEER PERSONNEL: _____

NUMBER OF STATIONS: _____

Organization Delivery Profile

HAZARDOUS MATERIALS: YES NO

CONFINED SPACE/TECHNICAL RESCUE: YES NO

EMS

ALS FIRST RESPONSE: _____

BLS FIRST RESPONSE: _____

ALS TRANSPORT: _____

BLS TRANSPORT: _____

What I hope to take away from this course:

_____

_____

_____

_____

_____

Major safety risks known to exist within your community (name at least two):

Safety problem in the department and why:

UNIT 2:
FATALITY AND INJURY DATA

OBJECTIVES

The students will:

1. *Describe the impact of a responder fatality or serious injury.*
2. *Identify the most common causes of firefighter fatalities and injuries.*
3. *Identify common denominators at firefighter fatality incidents.*

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INTRODUCTION

There is a consensus among all disciplines and all governments that safety is the number one priority of incident management.

This is why the Safety Officer position is often one of the first Command Staff roles established for an incident. All Incident Commanders (ICs) are trained to know that safety is the first priority. They will recognize the need to have an Incident Safety Officer (ISO) take the lead on all safety matters so they can be assured that risk and mitigation strategies and safety tactics are properly considered as they develop, redevelop, and execute the needed Incident Action Plans (IAPs).

All students need to recognize that they may be called upon to be an ISO, even if their own department is not involved in any significant way with an incident. They may be called on to serve in this role because they have the knowledge, skills, and abilities (KSAs) to do the job. This course is intended to prepare you for this.

Incident safety is primarily focused on the public. Incident management wants to bring stability to an incident so fewer people are harmed or exposed to harm or risk. The ISO assists the IC or Unified Command to meet this important priority. The ISO then works to maintain and improve safety as the management of the incident continues even through the demobilization and recovery stages.

An ISO will also focus on the safety of responders. Firefighters and emergency medical services (EMS) personnel know that the strategies and tactics employed to protect the public and to stabilize and manage an incident will place responders at risk for serious injuries and the possibility of line-of-duty deaths (LODDs). The Incident Command System (ICS) and National Fire Protection Association (NFPA) identify a number of ISO responsibilities to protect the health and welfare of responders. The ISO has the responsibility, for example, to review the responder-focused Medical Plan (this is to be produced by the Logistics Section under the ICS, though the ISO may need to produce this responder-focused plan if a Logistics Section isn't needed).

The ISO has one of the most important sets of responsibilities within Incident Command. The ISO, and any of the Safety Officer's assistants, should be able to translate all the preparedness plans and safety standards that apply at an incident into actions and safety measures. The ISO's role is challenging and one of the most rewarding professional assignments you will ever have.

LINE-OF-DUTY DEATHS OR SERIOUS INJURY HAVE GREAT IMPACT

The death or serious injury of a responder in the line of duty is a tragedy that all want to avoid. Every response organization is supposed to have an incident management system that includes plans, exercises, programs, and standards related to health and safety. To meet NFPA standards, a fire department is to establish Risk Management Plans and safety standards. Fire departments are also to train their personnel to serve in Safety Officer-type roles, including as an ISO.

The ICS under the National Incident Management System (NIMS) anticipates that all response organizations are taking steps to meet the same type standards as fire departments. This includes being prepared to contribute to the safety objectives, strategies, and measures needed at any incident. Response organizations can be more successful each time they respond to an incident if the safety characteristics of the ICS are followed, and the health and safety systems work well.

There is much at stake. The impact of a fatality on the responder's immediate family cannot be overstated. The emotional stress of losing a loved one is recognized by everyone. What often is not known to those outside of the family is the financial hardship, the loneliness after the funeral and tributes are over, and spending a lifetime without the presence of a loved one.

The impact on the responder's extended family, his/her department, also is severe. Surviving personnel who were involved in the incident may second-guess their decisions and believe that the responder might still be alive if they had done something differently. The IC of the fatal incident may feel a sense of personal and professional loss. The stress on the organization can lead to a breakdown in communication between officers and other personnel, the unofficial assignment of blame, and stress in personal and professional relationships among department members.

A severe injury can have an impact on the responder's family and the department that is just as serious as the impact of a responder's death. The injury may require a long period of recovery. The injuries may be severe enough that the individual may never fully recover. The individual may be forced to retire from the fire or EMS service or from his or her nonfire service career (in the case of a volunteer). Many injuries, although not fatal to the responder, have a life-long impact on the quality of life of the individual and his or her family. They may affect the ability of the responder to support his or her family, and also the long-term life expectancy of the responder.

FIREFIGHTER FATALITIES

Congress created the National Fallen Firefighters Foundation (NFFF) to lead a nationwide effort to honor America's fallen firefighters. Since 1992, the nonprofit foundation has developed and expanded programs that fulfill that mandate.

Recognizing the need to do more to prevent LODDs and injuries, the foundation has launched a national initiative to bring prevention to the forefront. The Life Safety Initiative includes 16 critical points, with four of these directly applying to the ISO's efforts:

1. Enhance personal and organizational accountability for health and safety throughout the fire service.

2. Focus greater attention on the integration of risk management with incident management at all levels, including strategic, tactical, and planning responsibilities.

3. All firefighters must be empowered to stop unsafe practices.

4. Thoroughly investigate all firefighter fatalities, injuries, and near misses.

The **Everyone Goes Home** program was developed as a result of the work the foundation has done through the 16 critical points of the initiative. This program provides resource materials to the fire departments to promote safety, present training classes, and publicize the need for safety within the fire service. Information about the Life Safety Initiative and the materials used for the **Everyone Goes Home** program can be accessed through the NFFF's Web site (http://www.firehero.org).

We can apply the lessons of this initiative to all responders. Even though we do not yet have statistics covering all responders, we know that each year approximately 100 firefighters die in the line of duty. In 1977, the NFPA/U.S. Fire Administration (USFA) statistical series was formalized. Each year a report is prepared by the USFA on firefighter fatalities. These reports are available at (http://www.usfa.dhs.gov/fireservice/fatalities/statistics/).

Onduty firefighter deaths include any death that occurs when the firefighter is on duty. This includes firefighters who die at an emergency incident scene, during training, during fire department functions, and as the result of other accidents or illnesses that strike while the firefighter is on duty. Career firefighters are considered on duty during their scheduled work shifts. Volunteer firefighters are considered on duty while participating in any fire department nonemergency function, and from the time of alarm until the close of an emergency incident.

> Sudden cardiac death is consistently the number one cause of on-duty firefighter fatalities in the U.S. (NFPA, 2007)

Training-related events are now recognized as needing attention like any other incident. The NFPA reported that 10 percent of onduty firefighter deaths occurred during training-related activities (apparatus and equipment drills; physical fitness; live fire training; underwater/dive training; and during classes or seminars). The NFPA's standards now specifically reference training evolutions or exercises.

FIREFIGHTER INJURIES

The USFA reported that in 2006 more than 44,000 firefighters were injured on the fireground (*Firefighter Injuries in the United States*, NFPA, November 2007). Statistics from the NFPA's survey program on injuries are shown in Table 2-1 on the following page.

Table 2-1
Firefighter Injuries in the United States

Year	Total	Firefighting, Fireground	Responding, Returning	On Scene at Nonfire Calls	Training	Other On Duty
1981	103,340	67,510 (65.3%)	4,945 (4.8%)	9,600 (9.3%)	7,090 (6.9%)	14,195 (13.7%)
1982	98,150	61,370 (62.5%)	5,320 (5.4%)	9,385 (9.6%)	6,125 (6.2%)	15,950 (16.3%)
1983	103,150	61,740 (59.9%)	5,865 (5.7%)	11,105 (10.8%)	6,755 (6.5%)	17,685 (17.1%)
1984	102,300	62,700 (61.3%)	5,845 (5.7%)	10,630 (10.4%)	6,840 (6.7%)	16,285 (15.9%)
1985	100,900	61,255 (60.7%)	5,280 (5.2%)	12,500 (12.4%)	6,050 (6.0%)	15,815 (15.7%)
1986	96,450	55,990 (58.1%)	4,665 (4.8%)	12,545 (13.0%)	6,395 (6.6%)	16,855 (17.5%)
1987	102,600	57,755 (56.3%)	5,075 (4.9%)	13,940 (13.6%)	6,075 (5.9%)	19,755 (19.3%)
1988	102,900	61,790 (60.0%)	5,080 (4.9%)	12,325 (12.0%)	5,840 (5.7%)	17,865 (17.4%)
1989	100,700	58,250 (57.8%)	6,000 (6.0%)	12,580 (12.5%)	6,010 (6.0%)	17,860 (17.7%)
1990	100,300	57,100 (56.9%)	6,115 (6.1%)	14,200 (14.2%)	6,630 (6.6%)	16,255 (16.2%)
1991	103,300	55,830 (54.0%)	5,355 (5.2%)	15,065 (14.6%)	6,600 (6.4%)	20,450 (19.8%)
1992	97,700	52,290 (53.5%)	5,580 (5.7%)	14,645 (15.0%)	7,045 (7.2%)	18,140 (18.6%)
1993	101,500	52,885 (52.1%)	5,595 (5.5%)	16,675 (16.4%)	6,545 (6.5%)	19,800 (19.5%)
1994	95,400	52,875 (55.4%)	5,930 (6.2%)	11,810 (12.4%)	6,780 (7.1%)	18,005 (18.9%)
1995	94,500	50,640 (53.6%)	5,230 (5.5%)	13,500 (14.3%)	7,275 (7.7%)	17,855 (18.9%)
1996	87,150	45,725 (52.5%)	6,315 (7.2%)	12,630 (14.5%)	6,200 (7.1%)	16,280 (18.7%)
1997	85,400	40,920 (47.9%)	5,410 (6.3%)	14,880 (17.4%)	6,510 (7.6%)	17,680 (20.7%)
1998	87,500	43,080 (49.2%)	7,070 (8.1%)	13,960 (16.0%)	7,055 (8.1%)	16,335 (18.7%)
1999	88,500	45,550 (51.5%)	5,890 (6.7%)	13,565 (15.5%)	7,705 (8.7%)	15,790 (17.8%)
2000	84,550	43,065 (51.0%)	4,700 (5.6%)	13,660 (16.2%)	7,400 (8.8%)	15,725 (18.6%)
2001	82,250	41,395 (50.3%)	4,640 (5.6%)	14,140 (17.2%)	6,915 (8.4%)	15,160 (18.4%)
2002	80,800	37,860 (46.9%)	5,805 (7.2%)	15,095 (18.7%)	7,600 (9.4%)	14,440 (17.9%)
2003	78,750	38,045 (48.3%)	5,200 (6.6%)	13,855 (17.6%)	7,100 (9.0%)	14,550 (18.5%)
2004	75,840	36,880 (48.6%)	4,840 (6.4%)	13,150 (17.3%)	6,720 (8.9%)	14,250 (18.8%)
2005	80,100	41,950 (52.4%)	5,455 (6.8%)	12,250 (15.3%)	7,120 (8.9%)	13,325 (16.6%)
2006	83,400	44,210 (53.0%)	4,745 (5.7%)	13,090 (15.7%)	7,665 (9.2%)	13,690 (16.4%)

Source: These figures are based on NFPA's annual National Fire Experience Survey (http://www.nfpa.org).
Note: Prior to 1981, the categories were somewhat different.

In August 2008, the International Association of Fire Fighters (IAFF) issued a report on injuries from metropolitan departments. The report, *Contributing Factors to Firefighter Line-Of-Duty Injury in Metropolitan Fire Departments in the United States*, came to the following basic conclusions about firefighter injuries:

> Analysis of the roles of various factors suggests that the most prominent contributing factors to firefighter line-of-duty injury in metropolitan fire departments in the United States are lack of situational awareness (37.3%), lack of wellness/fitness (28.5%), and human error (10.6%) (http://www.iaff.org/08News/PDF/InjuryReport.pdf).

Fortunately, the statistics indicate that a large majority of injuries are not serious. According to the IAFF report, for almost 75 percent of the injuries, there were no days lost from normal duty. This study also reported that nearly 6 percent of injuries had significant impact on the firefighter's return to normal duty.

EXAMPLES OF FIREFIGHTER INJURIES AND FATALITIES

In this section we refer to real examples of how responders have been injured or lost their lives. These are provided to give students concrete examples (or awareness-cues) that can be useful when students are tapped to be the ISO.

The **lack of situational awareness** is one of the main causes of injuries according to the IAFF's August 2008 report. The ISO is an important contributor to Incident Command and Unified Commands' abilities to maintain situational awareness that is focused on safety for the public and for responders.

The major types of injuries received during fireground operations were:

- strains, sprains, and muscular pains--45.1 percent;
- wounds, cuts, bleeding, and bruises--18.2 percent;
- burns--6.9 percent; and
- smoke or gas inhalation--5.6 percent.

Source: NFPA Journal®, November/December 2008 (http://www.nfpa.org/publicJournalDetail.asp?categoryID=1692&itemID=40969&src=NFPAJournal&cookie%5Ftest=1).

Responders work in varied and complex environments that increase their risk of on-the-job death and injury. A better understanding of how these fatalities, nonfatal injuries, and illnesses occur can help Incident Command staff to minimize the inherent risks.

Looking at the reports of injuries and responder deaths, a set of questions may lead an ISO to an improved understanding of safety issues and concerns at an incident:

- What was the civilian life safety problem?

- What was the most significant safety problem identified?

- Was there evidence of an Incident Action Plan (IAP)?

- Was there an ISO?
- Was everybody accounted for at all times?
- Did communications contribute to the chaos?
- Was there a meaningful Command presence?
- Was span of control managed proactively?
- Was there evidence of freelancing by responders?
- What can we do different so that it doesn't happen again?

Responders don't have the power to stop a burning truss from failing, but they do have the power to make sure firefighters aren't there when it fails. After reading the fatality investigation reports accessible via the National Institute of Occupational Safety and Health (NIOSH), you may sense that the most dangerous factor is the uneducated, inexperienced, and overly aggressive responder.

NIOSH conducts investigations of fire-related incidents (*Fire Fighter Fatality Investigation and Prevention Program*). Students are encouraged to read these reports on a regular basis. These reports document deaths related to activities such as training exercises, structure fires, strenuous emergency calls, and vehicle crashes. These reports can be accessed at the Web site (http://www.cdc.gov/niosh/fire).

NOTE-TAKING GUIDE

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UNIT 2:
FATALITY AND INJURY DATA

Slide 2-1

Slide 2-2

OBJECTIVES

The students will:

- **Describe the impact of a responder fatality or serious injury.**
- **Identify the most common causes of firefighter fatalities and injuries.**
- **Identify common denominators at firefighter fatality incidents.**

Slide 2-2

Slide 2-3

INTRODUCTION

- **Incident Commanders (ICs) know that safety is the first priority at any incident.**
- **The Incident Safety Officer (ISO) is usually one of the first Staff positions appointed by the IC.**

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Slide 2-4

WHO IS THE INCIDENT SAFETY OFFICER TODAY?

YOU are!

- **You may be called on at any time to fill this critical position.**
- **This course will prepare you for those responsibilities.**
- **Can be the most rewarding professional assignment you will ever have.**

Slide 2-4

Slide 2-5

LINE-OF-DUTY DEATH

- **This is a tragedy that we all want to avoid.**
- **Impact is not just on the immediate family.**
- **The impact is felt on the entire department and can affect work relations and communications.**

Slide 2-5

Slide 2-6

LIFE SAFETY INITIATIVE
16 POINTS--4 CRITICAL TO THE INCIDENT SAFETY OFFICER

1. **Advocate leadership and personal responsibility for safety.**
2. **Focus on risk management at all levels: strategic, tactical, and planning.**
3. **Empower responders to stop unsafe practices.**
4. **Learn from injuries, fatalities, and near misses.**

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Slide 2-7

EVERYONE GOES HOME

- **Program promotes safety and training, and publicizes the need for safety.**
- **"Sudden cardiac death is consistently the number one cause of onduty firefighter fatalities in the U.S." (NFPA 2007)**

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RESPONDER INJURIES

- **Firefighter injuries (over 80,000 in 2006), of which approximately half were fireground related.**
- **International Association of Fire Fighters (IAFF)--August 2008--*Contributing Factors to Firefighter Line-Of-Duty Injury in Metropolitan Fire Departments in the United States.***
  - **Situational awareness.**
  - **Health/Fitness.**

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Slide 2-9

QUESTIONS

- **What was the civilian life safety problem?**
- **Were the injuries or deaths predictable?**
- **Could they have been avoided?**
- **Was the most significant problem identified?**
- **Was there an ISO?**
- **Was there evidence of freelancing?**
- **What can responders do differently?**

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Slide 2-10

SUMMARY

- **The ISO is critical to situational awareness.**
- **Students should find the data, the research, and the reports convincing.**
- **Better data about all response operations, civilians, and responders of all types would be good to know, but we know enough to tell us we can manage incidents better and safer.**
- **There are professional rewards and great satisfaction in doing this job well.**

Slide 2-10

UNIT 3:
PRINCIPLES OF RISK MANAGEMENT

OBJECTIVES

The students will:

1. *Discuss the classic Risk Management Model.*

2. *Describe the five components of the risk management process: risk identification, risk evaluation, prioritization of risks/threats, risk control measures, and monitoring of control measures.*

3. *Describe pre-emergency risk management, including written Risk Management Plans and how Risk Management Plans relate to the Incident Safety Officer's (ISO's) role.*

4. *Using scenarios, apply the risk management process to a variety of incidents.*

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INTRODUCTION

In the Post-Katrina Emergency Reform Act (October 2006), Congress endorsed a policy that the Department of Homeland Security (DHS) and the Federal Emergency Management Agency (FEMA) should be risk-based and all-hazards in perspective.

More and more, fire departments are being asked to adopt strategic plans that address community-based views of the risks or threats around them. For example, the Commission on Fire Accreditation International (CFAI) has issued a self-assessment guide book. The guide calls on fire departments to begin with an assessment of the risks or threats that they need to consider in their nearby communities, and then use this knowledge in their strategic planning efforts.

The National Fire Protection Association (NFPA) has long called for adoption of risk management plans by departments. NFPA 1500®, *Standard on Fire Department Occupational Safety and Heath Program,* includes Risk Management Plans as a requirement. This standard addresses operational, as well as, organizational views of risks.

We all know that emergency responders face risk. The threats are real and the consequences to responders themselves and to the public are real too. Risk management by responder organizations, such as fire departments and emergency medical services (EMS) organizations, is a conscious and planned effort to lower vulnerabilities and mitigate risks. This is accomplished by identifying and understanding the threats and preparing better to either avoid them or to respond to them when an incident arises.

At the time of an incident, the consequences for the public and for responders can be lowered if:

- Standard Operating Procedures (SOPs) and standards of safety are known and applied;
- equipment and tactical approaches are tested and used appropriately;
- responders gain and maintain situational awareness; and
- responders do their jobs with safety as the first priority.

The Incident Safety Officer (ISO) is the person called upon to translate Risk Management Plans and safety standards into safe strategies, tactics, and behaviors during the management of an incident.

COMPONENTS OF THE RISK MANAGEMENT PROCESS

The success of the ISO can depend on how well prepared the responders are and how well they accept their own organization's standards and operating procedures. Firefighters, EMS, and other responders should know about the Risk Management Plans that have been put in place for their organization. ISOs must also know about the risk management process since they need to communicate well to the various responder types about the rules and safety measures adopted by Incident Command or Unified Command.

An ISO can apply the basic components of risk management in their onscene role. The U.S. Fire Administration's (USFA's) publication, *Risk Management Practices in the Fire Service*, lays out five basic components for a risk management process:

1. Identification of potential risks or threats.

2. Evaluation of the probability of the potential risk or threats and the potential consequences to the public, property and the environment, and to responders.

3. Prioritization of the threats or risks.

4. Development and implementation of control measures to lower the risks (and their consequences).

5. Monitoring of control measures to ensure their effectiveness.

These five steps are discussed in detail in the following subsections. Fire and EMS departments and other responder organizations can use these components to help them form and maintain pre-emergency Risk Management Plans.

Once created, these plans should be periodically updated based on conditions, circumstances, and experience. It is a fundamental tenet of risk management that it needs to be a process that is

- ongoing;
- evolving;
- regularly refreshed; and
- a continuously improved process.

Risk Identification

Risk can be defined as anything that could go wrong. A risk might be associated with a training exercise, an emergency medical incident, or a fall in the station. Identifying the risks may be a complex process because you may be trying to identify what "may" happen. Identifying risk is a simple process if the risk is obvious.

Within the community, you may identify commercial buildings and industrial sites where there are risks. Critical infrastructure and key resources (CIKR) may be a target of terrorists or simply recognized as having important consequences if an incident cannot be stabilized easily at this site. Your own data should help you identify frequent locations where incidents occur. A good Risk Management Plan begins with a comprehensive inventory of all things that might go wrong.

Responding organizations should have compiled a list of all emergency and nonemergency operations in which their organization participates. There are many sources to assist with this identification process. Students should look toward the local, regional, and State emergency management plans as sources of threat or risk identification.

Organizations should also seek input and ideas from other personnel, trade journals, professional associations, and other service providers and responder organizations including the police, fire, public health, emergency medical response organizations, and others.

Risk Evaluation

Once the risks are identified, they can be evaluated from the standpoint of both frequency and the type and severity of consequences. Risk evaluation in the classic risk management process involves two terms: **frequency** and **severity**.

The term "frequency" addresses the likelihood of occurrence. Typically, if a particular type of injury (e.g., back injuries) has occurred repeatedly, these incidents will continue to occur until effective control measures are implemented. The process of evaluating risks will explain how often a risk is likely to occur. There are no hard and fast rules for what frequency is acceptable. It is a subjective measure, which is dependent on the individual, organization, and the person doing the evaluation.

The term "severity" addresses the degree of seriousness of the incident. It addresses how great the loss is, or what the consequences of the risk are if the incident occurs, or if it is unmitigated by response actions or control measures. Severity can be measured in a variety of ways, for example:

- loss of life;
- number of injuries;
- number of serious injuries;
- degree of public health impacts; and
- extent of environmental damage, and so forth.

Consequences can be also measured by such things as:

- disruption of the economy of an area;
- time away from work;
- cost of damage;
- cost of and time for repair or replacement;
- disruption of service; and
- impact on organizations, including their legal costs.

Using the information gathered in the identification step, the risks can be classified based on severity or consequence and frequency. Figure 3-1 is a simple table that can be used.

Risk or Threat	Frequency	Measures of Severity or Consequence
Name of an operational risk	• Every day • Seldom • Almost never	• Not severe • Significant influence on community • Catastrophic effects
Name of an organizational risk	• Every day • Seldom • Rarely	• Minor • Significant to those affected • Serious and life-threatening

Figure 3-1
Illustration of a Risk Table

The operational risks are likely to depend greatly on the organization you work for, where you are located, and what mutual-aid agreements affect you.

Organizational risks are more well-known, of course, and they form the basis for most of an organization's Risk Management Plan.

FEMA recognizes another factor, **vulnerability**. Organizations are asked to consider how vulnerable a place or site is to a threat. Some places are less vulnerable than others. An older building built before sprinklers were required may be more vulnerable to a fire than a newer building with sprinklers. A well-managed industrial site that has adopted and tested a number of safety and security measures is less vulnerable than a site that has no plans or measures in place.

Establishing Priorities

Once the frequency and severity of an incident are determined, an organization has some measure that helps it decide which risk or threat has a higher priority in its plans than other risks or threats. Organizations need to prioritize the risks because budgets are limited, and there are some things that are not well controlled by a fire department or an EMS organization. The attention of the organization should be responsibly applied based on some priority scheme.

Any risk that has a high probability of occurrence **and** serious consequences deserves a high priority. A nonserious incident with a low likelihood of occurrence should be a low priority. This incident may get no attention at all. Note that establishing priorities involves a great deal of subjectivity, particularly for emergency response organizations like fire and EMS. For instance, a risk that has a low probability of occurrence may bring with it very serious consequences. In this case, an organization or community may demand that this risk be addressed as a priority.

Figure 3-2, illustrates a four-part way to think of risk. The boxes on the right include threats or risks that occur frequently. The upper boxes include risks that, if they occur, have high

consequences. This simple XY Graph illustrates that the box in the upper right should get significant attention. The items found in the box on the lower left, in contrast, probably ought to have little to no attention.

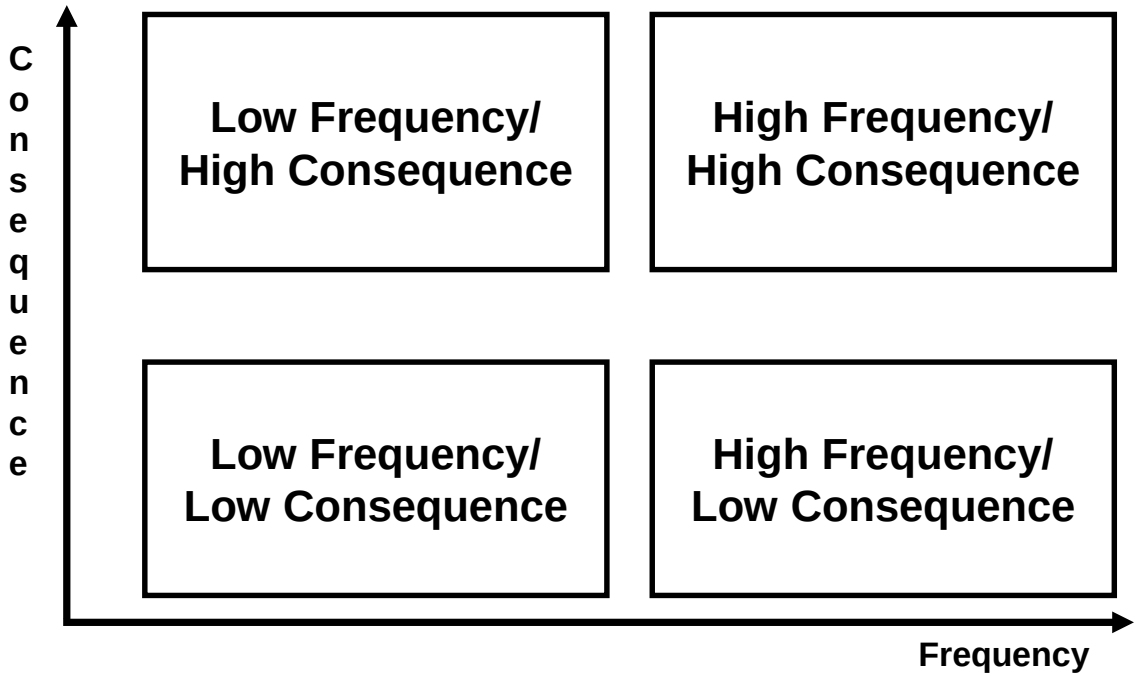

Figure 3-2
XY Graph for Prioritizing Risk

Risk Control Measures

At this point in the process, risks have been identified and evaluated, so it is time to consider solutions. The ISO can draw on a number of basic risk-control approaches including risk avoidance, implementation of control measures, and risk transfer. Risk control measures are any solutions used for the elimination or reduction of real or potential hazards or risks through the implementation of controls.

In any situation, the best choice is **risk avoidance**. Simply put, this means avoid the activity or hazard that creates the risk. In an emergency services organization, this frequently is impractical. Lifting a stretcher presents a serious back injury risk, but one cannot avoid this risk and still provide effective service.

An example of risk avoidance that has been very practical is the use of sharps containers. The risks associated with recapping needles are well documented, so recapping is no longer an accepted practice. This risky behavior can be avoided through the proper use of a sharps container.

The most common method used for the management of risk is the adoption of effective **risk control measures**. While control measures will not eliminate the risk, they can reduce the likelihood of occurrence or mitigate the severity. Safety programs, ongoing training and education programs, and well-defined SOPs are all effective pre-emergency control measures that are to be applied on scene.

For example, a collision between emergency response vehicles and other vehicles is a risk at intersections. This risk has a relatively high frequency of occurrence and the consequences are severe. SOPs that require a full stop at red lights and at other "negative" rights-of-ways can help to control both the frequency and severity of such collisions. EMS personnel also take steps to keep traffic away from their work areas as a risk control measure.

Communicable diseases pose a real risk and an infection control program should be established and understood by everyone. The control measures for infectious disease should address immunizations, training and education (pre-emergency), personal protective equipment (PPE) aspects, exposure management, cleaning and disinfecting, facilities and vehicles, and disposal rules.

Risk transfer is a common strategy for many organizations. Transfer of risk isn't easily applied to most operational risk scenarios. Still, there are areas for which organizations can transfer risk to those who are better prepared to handle them. For example, organizations might transfer risk to outside firms to:

- clean contaminated materials and equipment;
- inspect gasoline tankers; and
- provide special ambulance services to handle the routine transfer of a person who needs protective isolation.

Other organizations can shift financial risk by purchasing insurance. Of course, the idea that there is a financial risk transfer to insurers has no bearing on the operational duties of responders.

Risk Monitoring

The last step in the process is risk management monitoring. Once incident control measures have been implemented, they need to be evaluated to measure their effectiveness. Any problems that occur require revisions or modifications to the operational strategies, tactics, or other control measures. This final step ensures that the system is dynamic. The reporting of the data will also facilitate periodic reviews of the entire safety program.

The intent of the Risk Management Plan is to develop a strategy for reducing the inherent risks, lowering the frequency of occurrence, lessening vulnerabilities, and lowering the consequences. Regardless of the size or type of organization, every responder organization should operate using risk management principles.

Organizational risk management from NFPA 1500®.

> **Risk Management (organizational risk definition)**
>
> The process of planning, organizing, directing, and controlling the resources and activities of an organization in order to minimize detrimental effects on that organization.
>
> ***NFPA 1500®***

The primary focus of internal or organizational risk management is the safety and health of personnel.

Note that in NFPA 1500®, organizational risk management was addressed in the administrative requirements of the standard.

The Risk Management Plan for a fire department organization will include an Occupational Safety and Health Program. The program needs to be both proactive and functioning. This plan will also identify and explain each standard of safety for the daily operations of the organization. A standard of safety establishes the parameters within which operations are conducted during both emergency and nonemergency situations. The intent is for all personnel to operate within these standard levels of safety and not to deviate from them. The plan should also explain how incident personnel should assess the safety issues for each type of incident they confront. An ISO will be expected to employ the safety standards and the management processes detailed in their organization's plans and as established by Incident Command.

PRE-EMERGENCY RISK MANAGEMENT

Pre-emergency risk management looks at activities that take place prior to any emergency. It uses the classic Risk Management Model approach to prevent, prepare for, and establish control measures anticipating problems so that onscene risk management is easier to perform and more effective.

Three initial components of pre-emergency risk management include

1. a written Risk Management Plan;
2. a written Occupational Safety and Health Program; and
3. a Risk Management Toolbox.

Each will affect the daily operations of the organization based on local factors such as philosophy, implementation, and management. Each of these pre-emergency risk management components will be expanded in further detail so they can be understood and recognized clearly for the importance they play in the overall risk management process.

Most organizations have used a written Occupational Safety and Health Program for years, and use a Health and Safety Officer (HSO) to oversee its management and use.

Written Risk Management Plan

Risks are identified and evaluated, priorities determined, and control measures established.

A written Risk Management Plan will include the results of this process along with the review of the organization's health and safety policy and procedures. By formulating this plan, the organization is taking steps to avoid or control the risks (which also will help to protect against liability). The resulting plan will define how tasks, functions, or operations can be conducted in the safest manner possible. The ISO will draw upon and use many of the components of the Risk Management Plan.

The Risk Management Plan should address every function of the organization. There is a long list of operating areas that needs to be reviewed in order to establish a sound Risk Management Plan for a fire department or EMS organization. A good plan will have considered the organizational and the onscene risks associated with the following:

- dispatch procedures;
- operations at emergency incidents (e.g., the Incident Command System (ICS), SOPs, and Standard Operating Guidelines (SOGs) are tested and analyzed);
- multiagency and multijurisdictional situations;
- radio communications agreements;
- physical fitness and skills of personnel;
- stress management;
- vehicle operations;
- PPE;
- debriefing effectiveness;
- documentation practices;
- safety standards and related standards such as response times;
- operations at nonemergency incidents;
- hiring selection;
- employee attrition;
- training and continuing education;
- probationary employment and supervision;
- inspections and maintenance of facilities;
- controlled substances handling;
- hazardous materials (hazmat);
- infectious disease;
- incidents involving violence;
- mutual-aid interactions; and
- other related activities.

Written Occupational Safety and Health Program

The safety, health, and welfare of personnel is one of the most important responsibilities for a department chief or other top administrator in the operation of a responder organization. The lack of personnel, who may be absent because of occupational injuries or illnesses, disrupts the operation of the organization, affects morale, and diminishes the organization's effectiveness.

The safety and health program outlines procedures for department personnel that, if followed, will enable them to perform their daily duties and responsibilities in a safe and effective manner. **An effective written program places the responsibility and authority for safety on all personnel.** It holds supervisors accountable for ensuring that personnel understand and comply with the requirements of this program.

There is no set method for developing a safety and health policy. The policy may be a single affirmation or may be part of an SOP manual. Whatever method is used, all personnel must be provided with training and familiarization so they understand the intent and concept of this policy.

Risk Management Toolbox

Within the pre-emergency risk management process, there is a long list of elements to address. Several tools are used by an organization to establish an effective risk management program. You can consider these a Risk Management Toolbox.

The ISO should have this toolbox in mind. Some of the key elements of such a toolbox are

- ICS;
- SOPs (and SOGs, as used by some organizations);
- PPE and clothing;
- apparatus and equipment;
- a personnel accountability system;
- qualified personnel; and
- communication system.

Standard Operating Procedures and Standard Operating Guidelines

SOPs/SOGs are written policies developed by an organization that define exact methods or activities performed by its members. These procedures affect only the operation of the organization that writes and adopts them. The requirements of these procedures must be based on recognized laws and regulations. SOPs/SOGs are the foundation from which an organization functions on a daily basis. They should cover all the organization's operations--both emergency and nonemergency.

As SOPs/SOGs are developed and written, training must take place in order for personnel to understand what is expected of them. Once the SOPs/SOGs become effective, they become enforceable within that organization. An ISO is expected to contribute to incident management applying these SOPs/SOGs where appropriate and the safety measures adopted by Incident Command.

As departments or organizations use SOPs/SOGs, there must also be a process for reviewing and amending them. This process needs to identify the effectiveness of the SOPs/SOGs--are they being used and what have been the results when they are used. If the SOPs/SOGs are not being followed or the results can be improved, then the SOP/SOG should be changed. Some SOPs/SOGs may be unnecessary. SOPs/SOGs that are on the shelf for the sake of being on the shelf do no good. This is why it is important to have a systematic process to review the SOPs/SOGs on a regularly scheduled basis. An ISO will provide input to after-action reports that can be used to improve an organization's SOPs/SOGs.

Effective Training

Training is vital. It ensures consistency, efficiency, accountability, and safety. Without training, an incident scene can become harder to manage successfully. Untrained personnel can be liabilities at a scene and a cause of injuries and avoidable losses. Note that shortfalls in training will undoubtedly expose the organization to litigation brought by patients, victims' families, and responders. An ISO needs to be attentive to the qualifications of responders and how these fit their assignments.

The training process is an avenue for testing and evaluating new or revised SOPs or policies. Training is also the approach for instituting and enforcing the safety process in a nonemergency mode or setting.

Also note that a training exercise can be one of the most dangerous nonemergency activities engaged in by the organization. An ISO should be involved in training exercises.

The Risk Management Plan should ensure that training situations, like live-fire evolutions, are specifically addressed. In all such training exercises or "incidents," the role of the ISO should be established, and the lessons of this course and the more advanced ISO courses should be applied. Approximately 10 percent of line-of-duty deaths (LODDs) and injuries for firefighters occur during training.

Personal Protective Clothing and Equipment

Prior to participating in any emergency operation, an organization must define what the minimum level of protective clothing should be for its personnel to conduct activities.

The organization has the obligation to ensure that the equipment provided to personnel is compliant and meets the intent for which it will be used. A risk management program and

Occupational Safety and Health Administration (OSHA) compliance will ensure that all personnel understand the use and limitations of the respective PPE.

Note that PPE is tested to ensure it meets certain standards. This means that PPE may fail once it falls outside the standard limits (e.g., protective gloves have varying thicknesses; there is a defined temperature limit for turnout gear). The maintenance and care of protective clothing is also important. Poorly maintained protective clothing and equipment may lead to accidents and injuries. The manufacturer's recommendations should be followed with respect to cleaning and repair of clothing and equipment.

An ISO and any assigned Assistant Safety Officers should take steps to ensure that responder personnel have the appropriate PPE and are using them correctly.

Apparatus and Equipment

The apparatus and equipment that is used for emergency operations must be properly maintained to maximize safety. The supplies, associated PPE, and special equipment should be on board in proper working order. A Risk Management Plan should address:

- the procedures that are used to ensure that equipment is on board;
- preventive maintenance program for apparatus and equipment; and
- "emergency driving" rules and practices.

The preventive maintenance program will ensure that routine maintenance and repairs are performed on apparatus on a scheduled basis. There will be criteria in place that allow apparatus to be placed out of service if certain conditions exist (e.g., poor brakes). Maintenance and repairs performed on the apparatus must be performed or completed by certified mechanics.

An ISO should be concerned about apparatus and equipment, and report any need for repair or maintenance if operational safety is affected. An ISO should also ensure that safe driving rules are being followed.

Incident Command System and Safety

The Command and control of an incident is the key to an effective, efficient, and safe operation. Safety is the first priority recognized by all emergency management organizations. The risks are too great to allow an incident to be managed in an aimless and chaotic manner.

The role of the ISO is to focus on the assessment and identification of risks, the establishment of safety priorities, and the safety control measures that are needed for an incident or event. The ISO role may be performed by the Incident Commander (IC). This is the case for most of the incidents and events faced on a day-to-day basis.

The next unit of this course covers the basics of the National Incident Management System (NIMS)/ICS adopted by FEMA and the National Fire Academy (NFA). Most State laws and the Emergency Management Assistance Compact (EMAC) expect this ICS model to be used by responder organizations of all types. EMAC has been adopted by all States and territories.

Through SOPs, an organization should provide for an incident safety approach that calls for:

- the assessment of risks;
- input into incident action planning and decisionmaking;
- input into strategies and tactical designs; and
- a role in Command and control.

Note that under ICS, the ISO is part of the Command Staff and should be able to order a halt to any action they deem to be outside the safety standards of the organization, or the standards adopted by Incident Command.

Personnel Accountability System

Managing an incident scene and maintaining the accountability for personnel are functions of Incident Command and the responsibility of all supervisors and personnel. Being able to account for the location of each responder at an emergency incident is imperative. The ISO has a critical role in ensuring that a personnel accountability system is established at every incident or event.

Such a system stems from the implementation of a Risk Management Plan that includes safety standards, incident-specific assessment guides, and SOPs that make all personnel responsible for knowing the location of all incident personnel, and what safety issues or problems are being confronted at all times.

We know that even with SOPs, training, and the full commitment of the organization to its safety standards, "freelancing" still exists. The adoption of a thoughtful personnel accountability system is an excellent control measure that is expected to be one of the most important elements of a risk management approach for any incident.

RECOGNITION-PRIMED DECISION MAKING

The ISOs will be dependent upon the Risk Management Plans of the responding organizations and the buy-in of their personnel. The ISO's job can be more successfully accomplished if these Risk Management Plans have been fully implemented. Organizations with fully-implemented plans will bring responders to incidents who expect an ICS to be in effect, who know about safety standards, who participate actively in the assessment process, and who look for and try to follow the safety control measures established by Incident Command.

ISOs must play a lead role from the start of an incident, through the time when resources are being demobilized, and until recovery has been completed. Throughout this period, from start to

finish, the ISO is responsible for taking the lead on the assessment of risks and how these are translated into Incident Action Plans (IAPs) and safety control measures.

The NFA believes that the ISO can look for incident cues that help with their decisionmaking as an ISO. The NFA also recognizes that responding personnel frequently follow the cues that are comfortable or known to them. ISOs need to be aware that responders apply their experiences and lessons that they know, when they are on scene.

Gordon Graham, a California risk management consultant, has added a new twist to the time-honored frequency/severity matrix that was shown in Figure 3-1. He maintains that high-frequency events are managed correctly most of the time since responders have seen these types of situations before and know what to do. More problems and danger are presented to responders in low-frequency events, since responders and Command staff have little or no experience to call upon.

He explains that people have a "hard drive" inside their head where incident cues and responder actions are linked. Life and professional experiences are stored on the "hard drive." Each time we have an experience, information about what worked and what did not work is loaded. When we are presented with a situation, such as a structure fire, we unconsciously take what we see and attempt to match it with the situations we have seen before and stored on our "hard drive." If we have an apparent match, we take the information that we have stored about what works and what does not work, and attempt to apply it to the present situation. In the vast majority of high-frequency events, our past experience helps us manage the situation.

Mr. Graham is discussing a concept now called Naturalistic Decision Making (NDM). This concept (formerly termed Recognition-Primed Decision Making) evolved from military research in the 1980s. The military found that experienced battlefield commanders quickly analyzed a small number of variables when presented with a situation. The commander used the outcome of this rapid analysis to make decisions on what should be done, based on the "hard drive" in their head.

NDM can be used to train responders for infrequent high-risk situations by regularly presenting these less-known situations in training. As the situations are managed in training, the experience becomes a part of the "hard drive." When the event happens, the responder can recall the training. NDM used in training can better prepare emergency responders to work safely.

As we know, however, in emergency services things are not always what they seem to be. A danger exists if we view all similar situations as if they are the same. There are situations where what worked fine the last time does not work well in the present emergency. Failure in this case may stem from the base of knowledge within the "hard drive" and how it is used by the responder. For example, many fire departments are dealing with the need to convert a "residential" fire mentality that is unconsciously applied to all wildland or structural fire events. If a set of tactics that worked well for fighting 30 residential fires is applied to a fire in a commercial structure, the results may not be the same.

Mr. Graham adds another concept, **discretionary time**, to our understanding of the upper left box where low frequency but highly consequential risks are listed. When we have the benefit of more time in the management of an incident, such as occurs with a hazmat incident with no immediate life threat, there is the opportunity to back away from the hazard. The extra time affords responders the ability to research alternatives, call in technical experts, or use regional resources to address the problem.

High-consequence, low-frequency situations, in which there is no time to back off and make decisions, **pose the most extreme levels of risk to responders and response organizations.** Responders are handicapped in these situations both by very little information and by very little time. Situational awareness is not an obvious thing when there are few examples contained in the "hard drive" for supervisors and responders to draw on.

Note that Graham's risk management concepts can be applied to nonemergency and pre-emergency risk management as well as emergency situations.

The ISO needs to play a critical role in helping to ensure that assessments appropriate to the incident are being accomplished and that Incident Command or Unified Command have the continuous benefit of a careful translation of the standards into safety measures within the IAPs.

SUMMARY

For risk management efforts to be successful, a process must be developed and used with **all** members of the organization so they understand the concepts, philosophies, and importance of risk management to themselves and to their communities. ISOs can be more successful in their role if good Risk Management Plans are fully adopted and used by response organizations and responders, including those who self-deploy. ISOs should draw upon the Risk Management Plans of responding organizations.

A Risk Management Plan should result in better prepared supervisors and responders. The risk and problem identification efforts used in risk management require considerable factfinding and information-gathering. Note that while ISOs must perform incident-specific assessments as part of their continuous responsibilities, they can draw upon the risk management process to do these assessments. Of course, if the assigned ISO is the person who led the establishment of the organization's Risk Management Plan, the ISO's "hard drive" will have a lot of data and relevant experiences to draw upon for use at an incident.

Activity 3.1

Risk Management Plan for a Specific Risk

Purpose

To give you an opportunity to make quick decisions based on the safety cues you see, and to apply a Risk Management Plan in response.

Directions

1. You will be instructed, as small groups or as a class, to identify the risks associated with your assigned photographs. The instructor will advise you to use the following Worksheet or an easel pad.

2. After you have identified the risks, evaluate the risks and provide the necessary control measures needed to ensure the safety of members operating at the scenario shown.

3. You will have 10 minutes to complete this activity. A general discussion will be held after completion of the activity.

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Activity 3.1 (cont'd)

Worksheet

Scenario 1: Highway/Traffic Incident Involving Fire Department Apparatus

Risks:

Evaluation:

Control Measure(s):

Scenario 2: Technical Rescue

Risks:

Evaluation:

Control Measure(s):

Scenario 3: Overturned Tanker--Hazardous Materials Incident

Risks:

Evaluation:

Control Measure(s):

Scenario 4: Commercial Structure Fire

Risks:

Evaluation:

Control Measure(s):

Scenario 5: Vehicle Accident

Risks:

Evaluation:

Control Measure(s):

Scenario 6: Vehicle Accident Involving Propane Truck

Risks:

Evaluation:

Control Measure(s):

NOTE-TAKING GUIDE

Slide 3-1

UNIT 3:
PRINCIPLES OF RISK MANAGEMENT

Slide 3-1

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OBJECTIVES

The students will:

- **Discuss the classic Risk Management Model.**
- **Describe the five components of the risk management process: risk identification, risk evaluation, prioritization of risks/threats, risk control measures, and monitoring of control measures.**
- **Describe pre-emergency risk management, including Risk Management Plans and how Risk Management Plans relate to the Incident Safety Officer's (ISO's) role.**
- **Using scenarios, apply the risk management process to a variety of incidents.**

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INTRODUCTION

- **Communities, including fire, emergency medical services (EMS), and law enforcement agencies are assessing risks and threats around them.**
- **Knowledge of these threats can be used in strategic planning efforts.**
- **Using this information, risk management protects both responders and the public.**
- **Same principles can be applied at an incident or event.**

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Slide 3-4

CONSEQUENCES CAN BE LOWERED

If:

- **Standard Operating Procedures (SOPs) and standards of safety are known and applied.**
- **Equipment and tactical approaches are tested and used appropriately.**
- **Responders gain and maintain situational awareness.**
- **Responders keep safety as the first priority.**

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BASIC ROLE OF THE INCIDENT SAFETY OFFICER

The person who translates Risk Management Plans into strategies, tactics, and behavior during an incident

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APPLY THE FIVE-STEP RISK MANAGEMENT PROCESS

1. **Identification of potential risks or threats**
2. **Evaluation of probability and the consequences to the public and responders**
3. **Prioritization of risks and threats**
4. **Implementation of control measures**
5. **Monitoring of control measures**

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RISK IDENTIFICATION

- What might go wrong?
- It's simple if risk is obvious.
- Make an inventory of what could happen.
- Seek input from others.

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RISK EVALUATION

Involves two terms:

- Frequency--likelihood of occurrence.
  - Has this occurred repeatedly?
- Severity--measured by factors such as:
  - Loss of life.
  - Number of injuries.
  - Number of serious injuries.
  - Degree of public health concerns.
  - Extent of environmental damage.

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Slide 3-9

ADDITIONAL CONSEQUENCES

- Time away from work
- Cost of damage
- Cost of and time for repair or replacement
- Disruption of service
- Impact on organizations and their legal costs

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ESTABLISHING PRIORITIES

- **Is there a high probability of occurrence?**
- **Will there be serious consequences?**
- **This combination would be a high priority.**
- **The XY Graph.**

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RISK CONTROL MEASURES

Definition: Any solution used for the elimination or reduction of real or potential hazards or risks through the implementation of controls.

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RISK AVOIDANCE

- **Best choice is always risk avoidance!**
- **Example of risk avoidance-- sharps containers.**

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RISK CONTROL MEASURES (cont'd)

- Most common method used for risk management
- Can reduce likelihood of occurrence
- Can mitigate severity
- SOPs, change in strategies and tactics, use of different personal protective equipment (PPE), other measures

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RISK TRANSFER

- Difficult to use in responder situations.
- It is the job of emergency services personnel to respond--risk cannot be transferred.
- Question--Is there someone else better qualified?
  - Hazardous materials.
  - Electrical hazards.
  - Fuel spills.

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RISK MONITORING

- Once control measures have been implemented, they need to be evaluated to measure effectiveness.
- Risk management reduces inherent risks, lowers the frequency, and lowers the consequences.

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NATIONAL FIRE PROTECTION ASSOCIATION 1500® --ORGANIZATIONAL RISK

- **"The process of planning, organizing, directing, and controlling the resources and activities of an organization in order to minimize detrimental effects on that organization." (NFPA 1500®)**
- **The primary focus of internal, or organizational risk management is the safety and health of your organization's personnel.**
- **Under the National Incident Management System (NIMS)/Incident Command Systems (ICS), the Safety Officer on the incident is to be focused on all safety matters for the public and for responders.**

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PRE-EMERGENCY RISK MANAGEMENT

- **Looks at activities that take place prior to any emergency**
- **Prepares for and establishes control measures, like SOPs, anticipating problems**
- **Should prepare toolkits that will be available to assist an ISO**

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PRE-EMERGENCY RISK MANAGEMENT (cont'd)

Necessary components:

- **A written Risk Management Plan**
- **Occupational Safety and Health Program**
- **A Risk Management Toolbox**

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ELEMENTS IMPORTANT TO THE INCIDENT SAFETY OFFICER

- Incident Command models and multiagency/ multijurisdictional agreements
- Dispatch procedures
- Physical fitness of personnel
- Training and qualifications of responders
- Vehicle operations
- Hazardous materials
- Infectious disease
- Radio communications agreements

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RISK MANAGEMENT TOOLBOX

Key elements:

- ICS
- SOPs/Standard Operating Guidelines (SOGs)
- PPE and clothing
- Apparatus and equipment
- Personnel accountability system
- Others

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RECOGNITION-PRIMED DECISION MAKING (NOW CALLED NATURALISTIC DECISION MAKING)

- The ISO should look for incident safety cues.
- Recognize that responders follow patterns based on cues too, but they may not see the cues the same way, or pick the same patterns to guide their actions.
- Low-frequency, high-consequence events produce the most risk.
- The ISO is critical to maintaining situational awareness and operational safety.

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SUMMARY

- **To be successful, risk management principles should be used by Incident Command and Command Staff.**
- **Risk Management Plans should result in better prepared supervisors and responders.**
- **Risk management principles can be applied on scene by the ISO.**

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Activity 3.1
Risk Management Plan for a Specific Risk

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UNIT 4: SAFETY RESPONSIBILITIES

OBJECTIVES

The students will:

1. *Describe how the roles of the Incident Commander (IC), Health and Safety Officer (HSO), and Incident Safety Officer (ISO) interrelate.*

2. *Become familiar with the National Fire Protection Association (NFPA) 1500®*, Standard on Fire Department Occupational Safety and Health Program *and NFPA 1521®*, Standard for Fire Department Safety Officer *as they relate to the functions of the ISO.*

3. *Using scenarios, write a Hazard Risk Analysis (using Incident Command System (ICS) Form 215A,* Incident Action Plan Safety Analysis*).*

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INTRODUCTION

The safety of everyone on the scene of an emergency incident is the ultimate responsibility of the Incident Commander (IC). When an incident is complex or large, the IC or Unified Command will establish an Incident Safety Officer (ISO). The ISO will bring appropriate attention to all the safety aspects of operations and to the safety of response personnel. Under the Incident Command System (ICS), the ISO reports directly to the IC.

The ISO's responsibilities are laid out in the ICS and they are also covered by many of the requirements found in National Fire Protection Association (NFPA) 1500®, S*tandard on Fire Department Occupational Safety and Health Program* and NFPA 1521®, *Standard for Fire Department Safety Officer*. This unit covers the basics of the ICS and these NFPA standards.

We already know that everyone at an incident scene is responsible for safety. The coordinated effort of chiefs, directors, supervisors, team leaders, and responders from all organizations assures firefighters and emergency medical services (EMS) personnel that they will be working on scene with safety matters properly managed, allowing them to do their jobs.

The Risk Management Plans of a responder's organization lay the groundwork for proper management of an incident. Risk management for most fire departments and EMS organizations grows out of the organization's efforts to comply with the laws that apply to the jurisdiction. The safety groundwork of plans and policies, training and proper equipment, is turned into action by the ICS, and through the efforts of the ISO and his/her assistants.

Safety is the responsibility of department chiefs and the leaders of each involved EMS organization, other responding agencies, and the authorities within the jurisdiction where the incident exists. The ISO should be able to draw upon his/her leadership in support of both public and responder safety.

INCIDENT COMMANDER

The first ISO at an incident is the IC. An IC is likely to remain the ISO in the case of most of the day-to-day incidents faced by EMS organizations and fire departments. The IC is the ultimate Safety Officer for any incident. Individuals who may be called upon to be an ISO for an incident must have a solid understanding of the IC's responsibilities.

In large or complex incidents, the IC's focus is on strategic issues, comprehensive strategic planning, the assignments of objectives, and the maintenance of action plans that span all aspects of incident management. He/She should employ risk management principles. The IC evaluates the acceptable levels of risk in relationship to saving lives, in bringing stability to the incident, and for conserving property and the environment. These are the three accepted priorities under the National Incident Management System (NIMS)/ICS. The role of the ISO is to use effective strategies and justifiable tactical operations to minimize risks that cannot be avoided or eliminated completely.

The IC has overall responsibility for the safety of responders working at an emergency scene. The ISO assists the IC and acts as the IC's eyes and ears on matters related to safety. The appointment of an ISO should be a common practice to ensure that this function is done properly.

The ISO reports directly to the IC. Direct access to the IC allows the ISO to transmit his/her information directly without the message becoming scrambled in transmission. This relationship reflects the importance of the ISO's role at the emergency scene. Since safety is the first priority, the IC must address whether there is an immediate need for an ISO within the Command Staff. The IC should ensure that scene-access controls, safety protocols, and incident strategies are consistent and are being followed at all times.

INCIDENT ACTION PLAN

The Incident Action Plan (IAP) defines the strategic goals, tactical objectives, risk management, member safety, and supporting requirements for an incident. For small or simple incidents, such as a one-car traffic accident, the IAP normally is relayed verbally.

For large or complex incidents, such as a hazardous materials (hazmat) incident that lasts for many hours, the IAP usually is in written form. The IC may require a written IAP for any incident. He/She has the overall responsibility for developing and maintaining the IAP throughout the incident. A Planning Section is also part of the ICS model. It is usually needed in any large or complex incident. It develops the documents used in the Command and General Staff's consideration of the objectives, strategies, and tactics addressed in the IAP. The IAP is formed with input from the appropriate sections and staff, including the ISO.

While the IAP is written and approved for an entire operational period, strategies and tactics will change as often as circumstances require. The ISO **must** contribute to the IAP, addressing life-safety matters for the public and for responders.

INCIDENT SAFETY OFFICER

While the IC has **overall** responsibility for life safety, the ISO has the **direct** responsibility for life safety. The ISO focuses on the safety aspects of the incident, including the welfare of the responders assigned to the incident.

The ISO is a member of the Command Staff responsible for monitoring incident operations and advising the IC and Operations on all matters relating to operational safety, including the health and safety of emergency responder personnel. The Safety Officer must monitor and assess the safety hazards and unsafe situations to develop measures and advise on strategies and tactics.

The Safety Officer is responsible to the Incident Command/Unified Command for the systems and procedures necessary to ensure

- the ongoing assessment of hazardous environments;

- the coordination of multiagency safety efforts;
- the implementation of measures to promote emergency responder safety; and
- the general safety of incident operations.

The ISO has authority to stop and/or prevent unsafe acts during incident operations. It is important to note that the agencies, organizations, or jurisdictions that contribute to joint safety management efforts will maintain their individual identities. They also remain responsible for their own programs, policies, and personnel. Each contributes to the overall effort to protect all responder personnel involved in incident operations.

The ISO also keeps the IC informed of present problems and potential hazards. He/She should identify problems and suggest solutions to minimize the risks. For a Safety Officer to be truly effective, he/she should have knowledge of the many types of risks. The Safety Officer also needs operational knowledge including knowledge of EMS protocols and incident-type-specific strategies and tactical approaches. Some of these are covered more in the later units of this course. Special hazard incidents require specific knowledge in areas such as swift water events, confined space rescue, and hazardous materials (hazmat).

The ISO has the authority to bypass the chain of command when it is necessary to correct unsafe acts immediately, such as removing all personnel from areas of imminent danger. The IC must always be informed of these corrective actions.

INCIDENT SAFETY OFFICER FUNCTIONS

NFPA 1500® **and** 1521® define the ISO as an individual who is either appointed to respond to or assigned at an incident scene by the IC to perform the duties and responsibilities specified in these standards. For obvious reasons, in the case of fire departments, this individual is frequently the Health and Safety Officer (HSO) for the department.

Both NFPA standards and the ICS model encouraged by the National Fire Academy (NFA) give the ISO the authority to alter, suspend, or terminate unsafe acts or hazardous activities. NFPA's standards do not require the ISO to be an officer. The ICS is performance-based and recognizes that the ISO can come from any organization or agency and hold any rank (ICS does not use rank; it is based on qualifications).

NFPA 1521® contains the job requirements, duties, and needed knowledge of the ISO. Fire departments are required by this standard to establish criteria for the appointment of an ISO and the fire department's Standard Operating Procedures (SOPs) must clearly identify this assignment process.

Note that the NFPA standards are conforming with NIMS. Conformity was one of the goals of the 2008 revision process for NFPA 1521®. This particular NFPA standard addresses several key points about the ISO:

- The ISO must monitor responder safety on the scene and make sure that actions fall within the department's Risk Management Plan. If activities fall outside of the plan, the ISO has the authority to terminate or suspend them.

- The ISO, and any Assistant Safety Officer, must be clearly identified on the scene. The ISO must make Command aware of the need for Assistant Safety Officers.

- The ISO must review the IAP and provide the IC with a risk assessment based on the plan.

- The ISO must monitor the scene and provide the IC with reports on conditions, hazards, and risks.

- The ISO must make sure that the IC establishes a rehabilitation component.

- The ISO must assure that the department's accountability system is in use.

- The ISO must assure that collapse zones, hot zones, and safety zones are known to all members operating on the scene.

- The ISO must monitor vehicle traffic near an incident to ensure the safety of responders, which may cause apparatus to be repositioned to provide a shield. The ISO also must assist in the safe establishment of landing zones when helicopters are used at incident scenes.

- While on the scene of a structural fire incident, the ISO must assure that Rapid Intervention Crews (RICs) are in place, advise the IC on the potential for building collapse or fire extension, rapid fire progress, and access and egress for crews fighting the fire.

- While on the scene of an emergency medical incident, the ISO must assure that proper infection control practices are in active use and that rehabilitation and Critical Incident Stress Management (CISM) are activated when needed.

- While on the scene of a hazmat or special operations incident, the ISO must attend planning sessions to provide safety input, assure that a safety briefing for all responders is conducted, develop and distribute a safety IAP, assure the designation and marking of hot, warm, and decontamination zones, and meet with the IC to assure that rehabilitation, accountability, RICs, and provisions for feeding and hygiene are in place for longer duration incidents.

- The ISO will communicate information about members who become ill or are injured on the scene, initiate an accident investigation as required by departmental SOPs, and request assistance from the HSO when needed.

- The ISO must prepare a written report for the Postincident Analysis (PIA) (referred to as an after-action report in ICS), that includes information about the incident from an occupational safety and health perspective.

- The ISO must monitor radio traffic to ensure that any communications barriers that could affect responder safety are addressed.

SAFETY INCIDENT ACTION PLAN

Being an effective risk manager requires a plan for monitoring conditions and actions at the incident. At large-scale or long-running incidents the safety plan is an integral part of a written IAP. Complex or large emergencies may also require more than one ISO to monitor the safety of responders. At most day-to-day incidents the "Safety IAP" is established and implemented through verbal communications.

As the incident risk manager, the ISO should properly document the safety aspects of the incident. Good documentation is important in the event of an injury or death of a responder, for use in after-action reporting, and it may become a part of the organization's records for the incident.

ICS provides two forms to assist the Safety Officer and Incident Command: 1) ICS Form 215A, *Incident Action Plan Safety Analysis*, and 2) ICS Form 202, *Incident Objectives*, which contains space for a Safety Message. ICS Form 215A guides a Safety Officer to look for areas where there may be hazards, identify and report the risk or hazard by area, and recommend mitigations, such as a change in strategies or tactics or the use of different personal protective equipment (PPE).

HEALTH AND SAFETY OFFICER IN FIRE DEPARTMENTS

ISOs depend on the safety groundwork established and maintained by the responding organizations. In the fire service, HSOs have been created to help establish and maintain the organization's compliance with NFPA 1500®.

A great deal of change has come about in the fire service. Vast improvements have been made in the advancement of firefighter safety and health. One of these changes has been the creation and development of the functions of an HSO. This position has evolved into a very demanding and responsible position for the person designated for this role.

According to NFPA 1500®, every fire department, regardless of size, must have an individual assigned to the duties of HSO. The HSO is appointed by the fire chief and reports directly to the fire chief or designee. NFPA also recommends that such a role become established in other emergency response organizations, such as in EMS.

The HSO is responsible for developing, coordinating, and managing the Occupational Safety and Health Program for the department.

National Fire Protection Association Definition of Health and Safety Officer

NFPA 1500® defines the HSO as the member of the fire department assigned and authorized by the fire chief as the manager of the safety and health program.

The HSO is a department-level, primarily administrative position, responsible for coordination of safety and wellness aspects as they apply to organizational activities.

The HSO guides departmental policy as it applies to occupational safety practices and member welfare. The HSO is responsible for interpretation of rules, regulations, and standards, and their application as they relate to organizational activities.

Although the majority of the HSO's activities are performed in a nonemergency setting, this work has a major impact on emergency operations. He/She also may act as an ISO and provide safety supervision on emergency scenes.

The HSO has a number of responsibilities. These duties are outlined in both NFPA 1521® and NFPA 1500®.

HEALTH AND SAFETY OFFICER/INCIDENT SAFETY OFFICER RELATIONSHIP

The duties of both the HSO and the ISO focus on responder safety. However, the work of the HSO generally is pre-emergency or nonemergency in nature, for the most part, and the work of the ISO is performed at the incident. If the HSO performs safety duties at the scene of an emergency, he/she is functioning as the ISO.

Because the HSO is a single individual, he/she cannot possibly be available to respond as the ISO to every emergency incident. If a department's HSO is unavailable to act as the ISO, the IC will appoint someone else to perform those functions. Some very large agencies may assign on-duty ISOs. In most situations, the IC assigns the ISO at the scene. An organization's HSO should ensure that other members of the agency are adequately trained to a level that would allow them to perform as an ISO. The qualifications for being appointed as an ISO should be clearly outlined in the department's SOPs.

Regardless how each position is filled, it is important they work together to improve safety. The ISO should inform the HSO of any unusual problems or situations encountered during an incident. Later, the HSO can consider the after-action reports in determining whether to modify SOPs or add new ones to enhance safety at an incident, including changes that will enhance responder safety in the future.

Should a responder be injured or killed at an incident, the ISO and the HSO will need to work together with other authorities to determine the circumstances surrounding the death or injury. They also must work together to determine the cause of any illness a responder may contract as a result of response.

The HSO will be the lead person in the development of many of the department's most important guides and SOPs that an ISO can employ: the department's Risk Management Plan, the organization's safety standards, the onscene risk assessment guides, the SOPs (both general and incident-type specific), mutual-aid safety protocols, and the records about the health and fitness of an organization's responders. An HSO should also be familiar with the community's emergency management plans and protocols and the laws, codes, and standards that apply. An ISO should look to the department's HSO as a key ally and adviser for accomplishing his/her incident-specific role. In the case of larger or more complex incidents, the ISO can also look to the HSOs of other responding organizations for assistance. There are many allies and leaders to draw upon to be successful.

SUMMARY

There are many critical components to the safety process for an EMS organization and fire department, involving both shared and individual responsibilities. An effective safety and health program for both emergency and nonemergency activities begins with the commitment of the department's chief. The leaders of other responding organizations will have the same commitment to safety. Fire chiefs appoint an HSO to manage the Occupational Safety and Health Program and to ensure compliance with laws, codes, and standards. These codes and standards provide the background needed for the ISO's important role at an incident.

Command Officers, Company Officers (COs), EMS personnel, firefighters, and all other responding individuals will, of course, be the key ingredient in the efforts to manage an incident successfully and safely. The ISO is enabled with a toolbox, the clarity and expectations of the ICS, and the recommendations of NFPA standards. This Command Staff position under NIMS reports directly to the IC, and is one of the most important roles at any incident. An ISO is directly responsible for the safety assessments, the development and execution of safe IAPs as an incident evolves, the ongoing monitoring of the strategies and tactics, and protection of the health and welfare of the responders.

There is much that a successful ISO must know about risk management, risk assessment, and the safe approaches to incidents of all types. The ISO has great allies and resources to draw upon to be successful, including the department's HSO and chief. The ISO will be one of the most rewarding roles a professional emergency manager will assume, and a key to a rewarding career in EMS, the fire service, and other response organizations.

The incident scene is the most hazardous area of operation. Through the use of an effective ICS, the incorporation of risk management, and the use of the HSO and ISO, public and responder fatalities and injuries can be reduced as Operations becomes both more effective and more efficient.

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Activity 4.1

Hazard Risk Analysis

Purpose

To write a Hazard Risk Analysis using ICS Form 215A for a particular type of incident.

Directions

1. Work in your assigned small groups. You will have 10 minutes to complete the activity.

2. View the photographs provided by the instructor and develop the main bullet points for filling out the form on an easel pad. A copy of this form can be found in Appendix D.

3. Prioritize the aspects of your plan and appoint a spokesperson for your group. Your spokesperson will present the five most significant aspects of your plan as identified by your group.

Overturned vehicle: _____

_____

_____

_____

_____

_____

Four-story building fire: _____

_____

_____

_____

_____

_____

Vacant structure fire:

Appliance store fire:

Crash on foggy highway:

House fire in snow:

Crash into pole:

Train derailment:

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NOTE-TAKING GUIDE

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UNIT 4:
SAFETY RESPONSIBILITIES

Slide 4-1

Slide 4-2

OBJECTIVES

The students will:

- **Describe how the roles of the Incident Commander (IC), Health and Safety Officer (HSO), and Incident Safety Officer (ISO) interrelate.**
- **Become familiar with the National Fire Protection Association (NFPA) 1500®, *Standard on Fire Department Occupational Safety and Health Program* and NFPA 1521®, *Standard for Fire Department Safety Officer* as they relate to the functions of the ISO.**
- **Using scenarios, write a Hazard Risk Analysis (using Incident Command System (ICS) Form 215A, *Incident Action Plan Safety Analysis*).**

Slide 4-2

Slide 4-3

INTRODUCTION

- **The ISO brings appropriate attention to all safety aspects of operations.**
- **The ISO reports to the IC.**
- **Responsibilities are laid out in the ICS and covered by NFPA.**
- **Risk Management Plans by responder organizations lay the groundwork for proper management of an incident.**

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Slide 4-4

INCIDENT COMMANDER

- **The IC is the ultimate Safety Officer for any incident or event.**
- **The ISO transmits information directly to the IC.**

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Slide 4-5

INCIDENT ACTION PLAN

- **The Incident Action Plan (IAP) defines objectives, strategies, tactical objectives, risk management, safety, and supporting requirements for an incident or event.**
- **The IAP is changed as often as circumstances change.**
- **The ISO must contribute to the IAP.**

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Slide 4-6

INCIDENT SAFETY OFFICER RESPONSIBILITIES

- **Ongoing assessment of hazardous environments (ICS Form 215A)**
- **Coordination of multiagency safety efforts**
- **Implementation of measures to promote emergency responder safety**
- **General safety of incident operations**

Slide 4-6

Slide 4-7

KEY INCIDENT SAFETY OFFICER FUNCTIONS PER NATIONAL FIRE PROTECTION ASSOCIATION 1521®

- **The authority to alter, suspend, or terminate unsafe acts or hazardous activities**
- **Must make commander aware of needs**
- **Monitors the scene and reports conditions and assessment to the IC**
- **Must be aware of traffic, hot zones, collapse zones, access, and egress**

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Slide 4-8

HAZARD RISK ANALYSIS

Effective risk management requires a plan for monitoring hazard conditions, establishing tactics, and measuring progress.

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Slide 4-9

HEALTH AND SAFETY OFFICERS IN FIRE DEPARTMENTS

- **HSOs produce the safety groundwork used by fire departments at events and incidents: safety standards, Standard Operating Procedures (SOPs), training, health, and fitness.**
- **Position created to help establish and maintain organization's compliance with NFPA 1500®.**

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Slide 4-10

KEY HEALTH AND SAFETY OFFICER'S FUNCTIONS

- **Development, implementation, and management of Risk Management Plan.**
- **Development, implementation, and management of occupational safety program.**
- **May become designated as an ISO.**

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Slide 4-11

HEALTH AND SAFETY OFFICER/ INCIDENT SAFETY OFFICER RELATIONSHIP

- **ISO duties are primarily on scene.**
- **An HSO's work generally is pre-emergency.**
- **Both focus on responder safety.**
- **Allies at scene and on investigations.**

Slide 4-11

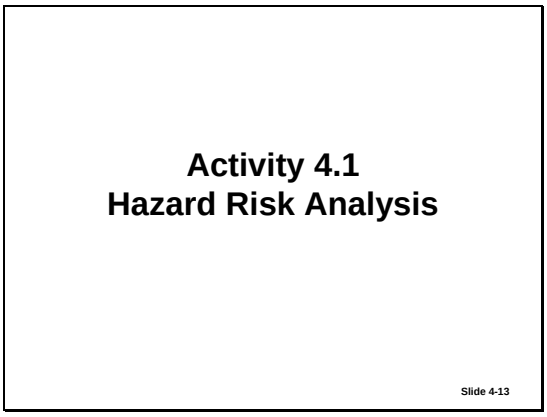
Slide 4-12

SUMMARY

- **An effective safety and health program for both emergency and nonemergency activities begins with the fire chief and the leaders of other agencies.**
- **Responders are the key ingredient. They should be committed to safety, applying standards, and following control measures.**
- **ISOs have a number of allies, like HSOs, to draw upon to do their jobs well.**
- **ISOs use risk assessments, draw on Risk Management Plans, and apply their knowledge about safety cues for different incident types.**

Slide 4-12

Slide 4-13



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UNIT 5: SAFETY AT SELECTED INCIDENT TYPES

OBJECTIVES

The students will:

1. *Describe the risks and safety approaches expected at wildland fire incidents.*
2. *Describe the risks and safety approaches expected at highway/traffic incidents.*
3. *Describe the safety concerns relating to incidents involving acts of violence.*
4. *Describe the importance of incident scene rehabilitation.*

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INTRODUCTION

This unit is intended to build the student's knowledge about a select number of operational areas or incident types where risks are confronted. The Incident Safety Officer's (ISO's) job is to bring appropriate attention to all the safety aspects of Operations and to the safety of response personnel at an incident. The more that you know about the risks, the more successful you will be as the ISO.

WILDLAND FIREFIGHTER SAFETY

Wildland and structural firefighters are finding themselves in dangerous role reversals more frequently. For example, wildland firefighters may be called on to protect threatened homes, and structural firefighters may be called on to help battle the surrounding blazes in the wildlands.

Characteristics of Wildland Fires

Wildland fires are different than structural fires. To understand some of the differences, students should read through the following excerpt from Doug Campbell's 2001 article, *Using Humidity or Solar Radiation to Predict Fire Behavior*:

> The humidity establishes the baseline fuel moisture content of fuels according to the time lag fuel moisture content of the forest fuel. Humidity readings and fuel moisture measurements are useful to determine the fire behavior potential when no other heating force is present in the fuel bed. Humidity readings used to determine the fuel moisture in 1 and 10 hour time lag fuels are most accurate at night, under cloud cover or under heavy canopy.
>
> Fuels exposed to solar heating are heated and dried beyond the humidity's influence. Forest fuel beds become highly variable in temperature and moisture content due to the variation of solar heating within the fuel bed. Available fuels heated by radiation do not follow the time lag formula of 1 and 10 hour fuels, but change within minutes not hours. The variation of fuel temperature is the cause of the variation in fuel flammability, during daytime hours.

Wildland Compared to Structural Firefighting

In addition to the obvious difference of size, wildland fires require more personnel and more resources spread out over a larger area. Wildland fires require long hours of arduous work in the worst of conditions. In the wildland fire environment, four basic safety hazards confront the firefighter: lightning, fire-weakened timber, rolling rocks, and entrapment by running fires.

Strategies, tactics, and operating procedures must be especially concerned about three, interrelated focal-points of safety:

1. The firefighters themselves.

2. The area immediately surrounding the firefighter.

3. The overall environment of the fire itself.

Tools and Personal Protective Equipment

Tools and personal protective equipment (PPE) are fundamentally different for structural and wildland firefighting. Firefighters in wildland situations normally are equipped in the following manner.

- Flame-resistant trousers and shirts do not absorb moisture, while allowing air to pass through and free movement.
- Hardhat is lightweight, impact-resistant, and well ventilated to protect against heat stress.
- Ventilated safety goggles with impact-resistant lenses minimize fogging.
- Cotton bandana is used for respiratory protection.
- Leather gloves are treated for thermal and flame resistance, and designed with minimal seams to prevent blisters when using tools.
- High-top, leather work boots worn with wool socks are lightweight enough to prevent fatigue over long periods of time.
- Field packs distribute weight along the hips and can be easily removed during emergencies.
- Wool jacket has natural fire-resistant properties and good air flow.
- Fire shelter is the last-chance lifesaver and used only when every possible means of escape is exhausted.

The PPE used for wildland firefighting does have limitations. Clothing does not provide thermal or steam protection. Self-contained breathing apparatus (SCBA) **are not used** in the wildland environment, leaving firefighters vulnerable to smoke inhalation and carbon monoxide poisoning. Prolonged burning times increase the risks from thermal inversions that will trap smoke and gases close to the ground resulting in increased risk of exposure.

10 Standard Fire Orders of the National Wildfire Coordinating Group

The "10 Standard Fire Orders" for wildland fires were developed in 1957 by a task force studying ways to prevent firefighter injuries and fatalities.

Shortly after the 10 Standard Fire Orders were incorporated into firefighter training, the "18 Watch Out Situations" were developed. These 18 situations are more specific and cautionary than the 10 Standard Fire Orders. If firefighters follow the 10 Standard Fire Orders and are alerted to the 18 Watch Out Situations, much of the risk of wildland firefighting can be reduced. Students should take note of the differences and the similarities of wildland firefighting to structural firefighting illustrated on the following page in Table 5-1.

Table 5-1
Comparison of the 10 Standard Fire Orders and the 18 Watch Out Situations

10 STANDARD FIRE ORDERS

The NWCG parent group approved a revision of the 10 Standard Fire Orders. These orders are to be applied to all wildland fire situations.

Fire Behavior

1. Keep informed on fire weather conditions and forecasts.
2. Know what your fire is doing at all times.
3. Base all actions on current and expected behavior of the fire.

Fireline Safety

4. Identify escape routes and make them known.
5. Post lookouts when there is possible danger.
6. Be alert. Keep calm. Think clearly. Act decisively.

Organizational Control

7. Maintain prompt communications with your forces, your supervisor, and adjoining forces.
8. Give clear instructions and ensure they are understood.
9. Maintain control of your forces at all times.

If 1 through 9 are considered, then include:

10. Fight fire aggressively, having provided for safety first.

The 10 Standard Fire Orders are firm. We don't break them; we don't bend them. All firefighters have a right to a safe assignment.

18 WATCH OUT SITUATIONS

1. Fire not scouted and sized up.
2. In country not seen in daylight.
3. Safety zones and escape routes not identified.
4. Unfamiliar with weather and local factors influencing fire behavior.
5. Uninformed on strategy, tactics, and hazards.
6. Instructions and assignments not clear.
7. No communication link with crewmembers and supervisor.
8. Constructing line without safe anchor point.
9. Building fireline downhill with fire below.
10. Attempting frontal assault on fire.
11. Unburned fuel between you and fire.
12. Cannot see main fire, not in contact with someone who can.
13. On a hillside where rolling material can ignite fuel below.
14. Weather becoming hotter and drier.
15. Wind increases and/or changes direction.
16. Getting frequent spot fires across line.
17. Terrain and fuels make escape to safety zones difficult.
18. Taking nap near fireline.

LOOKOUTS, COMMUNICATIONS, ESCAPE ROUTES, SAFETY ZONES

The lookouts, communications, escape routes, safety zones (LCES) system approach to fireline safety is an outgrowth of an analysis of fatalities and near misses for over 20 years of active fireline suppression duties. LCES simply focuses on the essential elements of the 10 Standard Fire Orders. Its use should be automatic in fireline Operations, and all firefighters should know the LCES interconnection.

LCES is part of the 10 Standard Fire Orders for wildland firefighting.

Each firefighter must know the interconnection of LCES. LCES should be established before fighting the fire and continuously maintained: select lookouts, set up communications, choose escape routes, and select safety zones.

LCES functions sequentially--it's a self-triggering mechanism. Lookouts assess, and continue to assess the fire environment and communicate threats to safety; firefighters are to recognize and then use escape routes to safety zones. All firefighters should be alert to changes in the fire environment and have the authority to initiate communication.

LCES is built on two basic guidelines:

1. **Before** safety is threatened, each firefighter must know how the LCES system will be used.

2. LCES must be reevaluated continuously because fire conditions change.

Figure 5-1 on the following page includes a useful checklist regarding LCES.

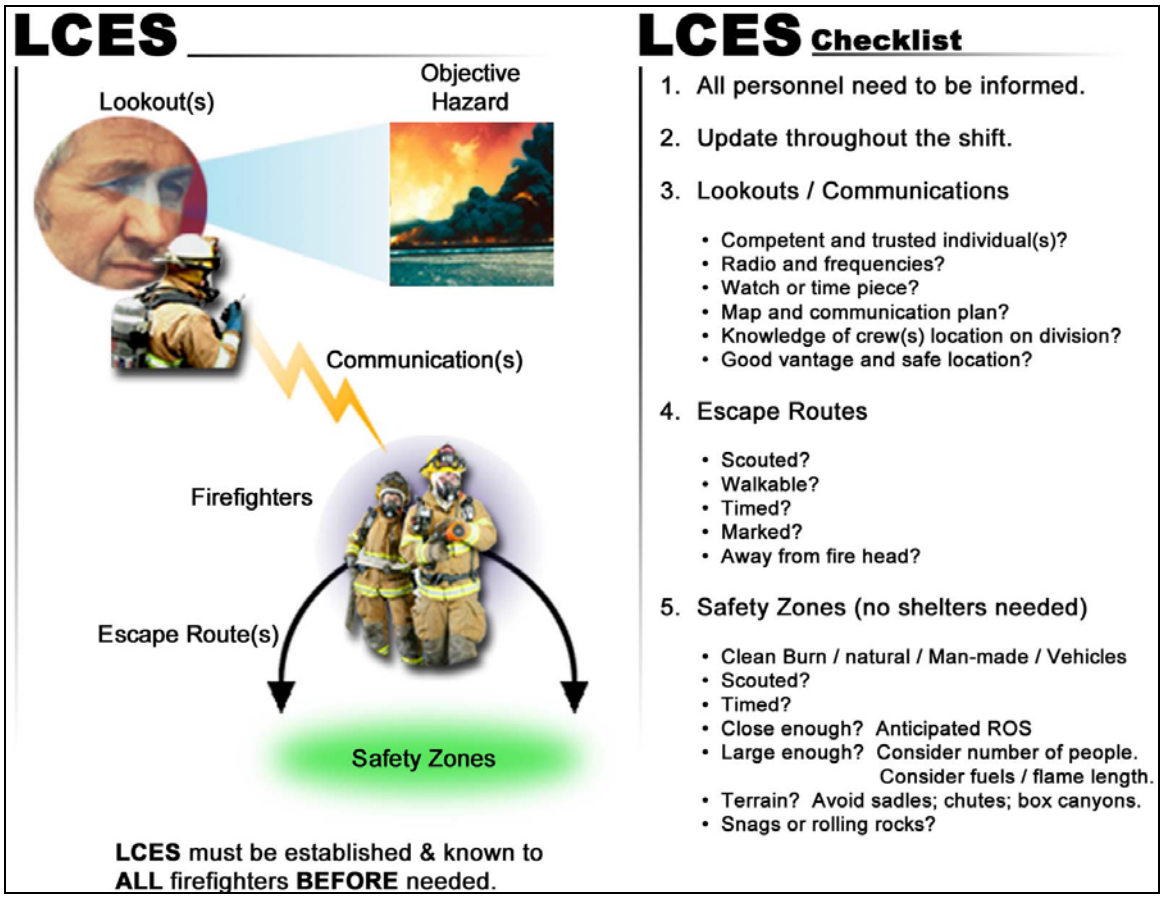

Figure 5-1
LCES Checklist

HIGHWAY OPERATIONS

The priorities for any operation at the scene of a highway incident are to:

- preserve life;
- stabilize the incident; and
- protect property and the environment.

Once these priorities are addressed, emergency responders can take actions to restore traffic flow. Restoring the roadway to normal, or near normal, creates a safer environment for motorists and emergency responders. It also improves the public's perception of the agencies involved and reduces the time and dollar loss resulting from the incident.

According to the National Fire Protection Association (NFPA, 2000), from 1995 through 1999, 17 firefighters were struck and killed by motorists. This was an 89 percent increase in the number of line-of-duty deaths (LODDs) from this cause compared to the previous 5-year period.

In 2006, there were an estimated 16,020 collisions involving fire department emergency vehicles while responding to or returning from incidents. In 2007, 27 firefighters died in vehicle crashes. According to the U.S. Fire Administration (USFA), approximately 25 percent of firefighters who are killed in the line of duty are responding to or returning from incidents, and the majority of the fatalities are a result of vehicle crashes. This represents the second leading cause of firefighter fatalities.

A vehicle accident is the most common emergency response and the one that often carries the greatest risk to personnel. Operations should, of course, be conducted in a way that minimizes the risk to the emergency responders. With risks avoided or under control, responders can accomplish objectives and perform their tasks more quickly and effectively.

Team Effort

Managing a highway incident and other related problems is a team effort. Each responding agency and Unit has a role to play in an effective incident operation. Law enforcement, the Department of Transportation (DOT), and the fire and rescue department all play important roles in the management of highway incidents. It is not a question of "who is in charge?" but "**who is in charge of what**?" Care of the injured, protection of the public, safety of the emergency responders, and clearing the traffic lanes should all be priority concerns of the Incident Commander (IC).

Command

It is imperative that Command be established early into any highway operation. The IC is the overall Safety Officer responsible for ensuring safe working conditions. Operational objectives and strategies must be determined. This helps in identifying required resources to mitigate any hazard. For example, if a hazardous material is involved, it is important to determine what additional resources would be required for an evacuation.

As in any other operation, accountability of personnel is mandatory. However, in an incident where multiple agencies have personnel and resources at the incident scene, accountability is even more difficult. An Accountability Group may be established with representatives from multiple agencies assisting in this task.

The management of an incident involving multiple agencies is difficult. Determining who is in charge of what and when is always a situation that may lead to disagreement. Identifying each responding agency and its particular role and responsibility can help to avoid a power struggle once an incident occurs. To avoid such a struggle, preincident agreements should be established with law enforcement, the DOT, and emergency medical services (EMS) agencies. The agreements should identify each agency's roles and responsibilities so that when an incident occurs, these will be already spelled out and agreed upon. In addition, mutual-aid agreements should be established that identify specific responses to deliver appropriate equipment and staffing to the incident. Under the Incident Command System (ICS), a Unified Command may

be established in the case of the more complex incidents. The ISO would be part of the Command Staff under a Unified Command approach.

Roles and Responsibilities

Each responding agency has specific roles and responsibilities at a highway scene. These are delineated here for the various agencies.

Fire Department

- control and extinguish fires;
- establish safe work zones;
- deploy warning devices to give motorists early notification and reaction time;
- control and mitigate any hazardous materials;
- coordinate with law enforcement the control of traffic;
- assist EMS in the treatment and removal of patients;
- extricate trapped victims; and
- preserve the scene for investigation teams.

Emergency Medical Services

- patient triage and assessment;
- patient treatment;
- responder medical services, if needed; and
- transportation.

Law Enforcement

- coordinate with fire department to establish traffic control;
- secure the scene; and
- assist in the identification of any fatalities.

Department of Transportation

- coordinate with fire department for the use of heavy equipment for extrication or removal;
- provide resources and logistical support;
- establish variable message safety boards for motorists; and
- assist with traffic control by the use of movable barriers or vehicles.

Vehicle Recovery Personnel

- coordinate with fire department and law enforcement for the removal of vehicles; and
- assist with heavy extrication and removal.

Responding to the Incident

The officer or supervisor for the responding vehicle should be responsible for the safety of the crew from the time the apparatus leaves until it returns. Safety of the crew is foremost in both emergency and nonemergency situations. Personnel must make every effort to minimize the risk of injury to themselves and those who use the highway system. Personnel will wear appropriate gear and be seated with seatbelt on prior to their vehicle responding to all incidents. Organizations should have Standard Operating Procedures (SOPs) to cover all aspects of the response.

The USFA publishes guides and research initiatives including

- *Alive on Arrival*;
- *Emergency Vehicle Safety Initiative*;
- *Effects of Warning Lamp Color and Intensity on Driver Vision*;
- *Traffic Incident Management Systems*; and
- *Emergency Vehicle Visibility and Conspicuity Study*.

These and other reports can be downloaded from the USFA's publications at (http://www.usfa.dhs.gov).

Other available documents include:

- *Guide to Model Policies and Procedures for Emergency Vehicle Safety*:
  - Cooperative publication from USFA and the International Association of Fire Chiefs (IAFC), and
  - Available at http://www.iafc.org/vehiclesafety);
- *Improving Apparatus Response and Roadway Operations Safety in the Career Fire Service*:
  - Cooperative publication from USFA and the International Association of Fire Fighters (IAFF), and
  - Available at (http://www.iaff.org/hs/EVSP/index.html); and
- *Emergency Vehicle Safe Operations for Volunteer & Small Combination Emergency Service Organizations*:
  - Cooperative publication from USFA and the National Volunteer Fire Council (NVFC), and
  - Available at (http://www.nvfc.org/page/988/Emergency_Vehicle_Safe_Operations.htm).

When units respond to nonemergency situations, all traffic laws governing normal driving practices should be followed. Response apparatus should follow the driving speed as dictated in your SOP.

The left travel lane is the preferable lane of response. When the shoulder must be used, apparatus operators must use extreme caution. Be aware of:

- road signs;
- debris;
- guardrails; and
- oversized and stopped vehicles.

Response via one-way traffic lanes and access ramps should be in the normal direction of travel, unless an officer on the scene can confirm that oncoming traffic has been stopped and no other vehicles will be encountered.

Under no circumstances should crossovers be used for routine changes in travel direction. Large median strip crossovers marked "**Authorized Vehicles Only**" should be used only when apparatus can complete the turn without obstructing the flow of traffic in either travel direction, or when all vehicular traffic has come to a complete stop.

Onscene Actions

In accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD), published by the Federal Highway Administration (FHWA)/DOT, most Temporary Traffic Control (TTC)/incident zones are divided into four areas (Figure 5-2). The **advanced warning area** is the section of highway where drivers are informed of the upcoming incident area. Because drivers on freeways are assuming uninterrupted traffic flow, the advance warning sign should be placed further back from the incident scene than on two-lane roads or urban streets. Table 5-2 (SM p. 5-16) shows the stopping sight distance as a function of speed.

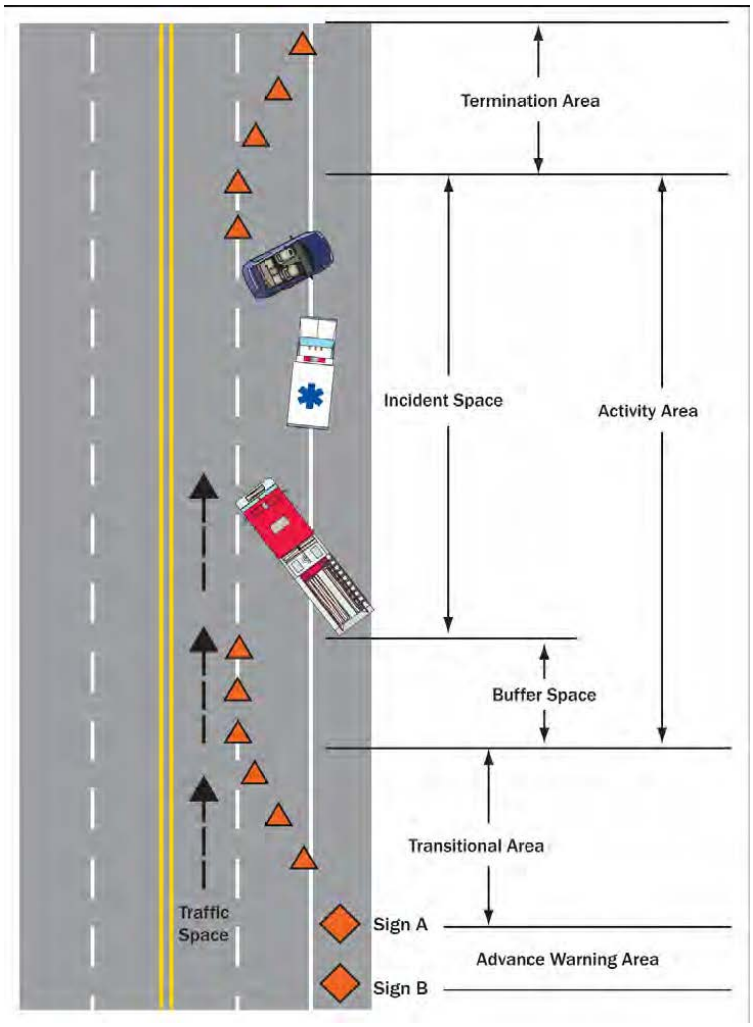

Figure 5-2
Temporary Traffic Control/Incident Zones

The **transitional area** is the section of the TTC zone where drivers are redirected from their normal path. This usually involves the creation of tapers using channelizing devices. Tapers may be used in both the transition and termination areas. The MUTCD designates the distance of cone placement to form the tapers based on the speed limit multiplied by the width of the lanes being closed off.

The **activity area** is the section of highway where the work activity or incident takes place. It is made up of the incident space, the traffic space, and the buffer space. The incident space is where the actual work activity occurs. The traffic space is the portion of the roadway used to route traffic through the incident area. The buffer space is the lateral and/or longitudinal area that separates traffic flow from the work area. The buffer space may provide some recovery space for an errant vehicle. The MUTCD (Section 6C.06) specifically states that "an incident response and emergency-vehicle storage area should not extend into any portion of the buffer space."

The **termination area** is used to return drivers to their normal path. It ends at the last TTC device. Conditions and safety considerations may dictate the need for a longitudinal buffer space between the work area and the start of the downstream taper.

See the USFA publication *Traffic Incident Management Systems* for more information on establishing TTCs.

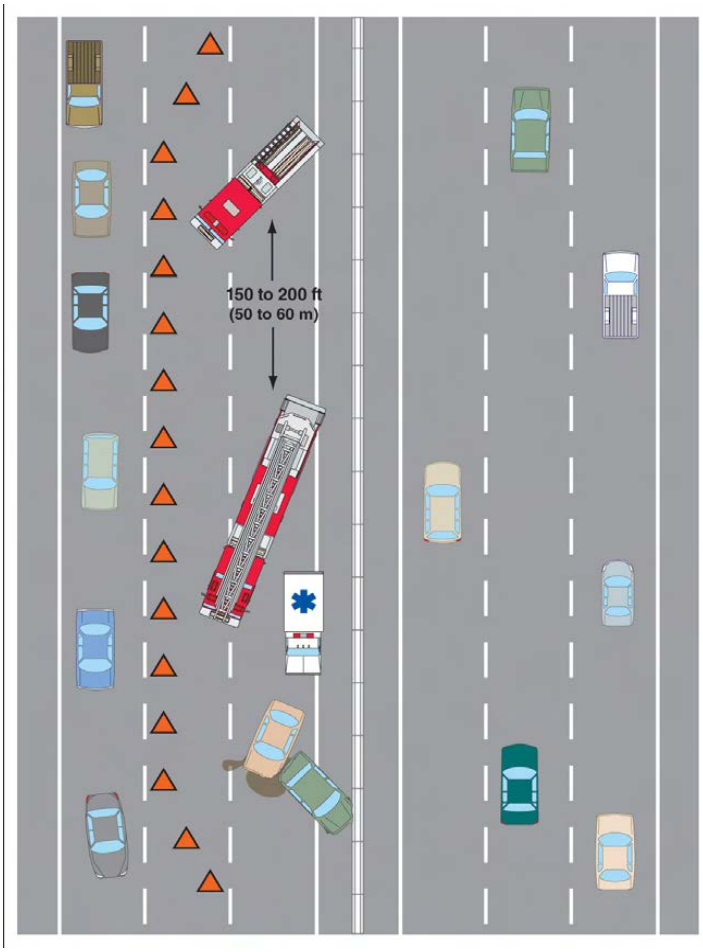

Figure 5-3
Vehicle Placement

Vehicle Placement

Effective and safe management of a roadway incident scene begins with the arrival and positioning of the first apparatus**.** From the very outset of the incident it should be the goal of all responders to protect the incident work area and those who will be operating within this area**.** According to *Improving Apparatus Response and Roadway Operations Safety in the Career Fire Service*, developed by the IAFF in conjunction with the USFA, the driver/operator has three primary concerns when determining where to park the apparatus on a roadway emergency scene:

1. Park the apparatus in a manner that reduces the chance of the vehicle being struck by oncoming traffic.

2. Park the apparatus in a manner that shields responders and the operational work area from being exposed to oncoming traffic (Figure 5-3).

3. Park the apparatus in a location that allows for effective deployment of equipment and resources to handle the incident.

The procedures for performing each of these options will differ depending on the type of incident, the type of road, and the surroundings of the emergency scene. Drivers must be versed in the appropriate positioning procedures for all of the possible environments within which they may be expected to operate.

Prior to exiting an emergency response vehicle, personnel must:

- check to ensure that traffic has stopped to avoid the possibility of being struck by a passing vehicle;
- communicate with all personnel via any onboard communications system that traffic has come to a stop and it is safe to exit;
- look down on the incident grounds to ensure that debris will not become an obstacle, resulting in a personal injury; and
- wear full-protective clothing and traffic vests as the situation indicates. (Refer to American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) 107 and 207, most recent edition, for specific requirements of high-visibility safety apparel.)

The speed of traffic must be considered when establishing a safe work area. Use Table 5-2 below to determine how far to place the first cone or flare away from the incident scene.

Table 5-2
Stopping Sight Distance as a Function of Speed

Speed (mph)	Distance (ft.)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

Weather should be taken into consideration when setting up the work zones. Rain and fog decrease motorist visibility and wet road surfaces increase the risk of secondary collisions.

Apparatus Visibility at Night

Two critical issues related to night visibility are color recognition and glare recovery by the oncoming motorists. Because most emergency vehicle warning lights are red, it is important to remember that as the human eye adapts to the dark the first color to leave the spectrum is red. Red tends to blend into the nighttime surroundings. Newer vehicles now have a combination of red and blue strobes.

Vision recovery from the effects of glare depends on the prevailing light conditions. Vision recovery from dark to light takes 3 seconds; from light to dark takes at least 6 seconds. A vehicle traveling at 50 mph covers approximately 75 feet per second or 450 feet in the 6 seconds before the driver fully regains night vision. Headlights on the apparatus that shine directly into oncoming traffic can result in drivers literally passing the incident scene blinded.

To reduce the potential negative effects as a result of glare, headlights and fog lights should be shut off at night scenes. Floodlights should be raised to a height that allows light to be directed down on the scene. This can reduce trip hazard by reducing shadows and the chance of blinding oncoming drivers. Many highway safety specialists believe that the rear lights on emergency vehicles parked at a roadway scene should be amber. Many fire departments have moved toward the use of all amber warning lights when parked on the roadway during nighttime operations. In

some cases the vehicles are equipped with interlocks that automatically shut off all nonamber warning lights when the parking brake is set.

Section 6I.05 of the MUTCD addresses the use of warning lights as follows:

> The use of emergency lighting is essential, especially in the initial stages of a traffic incident. However, it only provides warning; it does not provide effective traffic control. Emergency lighting is often confusing to drivers, especially at night. Drivers approaching the incident from the opposite direction on a divided roadway are often distracted by the lights and slow their response resulting in a hazard to themselves and others traveling in their direction. (It also often results in traffic congestion in the unaffected opposite lane[s] and increases the chance of a secondary collision.)

Clearing Traffic Lanes

Reducing and/or shutting down traffic lanes creates other problems and safety concerns. Closing traffic lanes or keeping lanes closed unnecessarily disrupts traffic throughout the area, can affect businesses in the region significantly, and greatly increases the risk of a secondary incident resulting from traffic backup. One minute of stopped traffic causes an additional 4-minute traffic delay. Therefore, apparatus should be repositioned to allow traffic to flow on as many lanes as possible as soon as the operational phases (extrication, medical care, and suppression) are completed. The officer-in-charge should open closed lanes and place Units in service as soon as practical. However, do not move vehicle parts or "nonessential" items that would later hamper a police investigation.

Policies, Procedures, and Guidelines

Each department's Health and Safety Officer (HSO) should develop policies, procedures, and guidelines considering standards and recommendations of other area response agencies, DOT, and national organizations.

ACTS OF VIOLENCE AND TERRORISM

Response organizations are more aware now that acts of violence can occur at any incident. Terrorism is something that needs to be considered in all the operating procedures the department adopts.

Terrorism Defined

Terrorism is defined as the use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof to further political or social objectives.

In recent years we have seen attacks against the government and civilians from both foreign and domestic groups. Here is the list:

- Oregon--biological agent dispersed in salad bars;
- Atlanta, Georgia--Olympic Plaza bombing;
- Sandy Spring, Georgia--abortion clinic bombing;
- Vail, Colorado--ski resort, incendiary (arson);
- Fairfax, Virginia--Central Intelligence Agency (CIA) armed attack;
- New York City--first World Trade Center (WTC) bombing (1993);
- Oklahoma City, Oklahoma--Federal building bombing;
- New York City; Arlington, Virginia; Shanksville, Pennsylvania--9/11 attacks using hijacked airplanes;
- Boca Raton, Florida--anthrax attacks; and
- New York City and Washington, DC--anthrax attacks via mail.

Fire and EMS departments need to be aware that risks and vulnerabilities cannot be viewed just in terms of isolated incidents. We also know that responders can be targets at terrorist events and there is the potential for a carefully timed sequence of additional acts planned to inflict further harm to those who respond. These additional acts can include

- armed resistance;
- use of weapons;
- booby traps; and
- more incidents, of varying types.

Categories of Terrorist Incidents

Chemical Incidents

Chemical agents fall into five classes:

1. Nerve agents.

2. Blister agents.

3. Blood agents.

4. Choking agents.

5. Irritating agents.

The primary routes of exposure to chemical agents are inhalation, ingestion, and skin absorption.

Biological Incidents

Biological agents include anthrax, tularemia, cholera, plague, botulism, and smallpox. Exposure to these agents can occur in a variety of ways: inhalation (aerosol spray or fine powder), ingestion (food or water contamination), direct skin contact, or injection.

Incendiary Incidents

An incendiary device is any mechanical, electrical, or chemical device used to initiate combustion and start a fire intentionally. Incendiary devices may be simple or complex, and come in all shapes and sizes. The type of device is limited only by the terrorist's imagination and ingenuity. Only specially trained personnel should handle incendiary devices discovered prior to ignition.

Nuclear/Radiation Incidents

There are two threats in the area of nuclear incidents. The first is the threatened detonation of a nuclear bomb. The second is the threatened or actual detonation of a conventional explosive incorporating radioactive material. Although the potential for a terrorist organization having access to nuclear explosives was thought to be almost impossible, with the recent changes in terrorist events, we must never be complacent.

Explosive Incidents

It is estimated that 70 percent of worldwide terrorist attacks involve explosives. Bombings are the most likely terrorist attack encountered. Explosions rapidly release gas and heat, affecting both people and structures. Bombs almost always work as designed. It is important to remember that explosions can cause fires, and fires can cause explosions. Firefighters always must be aware of the potential for secondary devices.

Potential Responder Injuries

There are many possibilities for injuries to emergency personnel responding to acts of violence and terrorism. These include

- improvised explosive devices;
- secondary explosive devices;
- firearms;
- exposure to chemicals;
- trapped in building collapse;
- exposure to biological agents;
- exposure to infectious diseases;

- burns from incendiary fire;
- injuries due to damaged building; and
- overexertion.

Key Areas for Protecting Responders

There are no easy answers to protecting responders from these threats, but self-protection is built on the three key areas used for hazardous materials (hazmat) incidents: time, distance, and shielding.

Time

You should spend the shortest amount of time possible in the hazard area. Use techniques such as rapid entries to conduct reconnaissance and rescue. Minimizing time spent in the affected area also reduces the chance of contaminating the crime scene.

Distance

It should be an absolute rule to maintain a safe distance from the hazard area or projected hazard area. If at all possible, be upwind and uphill from the source. An excellent resource for determining safe distances is the Table of Initial Isolation and Protective Action Distances found in the *North American Emergency Response Guide*, commonly known as the "NAERG." This book typically is carried on all emergency response vehicles. Additional copies may be available through local and State emergency management agencies.

Shielding

This can take various forms such as vehicles, buildings, walls, and PPE. However, no matter how much shielding is available, always take full advantage of time and distance.

U.S. Fire Administration Job Aid on Terrorism

The USFA publishes the *Emergency Response to Terrorism: Job Aid*, which is designed to assist the first responder from fire, EMS, hazmat, and/or law enforcement in identifying a potential incident involving terrorists/weapons of mass destruction (WMD) and implementing initial actions. This document is not a training manual but a "memory jogger" for those who have completed the appropriate level of training. This publication is available to emergency response organizations only. It can be downloaded at http://www.usfa.fema.gov from USFA Publications.

Safety Operations Team

Safety for terrorism incidents and where there are acts of violence require a team approach. Consideration of the risks of incident actions must be weighed against the benefits of those actions. The team should consist of the ISO, law enforcement, technical advisors, Assistant Safety Officers, and special operational personnel (government and private). The Safety Operations Team also must communicate closely with Operations (to evaluate and establish operational zones) and EMS (to review exposure symptoms and treatment protocols). Other responsibilities of the team include

- review, update, and communicate escape routes regularly;
- establish access-control rules of engagement and regularly update them to match the situations;
- provide relief/rotation for Safety Officers;
- establish exposure and documentation procedures;
- notify medical facilities of the situation and the status of patients;
- monitor weather and its impact on operations;
- monitor time on scene and during tactical operations;
- continuously review Rapid Intervention Crew (RIC) operations,
- continuously review Staging locations and procedures;
- continuously review the communications with, the staffing for, and the location of law enforcement;
- continuously review scene security; and
- provide rehabilitation areas.

INCIDENT SCENE REHABILITATION

When responding to an incident and conducting operations, one of the most important set of safety control measures deals with the responders themselves. For example, wildland fire incidents include long and arduous physical labor. Structural firefighting has the same concerns whenever the incident is of a long duration. Responder safety concerns also arise from weather, which affects all incidents.

No matter what the event or incident, responders need to have a process set up so they can move out of the operational line and receive rehabilitation (often so they can return to incident operations). Exhausted, injured, exposed, cold, or overheated responders are at personal risk and can jeopardize the success of incident management.

The department should maintain SOPs or Standard Operating Guidelines (SOGs) that outline a systematic approach for the rehabilitation of personnel operating at incidents. These procedures should cover: medical evaluation and treatment, food and fluid replenishment, crew rotation, and relief from extreme climatic conditions. They should outline ongoing rehabilitation for simple or short-duration incidents, and long-duration incidents. Procedures should also outline rehabilitation for situations when it is necessary to transition into the rehabilitation needs of a large or long-duration incident.

Medical evaluation and treatment in the onscene rehabilitation area should be conducted according to EMS protocols. If advanced life support (ALS) personnel are available, this level of EMS care is preferred. The IC should consider the circumstances of each incident and initiate rest and rehabilitation of personnel. Guidance can be found in Chapter 8 of NFPA 1500®, *Standard on Fire Department Occupational Safety and Health Program,* NFPA 1584®, *Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises*, and the USFA report *Emergency Incident Rehabilitation*.

Weather and Rehabilitation

Weather factors during emergency incidents can have a severe impact on the safety and health of the personnel. Humidity and wind have significant effects. Table 5-3 shows the frostbite times, Table 5-4 shows heat index chart, and Table 5-5 shows the temperature danger categories. When these factors combine with long-duration incidents or situations that require heavy exertion, the risks to responders increase rapidly. The department should develop procedures, in consultation with the department physician, to provide relief from adverse climatic conditions.

Typical rehabilitation considerations for operations during hot weather extremes include

- moving fatigued or unassigned responders away from the hazardous area of the incident;
- removal of PPE;
- ensuring that personnel are out of direct sunlight;
- ensuring that there is adequate air movement over personnel, either naturally or mechanically;
- providing personnel with fluid replenishment, especially water; and
- providing medical evaluation for personnel showing signs or symptoms of heat exhaustion or heat stroke.

Typical rehabilitation considerations for operations during cold weather extremes should include

- moving fatigued or unassigned personnel away from the hazardous area of the incident;
- providing shelter from wind and temperature extremes;
- providing personnel with fluid replenishment, especially water; and
- providing medical evaluation for any person showing signs or symptoms of frostbite, hypothermia, or other cold-related injury.

Emergency Medical Care

Departments should provide incident-scene rehabilitation during emergency operations, with guidance from NFPA 1521®, *Standard for Fire Department Safety Officer*, NFPA 1584®, and USFA *Emergency Incident Rehabilitation*.

Under the NFPA standard, the minimum level of emergency medical care available shall be at least basic life support (BLS) care. The assignment of an ambulance or other support crew to the

rehabilitation function is essential during long-duration or heavy-exertion incident operations. This crew can assist with rehabilitation functions as well as be available to provide immediate BLS needs for personnel. An ALS level of care is preferred for long-duration events and should at the least be available quickly to ensure the proper level of care.

The rehabilitation area should be established in a safe environment away from the hazardous area of the incident.

Table 5-3
Wind Chill Temperatures--National Weather Service (2001)

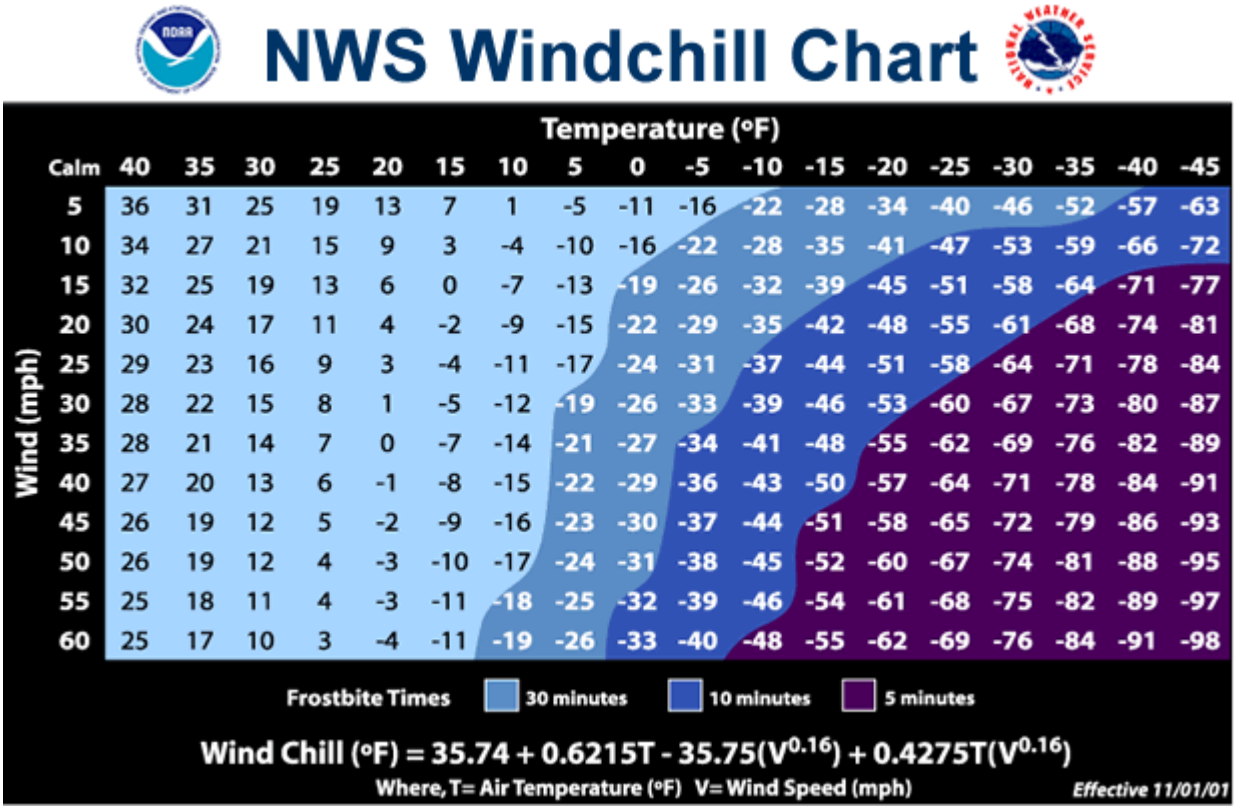

Table 5-4
Heat Index Chart

Heat Stress Index

	Relative Humidity								
Temp °F	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
104	98	104	110	120	132				
102	97	101	108	117	125				
100	95	99	105	110	120	132			
98	93	97	101	106	110	125			
96	91	95	98	104	108	120	128		
94	89	93	95	100	105	111	122		
92	87	90	92	96	100	106	115	122	
90	85	88	90	92	96	100	106	114	122
88	82	86	87	89	93	95	100	106	115
86	80	84	85	87	90	92	96	100	109
82	77	79	80	81	84	86	89	91	95
80	75	77	78	79	81	83	85	86	89
78	72	75	77	78	79	80	81	83	85
76	70	72	75	76	77	77	77	78	79
74	68	70	73	74	75	75	75	76	77

Note: Add 10° when protective clothing is worn and add 10° when in direct sunlight.

Table 5-5
Temperature Danger Categories

Temperature °F	Danger Category	Injury Threat
Below 60°	None	Little or no danger under normal circumstances.
80° to 90°	Caution	Fatigue possible if exposure is prolonged and there is physical activity.
90° to 105°	Extreme Caution	Heat cramps and heat exhaustion possible if exposure is prolonged and there is physical activity.
105° to 130°	Danger	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
Above 130°	Extreme Danger	Heat stroke imminent!

SUMMARY

Responders face many hazards and risks. In order to fulfill their functions, ISOs need knowledge regarding the risks and safety approaches for a range of incidents, including wildland fires, highway traffic incidents, and acts of violence. In this unit, safety areas of concern were highlighted for each of these selected types of incidents. Rehabilitation of response personnel is another important area of concern for ISOs.

Activity 5.1

Safety at Other Incidents

Purpose

To give you an opportunity to apply the lessons to incidents and scenarios of interest to you and to increase your participation using a discussion format.

Directions

1. Take 5 minutes to write down a description of an incident scenario that you would like to review. Be prepared to explain the scenario you chose.

2. The instructors will collect the pieces of paper and select three scenarios to address.

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NOTE-TAKING GUIDE

Slide 5-1

UNIT 5:
SAFETY AT SELECTED INCIDENT TYPES

Slide 5-1

Slide 5-2

OBJECTIVES

The students will:
- **Describe the risks and safety approaches expected at wildland fire incidents.**
- **Describe the risks and safety approaches expected at highway/traffic incidents.**
- **Describe the safety concerns relating to incidents involving acts of violence.**
- **Describe the importance of incident scene rehabilitation.**

Slide 5-2

Slide 5-3

WILDLAND FIREFIGHTER SAFETY

Wildland fires--they're different
- **Humidity affects fuel moisture content**
- **Forest fuel beds affected by solar heating**
- **Forest fuel's potential varies by the minute**

Slide 5-3

Slide 5-4

VIDEO:

"Firefighter Safety in the Wildland/Urban Interface"

Slide 5-4

Slide 5-5

WILDLAND VERSUS STRUCTURAL

- **Wildland requires more personnel and resources.**
- **Wildland spreads over larger area.**
- **Wildland personnel face such safety hazards as lightning, weakened timber, rolling rocks, etc.**

Slide 5-5

Slide 5-6

10 STANDARD FIRE ORDERS

- **Three on fire behavior**
- **Three on fireline safety**
- **Four on organizational control**
- **"18 Watch Out Situations"**

Slide 5-6

Slide 5-7

L.C.E.S FOR WILDLAND FIRE

- **Lookouts**
- **Communications**
- **Escape routes**
- **Safety zones**

Slide 5-7

Slide 5-8

HIGHWAY OPERATIONS AND PRIORITIES

Accident on the State Highway System

- **Safety**
- **Environmental concerns**
- **Legal and policy**

Slide 5-8

Slide 5-9

TEAM APPROACH-- FIRE DEPARTMENT

- **Control and extinguish fires**
- **Mitigate hazardous materials (hazmat)**
- **Extricate trapped victims**
- **Preserve scene for investigations**

Slide 5-9

Slide 5-10

TEAM APPROACH--EMERGENCY MEDICAL SERVICES

- **Patient triage and assessment**
- **Patient treatment**
- **Responder medical services**
- **Transportation of patients**

Slide 5-10

Slide 5-11

TEAM APPROACH--DEPARTMENT OF TRANSPORTATION

- **Coordinate with fire department for the use of heavy equipment for extrication or removal**
- **Provide resources and logistical support**
- **Establish variable message safety boards for motorists**
- **Assist with traffic control by the use of movable barriers or vehicles**

Slide 5-11

Slide 5-12

TEAM APPROACH--LAW ENFORCEMENT

- **Coordinate with the fire department to establish traffic control**
- **Secure the scene**
- **Assist in identification of any fatalities**
- **Assist with investigations**

Slide 5-12

Slide 5-13

Everybody Buckle Up Every Time

Slide 5-13

Slide 5-14

VIDEO:

"Highway Safety for Emergency Services"

Slide 5-14

Slide 5-15

ONSCENE ACTIONS

- **Incident zones--** ***Manual on Uniform Traffic Control Devices*** **(MUTCD)**
- **Vehicle placement**

- **Protective and reflective clothing**
- **Apparatus visibility at night**

Slide 5-15

Slide 5-16

ACTS OF VIOLENCE AND TERRORISM

Terrorism: The use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof to further political or social objectives.

Slide 5-16

Slide 5-17

TERRORIST ATTACKS

- **Oregon--chemical agent**
- **Georgia--Olympic Plaza and abortion clinic**
- **Oklahoma City**
- **Boca Raton--anthrax**
- **New York City and Washington, DC**

Slide 5-17

Slide 5-18

TERROR ATTACK TYPES

- **Chemical**
- **Biological**
- **Incendiary**
- **Nuclear/Radiation**
- **Explosive**

Slide 5-18

Slide 5-19

PROTECTING RESPONDERS

- **Time--spend as little time as possible in hot zone**
- **Distance--know the *North American Emergency Response Guide* (NAERG)**
- **Shielding--vehicles, buildings, walls, and personal protective equipment (PPE)**

Slide 5-19

Slide 5-20

SAFETY IS A TEAM APPROACH

- **Communicate escape routes regularly**
- **Establish and update access controls**
- **Monitor time on scene and provide relief/rotation and rehabilitation**
- **Monitor weather and its impacts**
- **Continuously review staging and procedures**
- **Continuously review scene security**
- **Continuously review radio communications**

Slide 5-20

Slide 5-21

REHABILITATION

- **Responders need a respite from exhaustion, exposure to heat or cold, and mental strain.**
- **This is a safety control measure.**

Slide 5-21

Slide 5-22

REHABILITATION OPERATIONS

- **No matter what the incident, responders need to have a process established to move them out of the operational line and receive rehabilitation.**
- **Procedures or guides outline a systematic approach for rehabilitation.**
- **Procedures to cover medical evaluations and treatment, food, fluid, crew rotation, relief from extreme climatic conditions, and rest.**

Slide 5-22

Slide 5-23

WEATHER FACTORS

- **Can have a severe impact on the safety and health of responders**
- **Wind chill**
- **Heat index chart**
- **Temperature danger categories**

Slide 5-23

Slide 5-24

EMERGENCY MEDICAL SERVICES FOR REHABILITATION PURPOSES

- **Incident Commander (IC) should establish minimum level of emergency medical support on scene.**
- **Responder Medical Plan is reviewed by the Incident Safety Officer (ISO).**

Slide 5-24

Slide 5-25

SUMMARY

- **Responders face many hazards and risks, and ISOs need to know some of the safety cues for these.**
- **Rehabilitation is a safety concern at all incidents.**

Slide 5-25

Slide 5-26

Activity 5.1
Safety at Other Incidents

Slide 5-26

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UNIT 6:
OPERATIONAL RISK MANAGEMENT

OBJECTIVES

The students will:

1. *Identify the role of the Incident Safety Officer (ISO) in emergency risk management.*

2. *Given photographs of an emergency incident and working in small groups, identify immediate risks to responders and forecast potential risks to responders.*

3. *Discuss the difference between pre-emergency and operational risk management.*

4. *Given video segments, identify immediate hazards.*

5. *Given video segments, determine the need for and the methods to terminate unsafe operations.*

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INTRODUCTION

Operational risk management involves the oversight of many forms of day-to-day operational risk. This includes the risk of loss resulting from inadequate or failed internal processes, people and systems, or external events.

It is at the incident scene, however, where it is "show time" for risk management. All of the planning that went into the development of procedures and the purchasing of protective clothing and equipment has been completed and it is time for those protective measures to do their jobs. Any responder can become the Incident Safety Officer (ISO). The Incident Commander (IC) assigns the ISO responsibility and should consider the experience and training of the available personnel before assigning the position. The ISO will then be the **Safety** Supervisor at the incident.

INCIDENT SAFETY OFFICER'S ROLE IN EMERGENCY RISK MANAGEMENT

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 minutes later.

The IC depends on the ISO to monitor the safety of the scene. This may require the ISO to issue corrective instructions to responders. This does not mean that the ISO needs to take on the role of safety cop. Safety is too important to be turned into a game. If problems are noted, the ISO should correct them in the simplest way possible. Safe strategies, safe tactics, and responder safety are the goals of the ISO, not trying to catch and punish errors.

The ISO cannot be tied down to a single location, since emergency conditions are always changing. Assigning other duties or responsibilities to the ISO is not appropriate, given the risks. Again, the ISO must look for risks of immediate danger, and evaluate the scene continuously for potential risks that may develop in the near future.

One of the ISO's first tasks as the risk manager at emergency scenes is to ensure that all pre-emergency risk management measures are in use and being followed by responders. Personal protective equipment (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 protected properly. Other pre-emergency risk management measures, such as the use of cold, warm, and hot zones for hazardous materials (hazmat) emergencies, also must be in place.

Every responder at the scene has a safety responsibility. Individual responders have a duty to:

- perform their tasks in a safe manner;
- watch out for the safety of other responders; and
- cooperate with safety control measures and procedures.

All members of the Incident Command organization have the responsibility to look out for the safety of their assigned personnel.

THE INCIDENT SAFETY OFFICERS KNOWLEDGE OF RISKS

The ISO should be well versed in the procedures of the agency and the dangers that are present at emergency scenes. A fire or emergency medical services (EMS) department's Health and Safety Officer (HSO) is an obvious resource that an ISO may call upon to help him/her with his/her responsibilities on scene. Most agencies will not designate an ISO prior to an incident. Very few agencies have the staffing or call-volume necessary to appoint an onduty ISO. Some volunteer organizations may designate an individual to serve as the ISO, but other responders will fill the position if a designated ISO is unavailable.

The ISO should know how to find and use assessment guides related to any incident type. They should know what the organization's safety standards are, and what the mutual-aid and emergency plans for their jurisdiction require (or find out about these as quickly as needed).

Whether the ISO is designated beforehand or chosen at the scene, the IC and all responders rely on him/her to keep a focus on safety.

FORECASTING

Given the fact that emergency scenes are dangerous places with rapidly changing conditions, the ISO must constantly monitor safety. The ISO must be concerned with both hazards that present an immediate danger and those that may become dangerous. The ISO must **forecast** the future of the emergency and input this into the Incident Action Plans (IAPs). No responder, not even the ISO, can predict the future with 100-percent accuracy. The ISO must rely on his/her experience, training, safety cues, and intuition to stay ahead of the emergency and predict developments that will affect safety.

A television meteorologist uses information provided by the National Weather Service (NWS), local radar, and satellite images to predict or forecast the weather. Likewise, the ISO has tools that can be used to forecast the future of an emergency. The cues or tools described below are intended to assist the ISO with structural fires, emergency medical incidents, and special Operations incidents.

The Incident Commander's Objectives and Tactics

If things do not go as the IC had hoped, responders must be able to remove themselves from the hazard area.

The ISO should contribute to and know the IC's attack plan and how it will be carried out.

Structural Fires and Forecasting

The Features of the Building

- Access to the interior may be difficult for responders. Maze-like floor plans increase risks.
- Utilities that are provided to the building: gas, electricity, steam, etc.
- Unoccupied buildings present significant dangers and less benefit for risks taken.

Fire Protection Systems

- Operating sprinklers indicate a working fire. Cold smoke may result from a fire controlled by sprinklers.
- Added weight from sprinkler water may eventually 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, indicate a special hazard is present. These systems usually are designed to discharge only one time and may create a localized oxygen-deficient atmosphere.

Access for Fire Crews

- Working in large buildings presents fatigue problems.
- If the fire appears to be in hidden spaces, opening up the area 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 alternative escape routes.
- Fires that are hidden in concealed spaces often progress very rapidly when they are exposed to oxygen.

Construction Type

Lightweight constructed roof and floor support systems often fail early under fire conditions. The stability of the building's walls are dependent on the roof structure. 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, e.g., groaning, smoking mortar, bulges.
- Look for other construction hazards such as suspended loads.
- Concrete tilt construction buildings have attachment points that are susceptible to heating and failure.

Age of the Fire Building

- 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.

The Potential for Fire Extension into Exposed Buildings

- Gauge the amount of fire involvement.
- The distance between buildings affects extension.
- Consider wind conditions.

Amount of Fire Involvement

- Big fires usually mean no survivors and less benefit from risk to firefighters engaged in interior operations.
- Lots of fire leads to early structural failure.

Roof Hazards

- Ladders at two corners allow for escape.
- Firefighters walking on structural members.
- No "roof shepherds;" once the hole is cut, get off the roof.
- If the fire is well vented, no hole is needed.
- Watch for potential collapse, bowstring trusses, lightweight wood trusses, etc.

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 the 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.

The Weather

- Temperature extremes dictate the early initiation of responder rehabilitation efforts, and more frequent work/rest cycles.
- Cold weather presents hazards in addition to hypothermia, e.g., slippery surfaces, mud.
- Frozen water from hose applications stresses the structure of the building.
- Snow or ice on the roof makes roof operations more difficult and hazardous.
- Electrical storms may create lightning hazards.
- Ground ladders may be blown over by strong winds.

Medical Emergency Forecasting Tools

Generally on medical emergencies, the ISO must consider such things as protection from communicable diseases, or protection from physical hazards, such as sharp surfaces. Use full PPE during extrication and include victims and responders who are inside the car.

Violent Acts

- If a crowd has gathered, individuals may become agitated or violent toward responders.
- The person who committed the violent act may still be in the area.
- Escape routes will be needed if the situation worsens.
- Law enforcement presence helps to ensure the safety of responders.

Protection from Surroundings

- Moving traffic--emergency vehicles should be used to shield responders from traffic if possible.
- Car/Pedestrian accident--move patients onto a curb and out of traffic for treatment, if possible.
- Weather--heat, cold, rain, sleet, etc.

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.

Special Operations Forecasting Notes

Tactical law enforcement operations are one of the obvious, special operations situations that present unique safety issues for responders. There are a few general cues that appear to apply to most special operations:

- Incident durations are likely to be longer.
- Technical experts should be present at the scene.
- Be certain that properly equipped and qualified personnel are available for rescue purposes.
- Time **generally** is less of a factor because more time is available to prepare for action.

- Time also can be an enemy to responders who may drop their guard and be less aware of hazards as the incident drags on.

Terrorism and Weapons of Mass Destruction Forecasting

Incidents involving acts of violence and obvious terrorism situations should raise the awareness of the Safety Officer. Here too, tactical law enforcement operations present special considerations for an ISO. An ISO will want to consider at least the following basic questions whenever they believe or know that this is the type incident:

- Has a "threat level" been announced by a government authority?
- Is there some organization or person living in the vicinity that might be the focus of terrorists?
- Are there too many responders close to the scene?
- Are Staging Areas being reviewed for the presence of a secondary device?

EMERGENCY MEDICAL SUPPORT

As a part of the forecasting process, the ISO should attempt to predict the need for EMS support on the scene of non-EMS emergencies. In many communities, the local EMS provider routinely responds to all structural fires. If EMS does not respond initially, the ISO should forecast the need for this support and request it from the IC.

In some cases, EMS support is required by the National Fire Protection Association's (NFPA's) 1500®, *Standard on Fire Department Occupational Safety and Health Program*. Under this standard, the highest **available** level of EMS must be provided where responders are performing special operations such as hazmat control. This support must be at least basic life support (BLS) with medical transportation available. At all other emergency incidents, the IC must evaluate the risks to responders and should request at least BLS-level EMS with transport capability to stand by at the scene, if necessary. The ISO should assist the IC with this decision.

Once EMS support has arrived on the scene, the ISO should ensure that they are prepared to provide service to responders (and the public) involved in the incident. The EMS crews should get out of their vehicles and watch for responders who are too fatigued to continue working. The ISO should attempt to secure the help of higher-level EMS providers such as paramedics, since personnel with that level of training could provide the highest level of care for responders who may be injured.

PREINCIDENT PLANNING

There is no better source of information on the hazards presented by a particular occupancy and structure or place than the preincident planning visit. These visits allow a response organization to tour a place in daylight conditions prior to an emergency. If the occupancy is active, representatives of the business can provide valuable information during the tours.

Communicating the findings of a preincident visit to other responder organizations is the key to maximizing the benefits of a visit. A short written report of the hazards discovered during the visit should be prepared and shared with responders that were not involved in the visit, such as members of other operational period shifts, or other responding organizations. The ISO is expected to coordinate the safety efforts with all other responding agencies and organizations.

PERSONNEL ACCOUNTABILITY SYSTEM

NFPA 1500®, requires fire departments to establish a written Standard Operating Procedure (SOP) for a personnel accountability system that meets the requirements of NFPA 1561®, *Standard on Emergency Services Incident Management System*. The basic accountability requirements found in the 2000 edition of the standard still apply, and are a great help to an ISO:

- Examples of system components include passports, name tags, electronic tracking devices, timers, specialized clipboards, etc.

- The accountability SOP must provide for the use of additional accountability officers based on the size and complexity of the incident. Complex incidents or incidents that occur over large areas are beyond the ability of one person to manage.

- When assigned as a company or crew, responders should remain under the supervision of their assigned supervisor. Crew integrity, staying together, under the control of an officer promotes safety and accountability. Freelancing is not good for accountability.

- Responders must follow the accountability system. Most systems depend on the active participation of all members.

RAPID INTERVENTION CREWS

Rapid Intervention Crews (RICs) are formed to facilitate the rescue of firefighters and other responders who become trapped inside of the hazard zone at an incident. They may be called RICs, Rapid Intervention Teams (RITs), Firemen's Assistance Search Teams (FASTs), companies, or many other names, but the mission is the same. The use of RICs is required in NFPA 1500®.

RICs must be equipped with all the PPE and tools that they may need to enter the hazard zone and perform a rescue. The crew must be composed of at least two members. Experience has

shown that more than two firefighters will often be needed to affect the rescue of a responder in trouble.

The staffing and makeup of an RIC is permitted to be flexible based on the type, size, and complexity of the incident. Early in the incident when few responders are on the scene, the members of the RIC are permitted to perform other tasks unless leaving those tasks to enter the hazard area would create an additional danger to responders.

When the incident escalates beyond the initial assignment of responders to the scene, a dedicated RIC must be established according to the NFPA approach. During all special operations incidents, a RIC must be designated. Depending on the type of hazards present, responders may need to be supplied with specialized equipment or higher levels of protective clothing to allow them to enter the hazard zone at a special operations incident.

RISKS

Acceptable Risks

The excitement and challenges in emergency services draw people who are willing to take risks. Emergency response personnel are action oriented. Fire, EMS, and other emergency service providers routinely accept risks that members of the general public would find too intense. The acceptance of higher levels of risk does not mean that responders should lay their lives on the line in every situation. Risks to responders are minimized by the provision of training, protective clothing and equipment, SOPs, and the use of an Incident Command System (ICS) and ISOs--all parts of a risk management approach.

Each action on the emergency scene carries with it a benefit and a risk. Acceptable risks are those for which the benefit is of more importance or value than the negative possibilities posed by the risk.

A simple risk management test can be used to help the ISO evaluate risks that are not specifically addressed in an operating procedure or Incident Command instruction. Although these criteria may sound simple, the decisions that must be made while using them 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 or conserve the environment.
- Emergency responders will risk nothing to save lives that already have been lost or property that already has been destroyed.

The International Association of Fire Chiefs (IAFC) developed *The 10 Rules of Engagement for Structural Fire Fighting and the Acceptability of Risk*, which provides an overview of risk

assessment for structural fires. The entire publication can be found in Appendix C of this course. Table 6-1 summarizes the rules of engagement and risk assessment.

Table 6-1
International Association of Fire Chiefs, The 10 Rules of Engagement for Structural Fire Fighting and Acceptability of Risk

Acceptability of Risk

1. No building or property is worth the life of a firefighter.
2. All interior firefighting involves an inherent risk.
3. Some risk is acceptable, in a measured and controlled manner.
4. No level of risk is acceptable where there is no potential to save lives or savable property.
5. Firefighters shall not be committed to interior offensive firefighting operations in abandoned or derelict buildings.

Risk Assessment

1. All feasible measures shall be taken to limit or avoid risks through risk assessment by a qualified officer.
2. It is the responsibility of the incident commander to evaluate the level of risk in every situation.
3. Risk assessment is a continuous process for the entire duration of each incident.
4. If conditions change, and risk increases, change strategy and tactics.
5. No building or property is worth the life of a firefighter.

International Association of Fire Chiefs

Unacceptable Risks

Some risks are clearly unacceptable, even for emergency responders. This fact should be addressed in the response agency's Risk Management Plan. It is the ISO present at each incident who must interpret and apply the IAP and its safety aspects. This is why the ISO should have input into the plan's development.

There is no reason to risk the life of an EMS responder, for instance, 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 a lack of information or inaccurate information about a situation.

Most Command decisions are made with the best information available at the time and with awareness of the risks. However, in some cases the IC may make a tactical decision without being aware of all of the risks. In other situations, the IC may decide to take a significant risk because of the significant benefit that will occur if the decision pays off. The ISO must continuously evaluate the situation to ensure that the IC is aware of the risks of an operation and the consequences if something goes wrong. If the ISO believes that an operation, or any part of it, presents an unacceptable, imminent danger to responders, he/she has the authority to alter, suspend, or terminate part or all of the operation.

TERMINATING UNSAFE OPERATIONS

The ISO should seek to alter, suspend, or terminate operations that present an imminent safety hazard. The NFPA standards and some Federal regulations call for the ISO to have the authority to order changes in operations. These standards and regulations are incorporated into the laws of most States.

NFPA 1521®, *Standard for Fire Department Safety Officer*

This standard contains the minimum requirements for the assignment, duties, and responsibilities of an HSO and ISO for a fire department.

> §2-5.1 - At an emergency incident, where activities are judged by the incident safety officer to be unsafe or involve an imminent hazard, the incident safety officer shall have the authority to alter, suspend, or terminate those activities. The incident safety officer shall immediately inform the incident commander of any actions taken to correct imminent hazards at the emergency scene.

NFPA 1561®, *Standard on Emergency Services Incident Management System*

This standard contains the minimum requirements for an incident management system to be used by emergency services to manage all emergency incidents.

> §3-2.2.2 – The incident safety officer or assistant incident safety officer(s) shall have the authority to immediately correct situations that create an imminent hazard to responders.

Occupational Safety and Health Administration, Hazardous Waste Operations and Emergency Response

Hazardous Waste Operations and Emergency Response (HAZWOPER), Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 regulation reads:

> (q) (3) (viii) - 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 of any actions needed to be taken to correct these hazards at the emergency scene. (Parenthetical phrases added for explanation.)

While the ISO does have the authority to alter, suspend, or terminate an activity, this authority must be balanced with the need to protect the lives of responders and the ISO's role in the ICS. The ISO is a support officer for the IC. In most cases when the ISO identifies a safety risk, minor action will address the problem (e.g., asking a responder to wear gloves; coordinating the establishment of a collapse zone with a sector officer). The need to terminate an operation without first consulting with a sector officer or the IC is extremely rare and reserved for hazards that truly present an imminent danger.

The decision to terminate, suspend, or alter an operation or a 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 operation 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.

The ISO must be able to defend the action to the IC if the ISO independently decides to terminate, suspend, or alter a significant part of an operation. Because the ISO is a support officer, the IC may choose to reverse the decision and continue an operation. It is in the best interest of the ISO, the IC, and the responders to keep communications between the ISO and the IC positive and supportive rather than confrontational.

The ISO cannot engage in hours of discussion. If time permits, he/she should consult face-to-face with the IC prior to terminating an operation. These decisions tend to be significant events and remembered for a long time by both the IC and the ISO. However, the ISO must remember his/her primary function is ensuring the safety of operations; future career considerations are secondary.

SUMMARY

The ISO is the onscene risk manager. The ISO uses agency Risk Management Plans, risk management techniques, training, experience, safety cues, SOPs and Standard Operating Guidelines (SOGs), and intuition to perform his/her job. While the ISO has a responsibility for the safety of responders, he/she must operate as a support officer for the IC. The ISO must look for immediate risks and forecast risks that may threaten safety. The ISO has the authority to alter, suspend, or terminate an unsafe operation. Good communication between the ISO and the IC helps assure the safety of the public and responders.

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Activity 6.1

Immediate Risks to Responders

Purpose

To identify immediate risks posed to responders.

Directions

As a class, view the photographs and identify immediate risks to the responders pictured, or to responders who may soon arrive at the emergency depicted. Be sure to include EMS safety issues.

Extrication: _____

_____

_____

_____

_____

_____

Smoky house fire: _____

_____

_____

_____

_____

_____

Car fire:

House fire through the roof:

Firefighters at vent hole with fire:

Shed fire overhaul:

Sparks overhead: _____

Firefighter on wood shingle roof: _____

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Activity 6.2

Risk Forecasting

Purpose

To forecast risks to emergency responders.

Directions

1. Work in your assigned small groups.

2. View the photographs and forecast risks to responders and to the public. Be sure to **concentrate your discussions on risks that may occur in the future**, not those immediate risks that may be present in the photograph.

3. Prepare a list of the forecasted risks that you and the members of your group discussed. Be sure to discuss the safety of any operational strategies and tactics that might be used. Also, be sure to discuss safety issues for each type of responder.

4. Prioritize the risks and appoint a spokesperson to present the five most severe risks identified by your group. You will have 45 minutes to complete the activity.

Large house fire: _____

Freeway extrication in the snow: _____

Smokey two-story house fire:

Commercial building fire:

Storage center fire:

House fire with fire through windows:

Muffler shop fire: _____

Fuel tanker fire: _____

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Activity 6.3

Terminating Unsafe Operations

Purpose

To determine the need to terminate unsafe operations that present an imminent risk to responders, and to be able to communicate those decisions effectively to the IC.

Directions

1. As a large group, view the video scenarios.

2. As you view the video, observe the actions of the responders and look for immediate risks that would require the intervention of an ISO. Be sure to look for risk issues that are related to EMS responders as well as firefighters.

3. When you see a situation that demands an immediate stop to assure responder safety, speak up. The instructor will stop the video and you will have the opportunity to explain your decision.

4. As you explain your decision to terminate the operation, use the language that would be used on an actual incident to communicate your decision to the IC.

5. Once the explanation of a terminated operation is completed, the instructor will allow the video to proceed so that other hazards may be viewed.

Scenario 1

Scenario 2

Scenario 3

Scenario 4

Scenario 5

Scenario 6

Scenario 7

Scenario 8

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NOTE-TAKING GUIDE

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UNIT 6: OPERATIONAL RISK MANAGEMENT

Slide 6-1

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OBJECTIVES

The students will:

- **Identify role of the Incident Safety Officer (ISO) in emergency risk management.**
- **Given photographs of an emergency incident and working in small groups, identify immediate risks to responders and forecast potential risks to responders.**
- **Discuss the difference between pre-emergency and operational risk management.**
- **Given video segments, identify immediate hazards.**
- **Given video segments, determine the need for and the methods to terminate unsafe operations.**

Slide 6-2

Slide 6-3

INTRODUCTION

- **Operational risk management involves the oversight of many forms of day-to-day operational risk.**
- **At an incident scene, it is show time for risk management too.**
- **Officers and firefighters alike need to learn safety best practices.**

Slide 6-3

Slide 6-4

EMERGENCY RISK MANAGEMENT

- **ISO must continually monitor the scene and operations.**
- **The ISO should ensure that preplanned measures are in use--e.g., is the personal protective equipment (PPE) in use.**
- **Everyone has safety responsibility:**
  - **Perform in safe manner.**
  - **Watch out for other responders.**
  - **Cooperate with safety procedures.**

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Slide 6-5

KNOWLEDGE OF RISKS

- **ISO should be well versed in procedures and dangers that are present at scenes.**
- **Anyone, at anytime, may be appointed to act as a Safety Officer.**
- **Pay attention at Operations and at training and education opportunities to build your knowledge.**

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Slide 6-6

Activity 6.1
Immediate Risks to Responders

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Slide 6-7

FORECASTING

- **The ISO should contribute to and know the Incident Action Plan's (IAP's) objectives, strategies, and tactics.**
- **The ISO is to look for immediate dangers and also try to forecast into the future of the incident or event management.**
- **Incident Command Staff and General Staff depend on and work with the Safety Officer.**

Slide 6-7

Slide 6-8

WEATHER--TOOLS

- **Weather affects fire, hazardous materials (hazmat), and other incidents:**
  - **National Weather Service (NWS)**
  - **Local meteorologists**
  - **Local radar**
  - **Satellite images**
  - **Observations and a Geographic Information System (GIS)**
- **Temperature extremes affect operations**

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STRUCTURAL FIRES-- TOOLS AND CUES

- **Features of the building**
- **Fire protection systems**
- **Access for fire crews**
- **Egress for crews**
- **Construction type**
- **Age of building**
- **Potential for extension**

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Slide 6-10

STRUCTURAL FIRES-- TOOLS AND CUES (cont'd)

- **Amount of fire involvement**
- **Roof hazards**
- **Time**
- **Weather**

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Slide 6-11

MEDICAL EMERGENCY-- TOOLS AND CUES

- **Potential for violent acts makes escape routes important and law enforcement an ally**
- **Protection from surroundings including from the weather**
- **Sufficient staffing for triage and/or to carry and load**
- **Communicable diseases**

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Slide 6-12

FORECASTING EMERGENCY MEDICAL SUPPORT

- **ISO should forecast the need for emergency medical services (EMS) support.**
- **Often required by the National Fire Protection Association (NFPA) 1500®.**
- **EMS crews should be alert for responders in need of help.**

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Activity 6.2
Risk Forecasting

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PERSONNEL ACCOUNTABILITY SYSTEM FOR RESPONDERS

- **Responder organizations should have the components that make the system effective.**
- **Incident Commanders (ICs) should establish resource management approaches (check-in, staging, assignments, supervision, and reporting).**
- **Fire departments should have Standard Operating Procedures (SOPs) appropriate to the different type incidents.**
- **ISOs are to review the Medical Plans.**

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TAKING RISKS

- **Acceptable risks.**
  - **Inherent to the job.**
  - **Planned and controlled.**
- **Unacceptable risks.**
  - **Not all risk decisions are simple.**
  - **A risk is not worth a responder's life.**
- **Safety Officers will advise Incident Command and Operation Units.**

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Slide 6-16

TERMINATING UNSAFE OPERATIONS

- **Per NFPA 1521®, NFPA 1561® standards and Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations.**
- **The ISO has the authority to alter, suspend, or terminate operations that present imminent safety hazard.**
- **Safety Officer under the Incident Command System (ICS) can do this too.**

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SUMMARY

- **The ISO is the onscene risk manager.**
- **The ISO uses the risk management process, techniques, training, experience, safety cues, SOPs, and intuition to perform his/her job.**
- **The ISO must look for immediate risks and forecast risks in the future.**

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Activity 6.3
Terminating Unsafe Acts

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VIDEO:

"Scenarios"

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UNIT 7:
CLOSING AND COURSE SUMMARY

OBJECTIVE

The students will review the major topics covered in this course.

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CLOSING AND COURSE SUMMARY

This course has given you basic information about the role and functions of the Incident Safety Officer (ISO). It has provided information on risk management assessments and safety issues at various incidents.

The following topics were covered in this course:

- duties and responsibilities of an ISO;
- factors that contribute to firefighter fatalities and injuries;
- components of the risk management process;
- pre-emergency risk management strategies, including Risk Management Plans;
- relevant safety issues;
- risk and safety approaches at wildland fire incidents, highway traffic incidents, and acts of violence;
- forecasting risks;
- incident scene rehabilitation;
- relevant National Fire Protection Association (NFPA) standards; and
- termination of unsafe operations.

There is one component that this course, unfortunately, cannot provide: **experience**. A person designated as the ISO must have the experience and intuition to understand the operations of an incident. ISOs must have a thorough understanding of the Incident Command System (ICS) used by their department. Once personnel have these items in their personal toolboxes, they will be a valuable resource to the department as an ISO.

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NOTE-TAKING GUIDE

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UNIT 7:
CLOSING AND COURSE SUMMARY

Slide 7-1

Slide 7-2

OBJECTIVE

The students will review the major topics covered in this course.

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COURSE COVERED

- **Duties and responsibilities of an Incident Safety Officer (ISO)**
- **Rates and causes of firefighter fatalities and injuries**
- **Relevant National Fire Protection Association (NFPA) standards**
- **Components of the risk management process**

Slide 7-3

Slide 7-4

OPERATIONAL CUES AND TOOLS

- **Identify and apply the pre-emergency risk management strategies and plans on scene--including ICS.**
- **Use the risk management process.**
- **What are the safety cues for wildland fire incidents, highway incidents, acts of violence, and other incident types?**
- **Know ICS Form 215A, *Incident Action Plan Safety Analysis*.**

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Slide 7-5

MANAGEMENT BY THE SAFETY OFFICER FOR AN INCIDENT

- **Command Staff responsibilities under National Incident Management Systems (NIMS)/ICS**
- **Monitoring, assessing, and forecasting, and contributing to the Incident Action Plan (IAP)**
- **Termination of unsafe operations**

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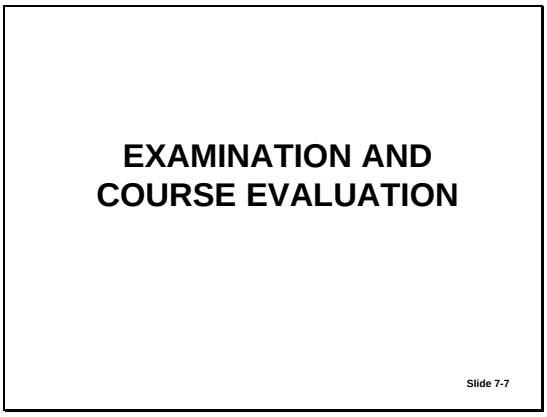
Slide 7-6

SUMMARY

- **Knowledge about the role of the Safety Officer for an incident--it's critical for all responders to know and appreciate.**
- **With a set of items in a toolbox, an ISO will be a valued incident manager--a critical part of the Command Staff.**
- **The only item missing is experience--that's up to you.**

Slide 7-6

Slide 7-7



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APPENDIX A
SOURCES OF ADDITIONAL INFORMATION

United States Fire Administration
National Fire Academy
16825 South Seton Avenue
Emmitsburg, MD 21727
(301) 447-1000
http://www.usfa.dhs.gov
http://www.usfa.dhs.gov/nfa

National Fallen Firefighters Foundation
Everyone Goes Home Firefighter Life Safety Initiatives
PO Drawer 498
Emmitsburg, MD 21727
(301) 447-1365
http://www.firehero.org
http://www.everyonegoeshome.com

Learning Resource Center
National Emergency Training Center
16825 South Seton Avenue
Emmitsburg, MD 21727
(301) 447-1030
http://www.lrc.fema.gov

Occupational Safety and Health Administration
200 Constitution Avenue NW
Washington, DC 20210
(800) 321-OSHA (6742)
http://www.osha.gov

Centers for Disease Control and Prevention
1600 Clifton Road, N.E.
Atlanta, GA 30333
(800) CDC-INFO (232-4636)
http://www.cdc.gov

National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention
(800) CDC-INFO (232-4636)
http://www.cdc.gov/niosh

Fire Fighter Fatality Investigation and Prevention Program
National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention
http://www.cdc.gov/niosh/fire

U.S. Government Printing Office
Washington, DC 20402
(202) 512-1800
(866) 512-1800
http://www.access.gpo.gov

Federal Highway Administration
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590
(202) 366-4000
http://www.fhwa.dot.gov

Manual on Uniform Traffic Control Devices
http://mutcd.fhwa.dot.gov/

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269
(617) 770-3000
http://www.nfpa.org

International Association of Fire Fighters
Occupational Health, Safety and Medicine Department
1750 New York Avenue, NW Suite 300
Washington, DC 20006-5395
(202) 737-8484
http://www.iaff.org/hs

International Association of Fire Chiefs
Safety, Health and Survival Section
(703) 273-0911
4025 Fair Ridge Drive
Fairfax, VA 22033
http://www.iafcsafety.org
http://www.iafc.org

National Safety Council
1121 Spring Lake Drive
Itasca, IL 60143-3201
(630) 285-1121
http://www.nsc.org

Responder Safety Institute
http://www.respondersafety.com

Fire Department Safety Officers Association
P.O. Box 149
Ashland, MA 01721
(508) 881-3114
http://www.fdsoa.org

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APPENDIX B
FIREFIGHTER SAFETY AND HEALTH STANDARDS AND REGULATIONS

NFPA Standards	
NFPA 403	Standard for Aircraft Rescue and Fire Fighting Services at Airports
NFPA 472	Standard for Professional Competence of Responders to Hazardous Materials Incidents
NFPA 473	Standard for Competencies for EMS Personnel Responding to Hazardous Materials/WMD Incidents
NFPA 1001	Standard for Fire Fighter Professional Qualifications
NFPA 1002	Standard for Fire Apparatus Driver/Operator Professional Qualifications
NFPA 1021	Standard for Fire Officer Professional Qualifications
NFPA 1026	Standard for Incident Management Personnel Professional Qualifications
NFPA 1051	Standard for Wildland Fire Fighter Professional Qualifications
NFPA 1201	Standard for Developing Fire Protection Services for the Public
NFPA 1221	Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems
NFPA 1250	Recommended Practice in Emergency Service Organization Risk Management
NFPA 1403	Standard on Live Fire Training Evolutions
NFPA 1404	Standard for Fire Service Respiratory Protection Training
NFPA 1407	Standard for Fire Service Rapid Intervention Crews
NFPA 1410	Standard on Training for Initial Emergency Scene Operations
NFPA 1451	Standard for a Fire Service Vehicle Operations Training Program
NFPA 1500	Standard on Fire Department Occupational Safety and Health Program
NFPA 1521	Standard for Fire Department Safety Officer
NFPA 1561	Standard on Emergency Services Incident Management System
NFPA 1581	Standard on Fire Department Infection Control Program
NFPA 1582	Standard on Comprehensive Occupational Medical Program for Fire Departments
NFPA 1583	Standard on Health Related Fitness Programs for Fire Fighters
NFPA 1584	Recommended Practice on the Rehabilitation for Members Operating at Incident Scene Operations and Training Exercises
NFPA 1851	Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles
NFPA 1901	Standard for Automotive Fire Apparatus
NFPA 1906	Standard for Wildland Fire Apparatus
NFPA 1911	Standard for Service Tests of Fire Pump Systems on Fire Apparatus
NFPA 1932	Standard on Use, Maintenance, and Service Testing of Fire Department Ground Ladders
NFPA 1936	Standard on Powered Rescue Tool Systems
NFPA 1961	Standard for Fire Hose
NFPA 1971	Standard on Protective Ensemble for Structural Fire Fighting and Proximity Fire Fighting
NFPA 1975	Standard on Station/Work Uniforms for Emergency Services

NFPA 1977	Standard on Protective Clothing and Equipment for Wildland Fire Fighting
NFPA 1981	Standard on Open-Circuit Self-Contained Breathing Apparatus for Emergency Services
NFPA 1982	Standard on Personal Alert Safety Systems (PASS)
NFPA 1983	Standard on Fire Service Life Safety Rope and System Components
NFPA 1984	Standard on Respirators for Wildland Fire Fighting Operations
NFPA 1989	Standard on Breathing Air Quality for Emergency Services Respiratory Protection
NFPA 1991	Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies (2000)
NFPA 1992	Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies (2000)
NFPA 1994	Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents
NFPA 1999	Standard on Protective Clothing for Emergency Medical Operations (1997)

Department of Labor, Occupational Safety and Health Administration Title 29 Code of Federal Regulations	
1910.95	Occupational Noise Exposure
1910.120	Hazardous Waste and Emergency Operations
1910.1030	Occupational Exposure to Bloodborne Pathogens
1910.134	Respiratory Protection
1910.146	Permit-Required Confined Spaces
1910.156	Fire Brigades
1910.133	Eye and Face Protection
1910.20	Access to Employees Exposure and Medical Records

Federal Highway Administration Department of Transportation Title 23 Code of Federal Regulations	
634	Use of High-Visibility Apparel When Working on Federal-Aid Highways

American National Standards Institute (ANSI)	
ANSI/CGA G7.1	Commodity Specifications for Air
ANSI/Z87.1	Practice for Occupational and Educational Eye and Face Protection
ANSI/ISEA 207-2006	High-Visibility Public Safety Vests

APPENDIX C
INTERNATIONAL ASSOCIATION OF FIRE CHIEFS
THE 10 RULES OF ENGAGEMENT FOR STRUCTURAL FIRE FIGHTING AND THE ACCEPTABILITY OF RISK

International Association of Fire Chiefs

The 10 Rules of Engagement for Structural Fire Fighting

and the Acceptability of Risk

Prepared by the
ICHIEFS Health and Safety Committee
August, 2001

ACCEPTABILITY OF RISK

All fire fighting and rescue operations involve an inherent level of risk to fire fighters.

- A basic level of risk is recognized and accepted, in a measured and controlled manner, in efforts that are routinely employed to save lives and property. ***These risks are not acceptable in situations where there is no potential to save lives or property.***

- A higher level of risk is acceptable only in situations where there is a ***realistic potential*** to save known endangered lives. This elevated risk must be limited to operations that are ***specifically directed toward rescue*** and where there is a ***realistic potential to save the person(s) known to be in danger.***

RULES OF ENGAGEMENT FOR STRUCTURAL FIREFIGHTING

All structural fire fighting operations involve an inherent level of risk to fire fighters. All feasible measures shall be taken to limit or avoid these risks through risk assessment, constant vigilance and the conscientious application of safety policies and procedures.

- The exposure of fire fighters to an elevated level of risk is acceptable only in situations where there is a realistic potential to save known endangered lives.
- ***No property is worth the life of a fire fighter.***
- ***No risk to the safety of fire fighters is acceptable in situations where there is no possibility to save lives or property.***

- Fire fighters shall not be committed to interior offensive fire fighting operations in abandoned or derelict buildings that are known or reasonably believed to be unoccupied.

RISK ASSESSMENT

It is the responsibility of the incident commander to evaluate the level of risk in every situation. This risk evaluation shall include an assessment of the presence, survivability and potential to rescue occupants. When there is no potential to save lives, firefighters shall not be committed to operations that present an elevated level of risk.

An incident command system shall be established, beginning with the arrival of the first fire department member at the scene of every incident. The incident commander must conduct an initial risk analysis to consider the risk to fire fighters in order to determine the strategy and tactics that will be employed.

The responsibility for risk assessment is a continuous process for the entire duration of each incident. The incident commander shall continually reevaluate conditions to determine if the level of risk has changed and a change in strategy or tactics is necessary. The incident commander shall assign one or more safety officers to monitor and evaluate conditions to support this risk analysis.

At a minimum the risk analysis for a structure fire shall consider:

Building Characteristics

- Construction type and size
- Structural condition
- Occupancy and contents

Fire Factors

- Location and extent of the fire
- Estimated time of involvement
- What are smoke conditions telling us?

Risk to Building Occupants

- Known or probable occupants
- Occupant survival assessment

Fire Fighting Capabilities

- Available resources
- Operational capabilities and limitation

10 Rules of Engagement for Structural Fire Fighting

Acceptability of Risk

1 No building or property is worth the life of a fire fighter.

2 All interior fire fighting involves an inherent risk.

3 Some risk is acceptable, in a measured and controlled manner.

4 No level of risk is acceptable where there is no potential to save lives or savable property.

5 Fire fighters shall not be committed to interior offensive fire fighting operations in abandoned or derelict buildings.

Risk Assessment

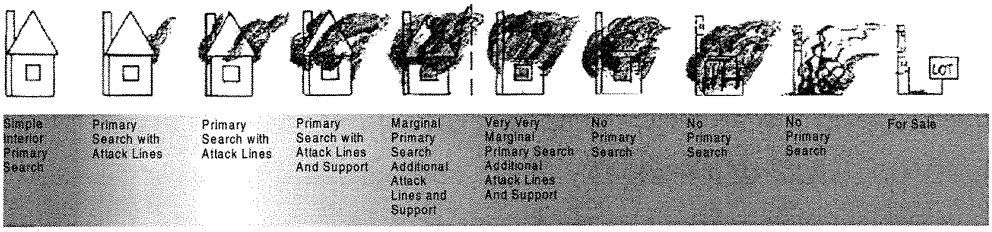
1 All feasible measures shall be taken to limit or avoid risks through risk assessment by a qualified officer.

2 It is the responsibility of the Incident Commander to evaluate the level of risk in every situation.

3 Risk assessment is a continuous process for the entire duration of each incident.

4 If conditions change, and risk increases, change strategy and tactics.

5 No building or property is worth the life of a fire fighter.



Risk Assessment/Rules of Engagement			
Fire Fighter Injury/ Life Safety Risk	**High Probability of Success**	**Marginal Probability of Success**	**Low Probability of Success**
Low Risk	**Initiate offensive operations. Continue to monitor risk factors.**	**Initiate offensive operations. Continue to monitor risk factors.**	**Initiate offensive operations. Continue to monitor risk factors.**
Medium Risk	**Initiate offensive operations. Continue to monitor risk factors. Employ all available risk control options.**	**Initiate offensive operations. Continue to monitor risk factors. Be prepared to go defensive if risk increases.**	**Do not initiate offensive operations. Reduce risk to fire fighters and actively pursue risk control options.**
High Risk	**Initiate offensive operations only with confirmation of realistic potential to save endangered lives.**	**Do not initiate offensive operations that will put fire fighters at risk for injury or fatality.**	**Initiate defensive operations only.**

APPENDIX D
ICS FORM 215A

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INCIDENT ACTION PLAN SAFETY ANALYSIS			1. Incident Name						2. Date / 3. Time
Division or Group	Potential Hazards								Mitigations (e.g., PPE, buddy system, escape routes)
	Type of Hazard:	Type of Hazard:	Type of Hazard:	Type of Hazard:	Type of Hazard:	Type of Hazard:	Type of Hazard:	Type of Hazard:	
Prepared by (Name and Position)									

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