Hazardous Materials Incident Management

HMIM-Student Manual

5th Edition, 1st Printing-April 2014



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April 2014
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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 DHS' fire protection and emergency response expert. USFA is located at the National Emergency Training Center (NETC) in Emmitsburg, Maryland, and includes NFA, the National Fire Data Center (NFDC), and the National Fire Programs (NFP). USFA also provides oversight and management of the Noble Training Center in Anniston, Alabama. The mission of 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.

USFA's NFA offers a diverse course delivery system, combining resident courses, off-campus deliveries in cooperation with state training organizations, weekend instruction, and online courses. 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.

This six-day course addresses systemic issues in managing a hazardous materials (hazmat) or weapons of mass destruction (WMD) incident safely to conclusion. This course complements the two hazardous materials initial response courses that emphasize basic informational and operational skills. It concentrates on integrating knowledge about hazmat or WMD scenarios with information about local hazmat incident plans and response systems.

Through decision-making activities appropriate for hazmat personnel operating at the Incident Commander (IC) level, the students will apply the course information, which is defined by current regulations and standards.

The course is for personnel with hazmat and WMD incident management functions. In order of priority, they are members of fire service hazmat response or management teams, hazmat company officers, training officers, chief officers, and members of hazmat response teams from allied agencies.

The completion of "The Chemistry of Hazardous Materials" course or equivalent knowledge is recommended. Together with the chemistry course, this course should meet all the current cognitive criteria based on federal laws and National Fire Protection Association (NFPA) standards. Relevant legislation and standards are Occupational Safety and Health Administration 29 Code of Federal Regulations (OSHA 29 CFR) 1910.120, Environmental Protection Agency (EPA) 40 CFR 311, and NFPA Standards 471 and 472.

Psychomotor criteria will be addressed, but they remain the domain of state and local jurisdictions.

This course replaces the previous "Hazardous Materials Incident Management" course.

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Acronyms

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COURSE SCHEDULE

Unit 0:	Introduction and Overview
Unit 1:	Standard of Care
Unit 2:	Incident Command System
Unit 3:	Decision-Making
Unit 4:	Operational Considerations
Unit 5:	Hazmat Special Incident Considerations
Unit 6:	Managing Hazardous Materials Incidents

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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 0:
INTRODUCTION AND OVERVIEW

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INTRODUCTION

The events of Sept. 11, 2001, brought about profound changes in our way of life. Following these events, President George W. Bush signed a series of Executive Orders resulting in the creation of the White House Office of Homeland Security in October 2001, and the subsequent creation of the Department of Homeland Security (DHS) in 2002. Prior to creation of DHS, the Federal Emergency Management Agency (FEMA) and other key DHS organizations operated independently or within the organizational structure of agencies with different missions. The need for improved information sharing among intelligence-gathering and law-enforcement organizations led Congress to create the DHS. One of the biggest changes in federal government, since the Department of Defense (DOD) was created in 1947 by President Truman, is that DHS provides the unifying core for the vast national network of organizations and institutions involved in efforts to make our nation secure.

The organizational structure of DHS encourages improved communications among its various components; however, a great deal of work remains to ensure that federal, state and local government organizations operate effectively within the framework established by DHS. To encourage these organizations to work cooperatively and efficiently, the President issued a series of Homeland Security Presidential Directives (HSPDs) designed to establish a working framework for leading unified efforts to respond to emergencies and the nation's security.

OVERVIEW

There are seven units in this course.

1. Unit 0: Introduction and Overview.
2. Unit 1: Standard of Care.
3. Unit 2: Incident Command System.
4. Unit 3: Decision-Making.
5. Unit 4: Operational Considerations.
6. Unit 5: Hazmat Special Incident Considerations.
7. Unit 6: Managing Hazardous Materials Incidents.

COURSE GOALS

The students will be able to implement effective and compliant management procedures for a hazmat/weapons of mass destruction (WMD) incident; develop hazmat/WMD incident objectives, strategies and tactics appropriate for a simulated hazmat/WMD incident; develop and document a safe and effective Incident Action Plan (IAP) for a simulated hazmat/WMD incident; and develop and institute an appropriate Command structure for simulated hazmat/WMD incidents.

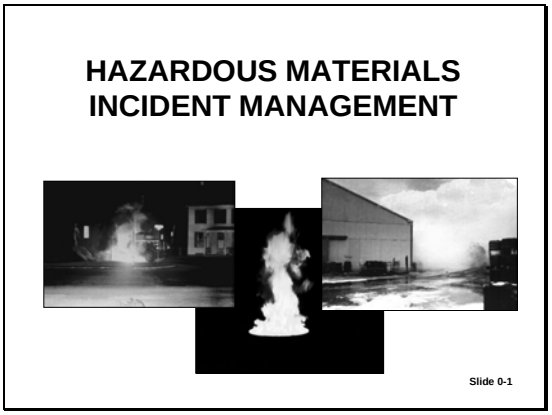
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NOTE-TAKING GUIDE

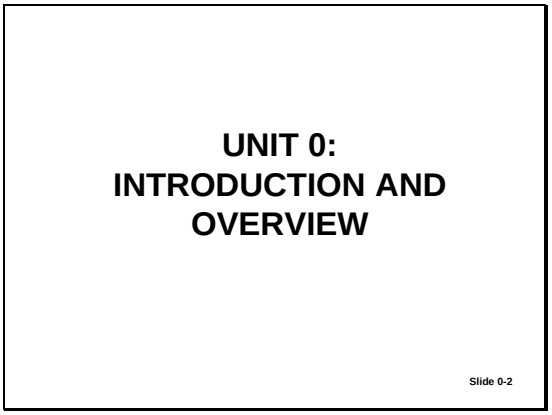
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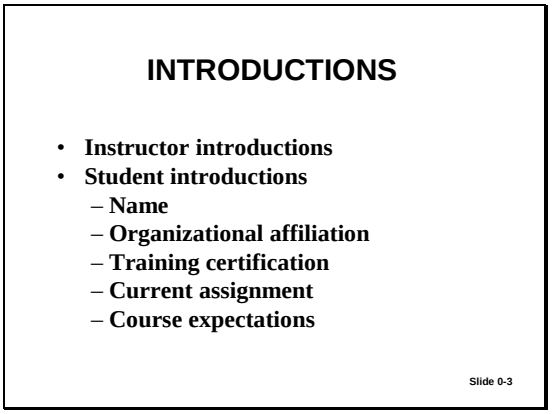
Slide 0-1



Slide 0-2



Slide 0-3



Slide 0-4

WELCOME

- **Administrative issues**
- **Target audience**
  - **– Incident Commanders (ICs)**
  - **– Hazardous materials/Weapons of mass destruction (hazmat/WMD) officers**
  - **– Safety Officers**
  - **– Public health**
  - **– Law enforcement**



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OVERVIEW

Seven units:

- **Unit 0: Introduction and Overview**
- **Unit 1: Standard of Care**
- **Unit 2: Incident Command System**
- **Unit 3: Decision-Making**
- **Unit 4: Operational Considerations**
- **Unit 5: Hazmat Special Incident Considerations**
- **Unit 6: Managing Hazardous Materials Incidents**

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COURSE GOALS

The students will be able to:

- **Implement effective and compliant management procedures for a hazmat/ WMD incident.**
- **Develop hazmat/WMD incident objectives, strategies and tactics appropriate for a simulated hazmat/WMD incident.**

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COURSE GOALS (cont'd)

- **Develop and document a safe and effective Incident Action Plan (IAP) for a simulated hazmat/WMD incident.**
- **Develop and institute an appropriate Command structure for simulated hazmat/WMD incidents.**

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Slide 0-8

GRADING SYSTEM

- **Students are required to obtain a 70 percent score or above to successfully complete the course.**
- **Final course grade will be calculated as defined in the grading methodology and issued as identified below:**
  - **90-100 = A**
  - **80-89 = B**
  - **70-79 = C**
  - **60-69 = D**
  - **0-59 = F**
- **Students are expected to attend 100 percent of the course and are required to attend 90 percent in order to complete the course regardless of grade.**

Slide 0-8

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UNIT 1: STANDARD OF CARE

TERMINAL OBJECTIVES

The students will be able to:

1. *Explain the components of the standard of care and their implications for hazardous materials/weapons of mass destruction (hazmat/WMD) response.*

2. *Explain the potential civil and criminal liability implications for the Incident Commander (IC) and other emergency responders during a hazmat/WMD incident.*

ENABLING OBJECTIVES

The students will:

1. *Define standard of care.*

2. *Differentiate among laws, regulations and standards.*

3. *Identify the legislative and regulatory basis for the hazmat/WMD standard of care.*

4. *Identify the three primary National Fire Protection Association (NFPA) standards that establish the basis for the hazmat/WMD emergency response.*

5. *Describe how using the National Incident Management System (NIMS)-compliant Incident Action Plans (IAPs), adhering to the standard of care, fully documenting decisions, and other actions can reduce their liability exposure.*

6. *Identify the following terms and their implications as they relate to hazmat/WMD response: sovereign immunity, negligence, gross negligence, intentional misconduct (malfeasance), tort, vicarious liability, and individual liability.*

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INTRODUCTION

Incident Commanders (ICs) at a hazardous materials (hazmat) response site are responsible for the health and safety of everyone on the site. This can include personnel from fire, police, public works, and emergency medical; local, state and federal agencies; and the general public. The development of a standard of care has helped ensure the proper response and training of responders.

The IC also is responsible for the success of the operation and for developing strategic goals, tactical objectives, and tactical methods that bring the incident to a safe completion. To accomplish this, the IC must have a workable decision-making process in place. This course will provide you with an accepted process.

Along with the Safety Officer, the IC is responsible for implementing the Incident Action Plan (IAP) and may be responsible for assisting in its development. The IC maintains paperwork that documents all aspects of the incident and is responsible for conducting the debriefing and critique of the incident.

A chemical incident may expand far beyond the means of most jurisdictions to control it. The IC must know when and where to call for assistance and how to establish a Unified Command. The news media must be dealt with honestly during an incident.

Chemical emergencies challenge the IC in ways unheard of only a few years ago. In most nonchemical responses, fast and definitive actions are the rule, and all responders know their respective roles and responsibilities. Fast action at a chemical incident, however, may lead to disastrous results. This is one type of response where the IC must make certain of the situation — and the hazards involved — before taking any offensive actions.

The purpose of this course is to help the hazmat IC understand the duties, responsibilities and liabilities of all emergency responders so the IC can coordinate and integrate all phases of the incident effectively. This coordination and integration occurs through an effective incident management system based on fire service concepts and procedures as these relate to current law and standards.

This course will examine the responsibilities and tasks associated with analyzing an incident, planning a response, implementing a plan, evaluating operational progress, and terminating the incident, while emphasizing legal aspects and liabilities facing the IC. These tasks will incorporate preincident, on-scene and post-incident operations. This course is not intended to teach the Incident Command System (ICS) nor hazmat operational methods or tactics. It is a course for ICs.

LIABILITY ISSUES

Effective response to emergencies and disasters is becoming increasingly complex. Those involved in preparing for and responding to emergencies caused by natural or man-made events, or even terrorist attacks, need to understand complicated weather patterns, human behavior, chemicals, computers, transportation systems, laws, and agency regulations.

Public, private, and nonprofit managers and employees, as well as volunteers, have become increasingly aware that legal issues have an impact on emergency management. All parties involved are concerned with their liability as they prepare for and are called on to respond to disasters.

There is an increasing concern about potential liability, including a greater concern with personal financial risk. There is a general trend to a litigious society with a greater number of suits against public organizations. Responders increasingly perceive liability as a threat.

State and federal law provides means for filing claims against governmental units, their employees, and their agents for injuries resulting from actions taken in preparation for and in response to a disaster or emergency. The law includes both state and federal statutes, constitutional provisions, and court decisions.

Although complex, the law is based on principles that clarify individual responsibilities and rights. This unit is intended to provide an introduction to these principles of law and, through case examples of emergencies and disasters, identify the areas of law that affect liability in emergency planning activities.

With an understanding of potential liability problems, those involved in emergency management can seek guidance from legal counsel on how to avoid or minimize exposure.

Sovereign Immunity

Under the principle of sovereign immunity, individuals harmed by the action of a governmental unit cannot recover damages from the state or its political subdivisions unless the governmental unit agrees to pay the claim. However, many states no longer subscribe to sovereign immunity. From the 1960s through the 1980s, more and more states abolished sovereign immunity. Each state defines the extent of liability; the result is that sovereign immunity is either retained, abolished or adapted in some way.

State law may provide immunity in one or more ways:

- State tort act.
- State emergency management act.
- Discretionary immunity.
- Governmental/Proprietary immunity.
- Public safety provisions for officials such as firefighters and police personnel.

On the other hand, immunity may be lost by:

- Gross negligence.
- Intentional misconduct (malfeasance).
- No immunity for private contractors.
- No immunity for those responsible for the incident.

Tort

A tort is an act that harms another. It occurs when a person commits an act, or fails to act, without right, and as a result another is harmed, directly or indirectly. A tort may lead to a civil action for personal injuries or property damage. Torts include intentional acts, negligence, and strict or absolute liability.

A civil action provides a means for a person harmed by another to be compensated for personal loss. Many feel that individuals harmed by a public unit should to some degree be compensated, and a civil action can provide a basis for distributing liability.

Negligence

Negligence is the unintentional invasion of a person's interest that is protected by law, where the actor is at fault, and where the actor's conduct is the legal cause of the injury suffered. Injury to another does not establish liability, per se. A person owes a duty to another to exercise care. Governmental units and employees are most often sued for damages for alleged negligence.

Elements of Negligence

Negligence has the following common elements. The absence of proof of any one element will defeat a finding of liability.

- The existence of a duty, recognized by law, for a person (here the governmental employee) to conform to a standard of care, defined by common law (based upon judicial decisions) or by statute.
- A failure to conform to that standard of care, or to carry out the duty.
- Actual loss or damage to the injured party(ies).
- A causal connection between the act of the wrongdoer (his or her negligence) and a resulting injury to a third party(ies).

All negligence cases have these elements in common. Absence of proof of any one element will defeat a finding of liability. A statute may establish a duty or standard of care. Local government units that **fail** to prepare an emergency response plan may be **liable** for injuries caused by the failure to prepare a plan.

Examples

Let's look at a couple of examples.

An emergency responder drives an emergency vehicle in a reckless manner and disregards the safety of all other vehicles. As a result, the response vehicle plows into another vehicle stopped at an intersection. Does this constitute negligence? Let's apply the elements listed above.

1. Was there a duty? Yes, all licensed drivers have a common law duty to drive safely.

2. Was there a failure to carry out the duty? Yes.

3. Was there injury? Yes, to the stopped vehicle.

4. Is there a causal link between Elements 2 and 3? Yes.

5. Is there negligence? Yes.

The Local Emergency Planning Committee (LEPC) and county fail to develop a local emergency response plan, although required by the State Emergency Management Act. A truck overturns, spilling fuming nitric acid. Local response and emergency management units who respond are confused, response efforts are very slow, and the cleanup takes a long time. Many businesses are shut down during the emergency.

Business owners file claims against the county for loss of business during the incident.

1. Was there a duty? Yes, the state law requires planning.

2. Was there a failure to carry out the duty? Yes, there is no local plan.

3. Was there injury? Yes, there was a loss of business income.

4. Is there a causal link between Elements 2 and 3? Apparently.

5. Is there negligence? Probably, if the plaintiffs can convince the courts that the failure to carry out the duty caused the injury.

The second example shows that a claim of negligence is not always cut and dried. The outcome of litigation hinges on which side makes the more convincing case.

Liability

Liability is the state of being liable or legally responsible for something one should do or avoid. Federal, state and local laws exist regarding liability. Federal laws include the Occupational Safety and Health Act, Resource Conservation and Recovery Act (RCRA), and the Superfund

Amendments and Reauthorization Act (SARA) Title III Emergency Planning and Community Right-to-Know Act (EPCRA). State laws vary and may be more stringent than federal law. They cannot be less stringent. Sovereign immunity applied to the collective governments has been increasingly denied over the past several years by legal decisions at all levels of government. There are different kinds of liability. The first is governmental or vicarious liability and the second is individual liability.

Governmental or Vicarious Liability

Most States recognize that the governmental unit is liable for the negligent acts or omissions of its agents or employees, acting within the scope of their duties as public employees. The liability for the employee's actions is passed on to the governmental unit as employer, under a theory normally known as vicarious liability. In the example presented above, the employer may be vicariously liable for an employee's negligence.

The liability of the government agency may be limited, however, in three ways.

First, there is immunity for discretionary actions. This means that a government unit may be immune from liability for employees' actions that are other than normal operational actions. Examples would be actions dependent on judgmental decision-making. The intent is to free public officials from the fear of tort liability if that judgment results in harm to another.

The next form of immunity is governmental/proprietary immunity. This means that some governments distinguish between governmental functions traditionally performed by the government and those functions that are proprietary in nature and are traditionally performed by the private sector. The former group includes activities seen as essential to and traditionally performed by government. Activities such as firefighting and policing fall in this category.

The final way a government's liability is limited is by statutory immunity. This means a state has included specific provisions in its statutes recognizing immunity in tort claims in certain situations. For example, some states recognize immunity for emergency activities. In addition to provisions in the state comprehensive tort liability statute, states also may include provisions in the emergency management act.

Individual Liability

The governmental unit may not be liable for an employee's actions if the employee acts outside the scope of his or her duties, acts with malice, or acts with reckless disregard for the rights of others. Under these circumstances, the employee may be individually liable, and the governmental unit not liable.

Immunity provisions in most state statutes include a provision that protects the acts of employees or representatives of the employer from civil claims except for willful misconduct, gross negligence, or intentional harm to others. Willful or wanton misconduct is that which takes on

the aspect of highly unreasonable actions. It is an extreme departure from ordinary care in which harm or injury is apparent. It involves conduct intended to cause injury to another, but conduct that is more than a mere mistake resulting from inexperience or confusion. It must be more than mere thoughtlessness or inattention.

No doubt the increasing concern over liability and the rise in hazmat responses may make the IC susceptible to a civil claim. However, there are factors that work in the IC's favor. One is the immunity that some state laws provide. But by far the best protection is careful planning and judicious response. The remainder of this course is all about these issues.

Appendix A (Student Manual (SM) p. 1-81) has a more detailed explanation of liability issues.

Summary

Laws

- Federal: Occupational Safety and Health Act, RCRA, EPCRA.
- State statutes.
  - May be more stringent than federal laws, never less.
  - Vary from state to state.
- Local codes and ordinances.
  - May be more stringent than state laws, never less.
  - Vary from locality to locality.

National Fire Protection Association Professional Standards

Have no direct relationship to federal or state laws. Federal and state agencies do reference professional standards when drafting regulations and the standards to contribute to a standard of care.

Sovereign Immunity

The concept that governments cannot be sued unless they agree to be. In recent years, increasingly denied.

Tort

- Acts that harm others for which civil suits can be filed.
- They can occur when one acts or one fails to act.
- Someone suffers harm directly (personal injury) or indirectly (property loss).

Negligence

Unintentional invasion of a person's interest that is protected by law. Four elements must exist to prove negligence:

1. Existence of a duty.
2. Failure to carry out the duty.
3. Actual loss or damage.
4. Causal relationship between the duty and the injury to the third party.

Immunity

Immunity may be granted by a state tort act or the state emergency management act.

If negligence is proved and there is no immunity, the governmental unit may be liable.

If negligence exists, the suit may be filed in state court:

- The governmental unit may be obligated to pay the claim.
- Generally, the employees may not be held responsible.
- There are no punitive fines.

Liability

The state of being liable or legally responsible. The duty or responsibility to:

- Act.
- Provide a service.
- Perform a duty.

Vicarious Liability

The government agency (employer) assumes responsibility for the actions of its officials, employees and volunteers.

The liability of the government agency may be limited by:

- Discretionary immunity.
- Governmental/Proprietary immunity.
- Statutory immunity (state emergency management act).

Individual Liability

This may exist if:

- The actions of the officials, employees and volunteers are considered grossly negligent.
- The actions amount to malfeasance in office.
- A private contractor causes the harm, not the public servant or volunteer.
- The spiller caused the harm, not the responders.

PLANNING

Need for Planning

Major disasters such as the one that occurred in Bhopal, India, which killed 4,000 and injured 200,000 people, are rare. However, hazmat spills and releases have increased in frequency, and problems with hazardous materials have multiplied many times over in the past few years. More chemicals mean more problems when transported, stored or used.

Today there are more than 12 million chemical substances registered with the Chemical Abstract Service (CAS); the total increased by 50,000 per month during the 1980s.

Concern about accidents involving hazardous materials is growing among citizens and public officials. Many people consider hazmat incidents to be the most serious threat facing local jurisdictions. To counteract that threat, federal laws and regulations based on the EPCRA require overall community planning.

Information, an essential component in the planning process, serves to reduce the impact of a hazmat incident. Through a systematic process of reviewing performance of previous incidents, by identifying unsafe practices and implementing policy changes, it is possible to prevent potential injuries at future incidents. The IC must ensure that information about the jurisdiction is complete and accurate; frequent updates keep the information current.

This section deals with preplanning. While the typical IC will not be a part of the planning committee, it is imperative that potential ICs review and critique all aspects of the response plan and forward all comments to the planners.

ICs will be called on to operate within the plan. Should the plan be inaccurate, incomplete, not in compliance with Occupational Safety and Health Administration (OSHA) Title 29, Code of Federal Regulations (29 CFR) 1910.120, or based on impossible goals, the IC must forward needed changes to the plan to those responsible. ICs who accept a faulty plan without comment will have tough questions to answer after an incident. To announce that the incident could not be properly handled because of a faulty plan will place the IC and planners in a bad situation. Also, if actions are taken that do not comply with the regulations, legal actions by injured parties may well result.

This section offers background information about the planning procedures and requirements, not as a complete planning guide. ICs, in some instances, may be members of the LEPC and will be responsible for planning for, as well as responding to, incidents. In any case, ICs should understand where and how the plans came into being, what information they contain, and of what value they may be.

Planning Benefits

Planning provides the IC with knowledge of factors that will have an influence on a hazmat incident. This knowledge includes likely locations and products involved, and the paths of dispersal for released chemicals. A major benefit of this knowledge is that it increases the IC's ability to protect lives, the environment, and property during an incident.

Proper planning procedures, such as those taught in this course and further discussed in the National Response Team's (NRT's) Hazardous Materials Emergency Planning Guide (NRT-1), will identify areas of concern. Finding the hazards the community faces, the risks associated with the hazards, and the jurisdiction's vulnerability to those hazards are primary benefits of the planning process.

Another valuable benefit is that during the planning process, the roles and responsibilities of various agencies that will respond or assist in any way are defined. This reduces confusion and "turf battles" during an incident and increases the efficiency of all responders. Responders must perform their operations while working within an integrated response.

Experience shows that responders on an incident tend to ignore plans prepared by only one agency or one person. Emergency response requires trust, coordination and cooperation among responders. Responders need to know who is responsible for what activities and who is capable of performing what activities. Personal interaction is the way to gain this knowledge. Working together in developing and updating plans offers a prime opportunity for cooperative interaction among responders.

If an incident expands beyond the local capabilities, having a plan that includes mutual-aid agreements will simplify the response of outside assistance.

Adequate plans will identify, and provide assistance to, persons who may become key people on a hazmat incident, whether they come from state or local jurisdictions. During the planning stage, emergency responders, either from the local agencies or from areas with mutual-aid agreements, receive response guidelines. Private companies such as chemical plants, trucking firms, and railroads, that store, transport or use hazardous materials are identified, their personnel training levels are assessed, and their response capabilities are noted.

The Planning Team

EPCRA requires the governor to establish a State Emergency Response Commission (SERC), emergency planning districts, and LEPCs. It also identifies agencies that have a mandatory role in the planning process. Successful planning requires community involvement throughout the process, and enlisting the cooperation of all parties directly concerned with hazardous materials will improve planning. This makes use of the plan more probable and increases the likelihood of an effective response.

The team approach to planning has many benefits. The team brings the expertise of a variety of sources into the process. A team approach increases the accuracy and completeness of the plan and ensures that it reflects the consensus of the entire community. Support for the plan among community leaders, business leaders, and other agencies is more likely if developed through the team approach.

Team members must include the mayor or city manager, the head of county government, or other jurisdiction leaders. Representatives from fire, law enforcement, emergency management, transportation, the media, environmental groups, Emergency Medical Services (EMS), hospitals and health departments or agencies, and industry must be included. Others recommended are representatives from utilities, parks, sanitation, and other community groups or volunteer organizations such as the Red Cross and the Salvation Army.

In selecting the members of the team, one should consider the following factors:

- The members of the group must have the ability, commitment and resources to get the job done. They must have the authority to speak for their agencies.

- They must possess, or have access to, a wide range of expertise relating to the community, its industrial facilities, its transportation system, and the mechanics of emergency response and response planning.

- The members of the group must agree on their purpose and work cooperatively with one another.

- The group must represent all elements of the community that have a substantial interest in reducing the risks posed by hazardous materials. A comprehensive list of potential team members is included in NRT-1 (p. 13).



* Mandated by EPCRA (SARA Title III).

The Role of Local Government

Local governments are the first line of defense at most emergencies and, for several reasons, have a critical role to play in the development of emergency preparedness.

- Local governments have the responsibility to protect public health and safety. Local police and fire departments, for example, are often the lead agencies at responses to hazmat releases.

- Local governments must function as mediators to resolve sometimes competing ideas of different groups involved in planning or response. By clarifying the roles of both planners and responders, local governments help avoid dangerous and costly duplication of efforts and ensure coordination between both public and private agencies.

- Local governments have the authority to raise funds for equipment and personnel required for emergency response. New regulations and ordinances to provide funds for training, equipment and personnel are within the authority of local governments.

Support from both executive and legislative branches of government is essential to successful planning. Government leaders must give adequate authority to those responsible for emergency planning.

Steps In Planning

After the planning team members and leader are assembled, the team has to address several tasks. Completion of all tasks ensures a sound base for the written plan. There are nine basic steps to be taken before beginning any other work; these steps are detailed in NRT-1.

Search Out and Review Existing Plans

Response plans now in use may need only altering to reflect the needs of hazmat incidents. Even plans no longer in use are helpful as a starting point, as any plan will provide the team with information and ideas.

A review of plans ensures proper coordination with other related plans and reduces work efforts by building upon or modifying existing emergency planning and response information. Also, contradiction between plans and the use of redundant plans is avoided.

During the review, planners need to consult organizations such as:

- State and local emergency management agencies.
- State and local environmental agencies.
- State and local transportation agencies.
- State and local public health agencies.
- Fire departments.
- Police departments.
- Public service agencies.
- Volunteer groups, such as the Red Cross.
- Local industry and industrial associations.
- Regional offices of federal agencies, such as the Environmental Protection Agency (EPA) and the Federal Emergency Management Agency (FEMA).

Hazard Analysis

A critical element of hazmat incident planning is a hazard analysis. The information gathered provides the factual basis to set priorities for planning. Also, it provides the documentation for supporting hazmat planning and response efforts.

The three steps used in this process — hazard identification, vulnerability analysis, and risk analysis — have different meanings but sometimes are wrongly used interchangeably. Commonly accepted definitions:

- **Hazard identification**. The identification of the hazardous materials found in the jurisdiction with the **potential** for causing injury to life or damage to property and the environment.

- **Vulnerability analysis**. The **susceptibility** of life, property and the environment to injury or damage if a hazard manifests its full potential.

- **Risk analysis**. The **probability** that injury to life or damage to property and the environment will occur if a hazard manifests its full potential.

Hazard Identification

A complete hazard identification that examines all hazards, vulnerabilities and risks is neither possible nor desirable. The planning team decides the level of thoroughness needed. The focus of the analysis must be on the most common and most severe hazards. A few hazardous materials account for most incidents, and these few are prevalent in most communities. Gasoline and other flammables, plus liquid chlorine, anhydrous ammonia, hydrochloric acid, and sulfuric acid are the chemicals most often involved in incidents. Certain industrial facilities may pose specific additional hazards, such as hydrogen fluoride in oil refineries or large quantities of monomers in plastics manufacturing.

The hazard identification is used to characterize the nature of the problem posed by hazardous materials. The information developed will direct the planning team toward proper community planning.

Proper hazard identification develops information on each facility and transportation situation. It shows the type and quantity of the material either being stored at a facility or being moved on the streets or highways. Identification of storage areas and primary routes of transport occurs. Further, it shows the nature of the hazard most likely to occur during an incident.

Hazard identification is the first step in planning, and planners should complete it before any additional work on the plan begins.

Vulnerability Analysis

The vulnerability analysis identifies what is prone to damage if a hazmat release occurs. It should summarize information on major hazards identified during the hazard identification process.

Planners need to find information on the number of people expected to be in the vulnerable area, as well as whether they are residents, employees of a facility, or others.

Planners also determine both private and public property that faces the possibility of damage. The analysis must include essential systems such as power, water, food, medical services, and transportation corridors and facilities as well as sensitive areas like hospitals, nursing homes, schools, and day care centers.

Finally, planners must determine the extent of the vulnerable zone for a spill or release and the conditions that influence the size of the zone. These conditions include size of the spill, wind direction, weather conditions, water courses, topography, and the like.

Risk Analysis

Risk analysis is an assessment of the probability of injury or damage occurring in the community, as suggested by the vulnerability analysis, because of a release of hazardous materials. Many planning teams use the worst-case scenario to develop a risk analysis. However, describing occurrence probabilities in terms such as low, moderate and high will provide for reasonable estimates if based on the best available information.

The risk analysis will provide the planning team information on:

- The probability that a release will occur.
- Unusual environmental conditions (areas in flood plains are a prime example).
- The type of harm to people — acute, chronic or delayed responses to exposure to hazardous chemicals — and associated high-risk groups.
- The type of damage to property — repairable or permanent.
- The type of environmental damage — classified as recoverable or permanent.

Planners must place emphasis on developing reasonable estimates based on the best available expertise. Two publications can be of help to the planning team. They are “Technical Guidance for Hazard Analysis,” for fixed facilities, and “Emergency Planning for Extremely Hazardous Substances and Chemical Hazard Analysis Procedures,” for transportation. These publications are the combined effort of FEMA, the EPA, and the Department of Transportation (DOT).

Community Resources

After completing the three steps in hazard analysis, the planning team must evaluate the community’s preparedness, prevention, and response resources and capabilities. One begins by identifying all resources, including public, private and volunteer organizations in the survey. Also, planners need to ask about availability of any supplies and buildings the responders might need.

Facility Teams

Many facilities that use hazardous materials have trained response teams, many at the technician level. Some team members are normally on duty at all times. These teams usually will have available a supply of equipment that is compatible with the chemicals on-site.

Transporters

Another community resource available is transporters of hazardous materials or hazardous waste. Planners must determine the equipment available from transporters and their cleanup capabilities and training level status.

Community

Finally, planners must determine the capability of the community's resources and their ability to generate an effective response. It is important to include all local government agencies plus other community resources such as hospitals, public housing, schools, communications, and public utilities. It also is essential to identify possible response personnel, such as fire and police, and determine their level of competency, and also to look for any specialized expertise and response teams.

Roles and Responsibilities

A key purpose of planning is to identify the roles and responsibilities of the various agencies. There are three main reasons for performing this task:

1. It allows for efficient use of all available resources, as the IC knows who is responsible for each action during an incident.

2. It improves coordination among responding units, as there are no turf battles or conflicts over who will perform specific tasks.

3. It provides for overall command of the incident and procedures for changing command as the incident escalates or deescalates.

Normally, the same first responders, such as fire and police, are at the scene of any incident, whatever the hazard. Emergency functions differ only slightly from hazard to hazard. For example, the procedures for warning the public of a massive chemical release are little different from those for warning of an impending tornado or flood.

One can eliminate much confusion and duplication of effort by planning for all hazards, then adding specific annexes for individual hazards. Such hazards include floods, storms, hazmat incidents, and other concerns. (Civil Preparedness Guide (CPG) 1-8, *Guide for the Development of State and Local Emergency Operations Plans*, provides guidance on multiple-hazard plans.)

Features of the Plan

Certain features are essential in any plan. A concept of operations — a brief statement of precisely what is expected to be accomplished if an incident occurs — is critical for each responding organization. It will show the governing principles, roles and responsibilities of all agencies, along with the relationship among agencies.

The plan needs checklists for the responders to use on the scene. These lists will ensure that nothing is forgotten accidentally and will serve as part of the required written documentation of the incident.

The plan must establish standard operating procedures (SOPs) or standard operating guidelines (SOGs). An SOP/SOG offers guidelines that identify the specific actions and methods to be used while handling the incident. An SOP/SOG should be integrated within the employer's emergency response plan and the LEPC plan. The planners and the IC must ensure that integration occurs through review and exercises.

Plan Evaluation

Experience shows that many communities mistakenly presume that writing a plan guarantees adequate preparedness for emergency response. Responders need to evaluate the plan through exercises as soon as possible. Multiagency exercises not only provide an effective means of testing the plan but also provide training for responders. This gives agencies and responders a better understanding of their roles and responsibilities under the new plan. Testing the plan through exercises also reveals its faults and uncovers misunderstandings before they manifest themselves during an incident.

Exercises are most helpful when followed by a meeting of all participants. A debriefing and critique will reveal the strengths and weaknesses of the plan's operations, as well as the performance of those involved. Then planners can amend the plan to correct any deficiencies based on the results of the exercise, review and critique.

LEPC Plan Elements

There are nine elements of planning for hazmat incidents. EPCRA requires that each emergency response plan include at least the following elements. They are in no particular order.

1. Identification of facilities with hazardous chemicals that are within the emergency planning district; identification of routes likely to be used for the transportation of substances on the list of extremely hazardous substances; and identification of additional facilities contributing to, or subjected to, additional risk due to their proximity to facilities such as hospitals or natural gas facilities.

2. Designation of a community emergency coordinator and facility emergency coordinator, who shall make determinations necessary to carry out the plan.

3. A description of emergency equipment and facilities in the community and at each facility in the community subject to Title III requirements, and an identification of the persons responsible for such equipment and facilities.

4. Procedures that provide reliable, effective and timely notification by the facility emergency coordinator and the community emergency coordinator to persons designated in the emergency plan, and to the public, that a release has occurred.

5. Methods for determining the occurrence of a release, and the area or population likely to be affected by such release.

6. Evacuation plans, including provisions for a precautionary evacuation and alternative traffic routes.

7. Training programs, including schedules for training of local emergency response and medical personnel.

8. Procedures to be followed by facility owners and operators and local emergency and medical personnel to respond to any releases of such substances.

9. Methods and schedules for exercising the emergency plan.



*EPCRA states that the LEPC plan shall include "methods and procedures to be followed by facility owners and operators and local emergency and medical personnel to respond to any release of such substance."

Local Emergency Response Plan

The LEPC plan must integrate with the SERC plan. A major task facing the planning team is to integrate new plans into existing plans. It is possible that several plans already exist, and it is essential to coordinate these plans to avoid confusion.

Planners need to start with the SERC plan to make sure state and local plans work together. State plans are available from the SERC upon request. After completion of the local plan, the SERC must review it. Integration of the response and planning components of both the LEPC plan and the SERC plan is essential, and these plans must mesh with agency plans. Agencies include police, fire, and medical services, along with environmental and facility plans. Often, these agency plans are called annexes.

The LEPC plan is the link between the planning and implementation phases and must become part of the incident management system at incident scenes.

Operational Responsibilities

The plan will identify specific operational duties and responsibilities for responders. Assignment of duties during the planning stage gives responders the advantage of knowing exactly what they can expect during a response.

These duties include containment or control of the hazardous material, scene and crowd control, environmental monitoring and sampling, decontamination of contaminated victims and responders, and medical treatment and medical surveillance of victims and response personnel. This is only a partial list. Other duties will become apparent as the plan develops.

Planners must examine facility site-specific emergency response plans, which typically are prepared by facility personnel, for compliance with OSHA regulations. These plans are available to the LEPC upon request. If necessary, the LEPC can recommend changes to the facility plans that bring them into compliance and incorporate them into the LEPC plan.

With facility emergency response plans, the IC can plan responses in more detail than would otherwise be possible. For example, the IC can determine general levels of protection needed and the types of materials necessary by examining chemical lists and chemical data the facility provides. Also, the IC can match chemicals to personal protective equipment (PPE) by consulting a chemical compatibility chart. Note that the EPCRA states that the LEPC plan shall include methods and procedures by facility owners and operators and local emergency response and medical personnel to respond to the release (EPCRA Chapter 16, Section 11003(c)(2)).

Zones

Another critical planning element has to do with zones. To begin, one needs to consider the maximum chemical release possible and the maximum distance contamination might spread. This will help identify the Hot Zone. This is only an initial or preliminary identification, however, and during the incident the commander may, if needed, modify this zone to protect the personnel fully. The rule is that there must be no contamination outside of the Hot Zone. Because of the presence of contamination, specialized protective equipment and clothing are mandatory in the Hot Zone.

Planning also must anticipate two or more decontamination areas. Depending on wind directions and other geographic or climatological factors, the IC will activate one or the other. Decontamination occurs in the Warm Zone. Here, too, depending on the contamination, operating personnel need specialized protective equipment and clothing.

The third zone is the Cold Zone and it is the location of such functions as Command, medical coverage, Staging, and other similar support tasks. In this zone, responders can wear normal work clothes.

There are other names for these zones: the Hot Zone is often called the Exclusion Zone; the Warm Zone, the Contamination Zone; and the Cold Zone, the Support Zone.

Area of Refuge

Related to the concept of the zones is that of the area of refuge. Planning should identify an area of refuge for contaminated victims and contaminated first responders. It is prudent to locate the area of refuge inside the Hot Zone, but close to the perimeter. The reason is that there should be no contamination beyond the Hot Zone. When planning, it will be wise to identify two potential areas of refuge. During the actual operations, based on the same factors that led to the choice of the more suitable Hot Zone, the IC would select the more suitable area of refuge.

In incidents involving large facilities and many employees, the IC may find upon arrival that there are many people in the area of refuge. Planning ahead for this eventuality can help avoid much confusion and will provide for a more rapid decontamination and treatment of victims.

Scene Management

Advance planning also must ensure that the plan provides for a tracking system for all personnel on-scene, especially the entry teams. As in an incident management system, a system of accountability must be in place, including provisions for notifying all responders as **to** whom they are accountable as well as **for** whom they are accountable.

Since entry team members have a limited time to work in the Hot Zone, the plan must set a system in place so that no member exceeds the cumulative limit.

The plan also should locate Staging Areas at strategic locations around the facility, and either name or number them. This simplifies the initial response by having responding units converge at one area and assists backup units in reporting to the proper Staging Area.

Site security and control improve when the responsible agency has planned its response procedures. Roadblocks and other forms of traffic control give responding units easier access to the scene. Provisions to control the public and other sightseers and to maintain a buffer zone between them and the responders are needed. So are provisions for the media by designating a specific point where information will be given regularly.

Facility and Employer Emergency Response Plan

OSHA's 29 CFR 1910.120(q)(1) requires a detailed response plan for each response agency dealing directly with a hazmat emergency. This emergency response plan should contain guidelines describing the management of a hazmat incident. These guidelines, the SOPs/SOGs, identify specific actions for responding agencies.

Each response agency has its own emergency response plan, which must be integrated with the LEPC plan. For response agencies that do not deal directly with a hazmat emergency, the emergency response plan may include the elements listed under "Elements of an Emergency Response Plan," although specific guidelines do not exist for those supporting agencies.

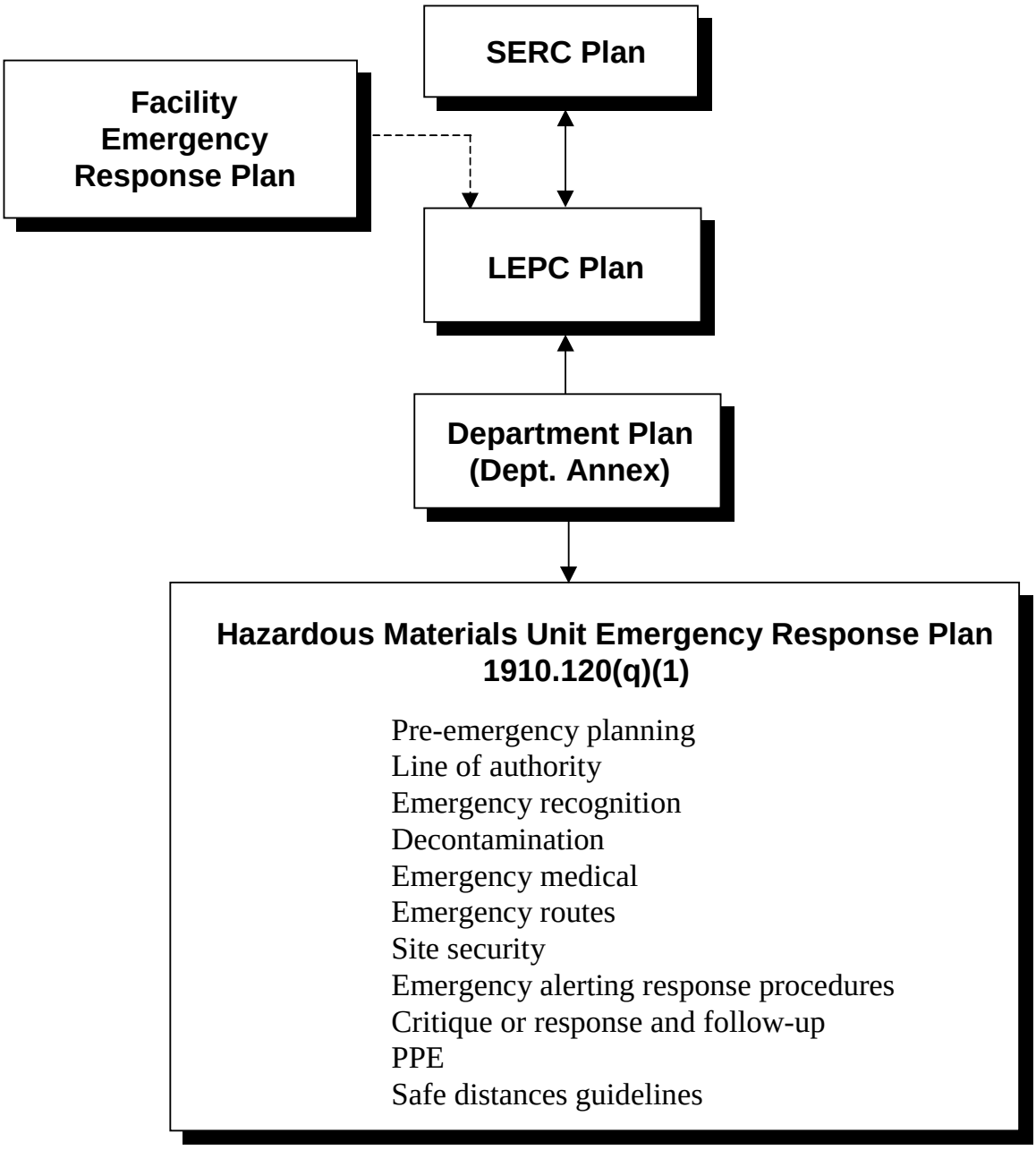
Employers subject to emergency planning requirements also must have an emergency response plan. However, employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from having to develop and implement a plan and making the plan available for inspection if they provide an emergency action plan in accordance with 29 CFR 1910.38(a).

Employers' emergency response plans must address, at a minimum, the following areas, to the extent that they are not addressed elsewhere:

- Pre-emergency planning and coordination with outside parties.
- Personnel roles, lines of authority, training, and communication.
- Emergency recognition and prevention.
- Safe distances and places of refuge.
- Site security and control.
- Evacuation routes and procedures.
- Decontamination.
- Emergency medical treatment and first aid.
- Emergency alerting and response procedures.
- Critique of response and follow-up.
- PPE and emergency equipment.

Emergency response organizations and employers may use the local emergency response plan, the state emergency response plans, or both as part of their emergency response plan to avoid duplication. Those items of the emergency response plan properly addressed by the SARA Title III plans may be included in the agency's or employer's plan or otherwise kept together for the organization's and employees' use.

Public agencies and private employers that are subject to emergency response plan provisions must develop and implement such plans to handle anticipated emergencies and have the plans in place before emergency response operations start. The plan must be in writing, and it must be available for inspection and copying by an organization's employees, their representatives, and OSHA personnel.


SERC Plan
Facility Emergency Response Plan
LEPC Plan
Department Plan (Dept. Annex)
Hazardous Materials Unit Emergency Response Plan 1910.120(q)(1)
Pre-emergency planning
Line of authority
Emergency recognition
Decontamination
Emergency medical
Emergency routes
Site security
Emergency alerting response procedures
Critique or response and follow-up
PPE
Safe distances guidelines

Elements of an Emergency Response Plan

There are many elements that response agencies must address in their emergency response plan:

Law Enforcement

Law enforcement agencies may have responsibility for the following, and must develop an emergency response plan for:

- On-scene coordination.
- Control of emergency access and evacuation routes.
- Site security.
- Crowd control.
- Alerting and notifying the public.
- Performing evacuation.

Fire Service

In most incidents, the fire service is given the task of working in the contamination area. It must develop an emergency response plan describing guidelines for:

- On-scene Command.
- Suppression.
- Containment and control.
- Establishment of zones.
- Site characterization.
- Other functions.

Medical Services

The medical service must list procedures with regard to EMS considerations and protocols for hazmat incidents. EMS emergency response plans may include:

- Gathering information on chemical exposure.
- Measure pre- and post-exposure vital signs and maintaining records.
- Monitoring the health status of responders.
- Monitoring the health status of the public.
- Providing medical treatment at on-site shelters.
- Providing necessary transport to medical facilities.

Environmental

Depending on their capabilities, environmental agencies may perform a wide variety of functions at a hazmat incident. Some tasks performed by these agencies, and for which an emergency response plan must be developed, include:

- Monitoring and analyzing the environment.
- Providing technical guidance and assistance.
- Monitoring cleanup activities.
- Calculating any potential exposures to responders and the public.

Red Cross and Other Volunteer Agencies

Public and private relief agencies offer assistance to persons who have been evacuated from their homes. They provide the basic necessities of life while the incident runs its course. Relief agencies' emergency response plans may include:

- Providing shelter.
- Supplying cots, pillows and blankets.
- Distributing clothing.
- Distributing food.

Regardless of the agency, ensure that an agency's emergency response plan allows that agency to meet its responsibility as outlined in the LEPC plan. In order to determine whether the agency can meet the responsibilities described in the emergency response plan consider three items: personnel to perform the duties, equipment necessary, and adequate training to accomplish the tasks and to comply with OSHA regulations.

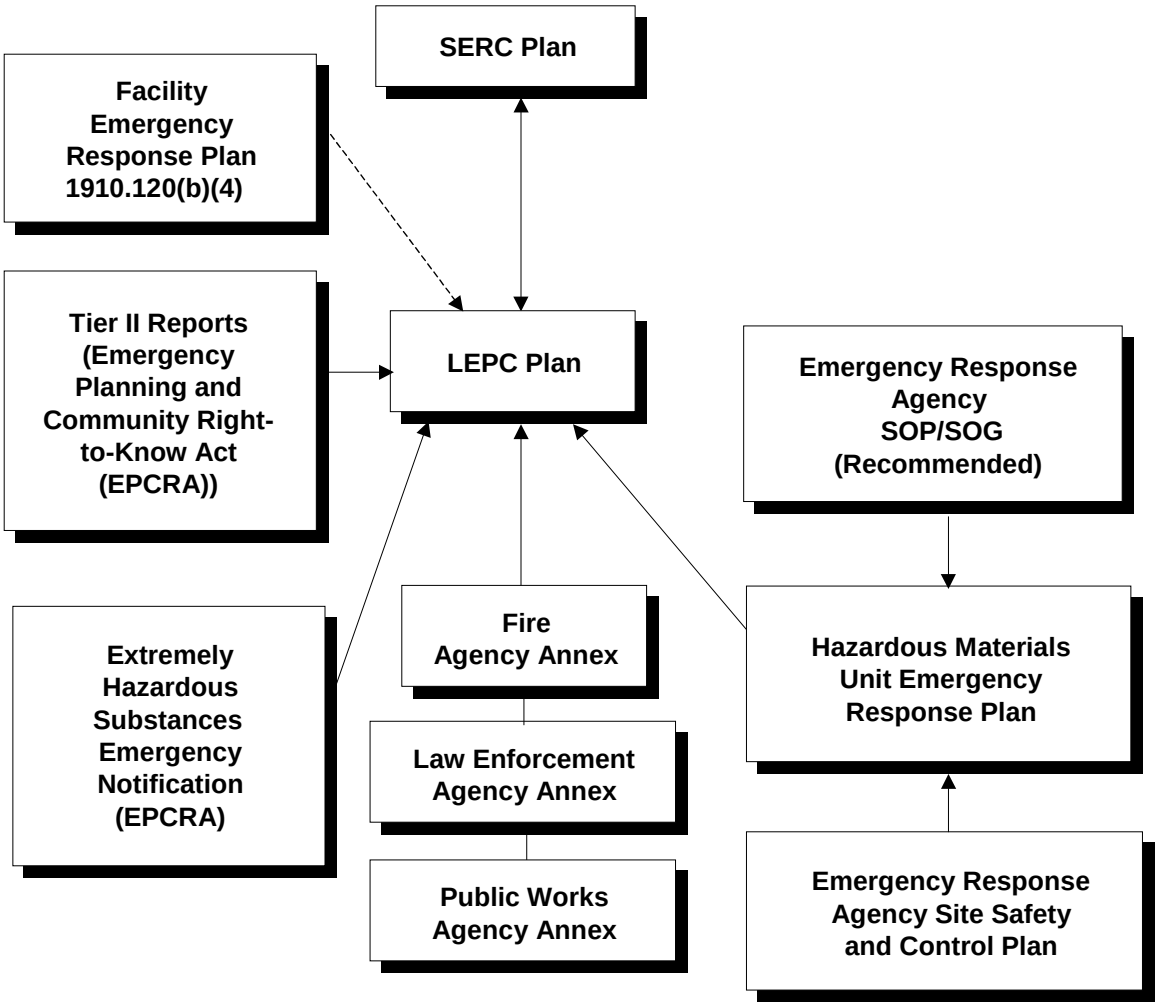
Termination

Termination is an important phase of any hazmat incident and is not to be overlooked. Develop a plan for the orderly termination of and recovery from the incident.

Summary

Personal safety is the foremost concern at any emergency response. This is especially true at hazmat incidents, due to the possibility of widespread areas of a jurisdiction becoming involved and large numbers of responders at the scene. Proper, well-written plans will give the IC guidance for the response. The emergency response plan works to ensure as safe and as effective a response as possible. The emergency response plan is a crucial element of any response and may require much thought and effort. Civil action may be taken against a community that fails to plan and plan effectively.

Remember, while individual ICs may not participate directly in the formulation of plans needed to accomplish the duties within the plan, ICs must review and critique the plan to ensure both familiarity and the ability to operate within the documents' guidelines. Failure to review, critique and exercise plans could expose ICs to legal actions. Considerable fines and other legal actions have been imposed on government entities and individuals under current laws and regulations.



TRAINING

Just as ICs may not be involved in putting together an emergency response plan, they may not have direct involvement in the training of each individual within their organization. More so they will not, in most instances, have direct involvement in the training of other agencies' personnel. However, potential ICs must be aware of the training levels of personnel potentially involved in an incident.

No potential IC (fire department) would ever allow a police officer to attempt a rescue of a trapped civilian at a fire unless that officer was properly trained in the use of all PPE. Consequently, the IC should not allow any firefighter to attempt an operation for which that firefighter has not been properly trained. In an incident involving many personnel from various agencies, all with differing responsibilities, this might seem an impossible task. However, the use of the ICS delegates this responsibility to others within the system, allowing the IC to concentrate on managing the incident.

Training levels for responders must be written into agency plans and the SOP, and the IC should have reviewed this information.

Federal Statutory Requirements

States must follow one of two identical federal regulations for training responders and others who work around hazardous materials or waste: OSHA 29 CFR 1910.120(q) or EPA 40 CFR 311. Amendments to the Superfund Program (Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)) in 1986 (SARA Title I, Section 126) mandate these regulations. The current training status of emergency responders must be assessed before they can take part in a response. The IC is responsible for ensuring compliance with OSHA and EPA regulations.

Required Competency-Based Levels of Training

All responders must receive some level of training. Untrained personnel cannot legally perform functions in the contaminated area, decontamination area, or in the immediate area of the incident.

It is very important to note here that the required training times shown in the regulations are minimums for each level. Because these response levels are competency-based, those competencies and proficiencies are much more critical than mere training hours. The employer has a responsibility to ensure that the responder has the competency. In addition, the employer certifies that the responder is competent and documents that fact.

There are five levels of training mandated in OSHA regulations:

Level	Hours of Training
1. First Responder Awareness	Not specified, objectively show awareness competencies
2. First Responder Operations	8 hours or show competency
3. Hazardous Material Technician	24 hours and show competency
4. Hazardous Material Specialist	24 hours and show competency
5. On-scene IC	24 hours and show competency

Note: Annual refresher training is required of all levels of training.

During the planning stage, someone should review the training level of the various personnel who respond to incidents. The need for both additional training and upgrade training to bring some personnel to a higher level may become apparent. One should not allow a responder to operate at a level higher than that responder's training. For instance, an operations-level responder should not enter the Hot Zone with the intent of plugging, patching or otherwise stopping a leak. This is an offensive action and requires technician-level training. Proper training, preassigned roles and responsibilities, and regular drills make sure available personnel operate properly and safely.

First Responder Awareness Level

First responders at the awareness level are individuals who are likely to witness or discover the release of a hazardous substance. Their primary function is to notify proper authorities that a release has occurred and to start an appropriate response. They also may establish isolation areas and deny entry by inappropriate people.

Personnel at the awareness level must demonstrate competency in recognizing the presence of and identifying the hazardous materials that are involved in an incident. They must understand what hazardous materials are, the risks associated with them during an incident, what the potential results may be, and the risks created by an incident. They also must understand their role in the emergency response plan and be able to recognize the need for additional resources and include this information in notifications.

First Responder Operations Level

First responders at the operations level are part of the initial response aimed at protecting people, property and the environment during a hazmat release. They function in a defensive mode. Their function is to contain the release (keep it from spreading) from a safe distance and to prevent exposures without trying to stop the release. This group typically includes all firefighters and may also include emergency medical personnel, police officers, and private sector employees, depending on the duties the individuals must perform. First responders at the operations level must be familiar with the emergency operations plan under which they operate and be able to function within their employers' command system.

Defensive actions involve notification and possible evacuation, but not plugging, patching or cleanup of spilled or leaking materials. Appropriate actions include but are not limited to:

- Fire suppression.
- Elimination of ignition sources.
- Vapor suppression.
- Diking or diverting to keep a release to a confined area.
- Stopping the release if it can be done from remote shut-offs.

Operations personnel receive training in basic hazard and risk assessment techniques, the selection and use of appropriate PPE provided them by the employer, and a basic understanding of hazmat terms. They are trained in defensive operations using the resources and equipment available to them. They get a thorough explanation of all SOPs. Operations-level employees may perform decontamination if they receive proper training and are equipped to perform this function.

Hazardous Materials Technician

Hazardous materials technicians are personnel who respond to releases or potential releases in order to stop the release. They assume a more aggressive (offensive) mode of operation than first responders at the operations level. They may approach the release to try to plug, patch or in another fashion stop it. Training includes the use of appropriate chemical protective clothing.

Technicians must know how to carry out the emergency response plan, how to function within the ICS, and basic termination procedures. They must be able to classify, identify and verify known and unknown hazardous materials by using monitoring equipment and other survey instruments. Technicians must be able to select and use the proper PPE provided and to understand and begin proper decontamination procedures. Technicians must further have an understanding and knowledge of basic chemical and toxicological terminology and behavior.

Hazardous Materials Specialist

Hazardous materials specialists perform activities similar to those of the technician, except that the specialists' responsibilities require a greater depth of knowledge of the substances involved. The specialist may act as the liaison for federal, state and local governmental authorities regarding site activities.

This group of responders includes personnel who are hazmat team leaders/officers or specialized industrial response personnel.

It is important to note that the definitions of technician and specialist are not clearly defined and some overlapping occurs, depending on who is interpreting the regulation.

On-Scene Incident Commander

ICs assume control of the incident scene beyond the first responder. Normally, this individual is a fire chief, police officer, or plant safety manager representing the lead response agency.

This class of responder includes all personnel who may fill the Command position at sometime during the emergency. A first responder may act as the initial IC, but the initiation of a multilevel ICS is the domain of the person at IC level.

ICs will have received 24 hours of training at the operations level and in addition will have knowledge and abilities to carry out their employer's ICS and emergency response plan. In addition, ICs must have an understanding of the hazards and risks associated with operations conducted in chemical protective clothing, as well as knowledge of the importance of proper decontamination procedures. They will be aware of the state emergency response plan and of the National Response Framework (NRF).

Refresher Training

Any employee trained to any of the five levels must receive annual refresher training extensive enough to maintain a level of competency. The employer may choose to have responders demonstrate their competencies rather than attend a formal refresher course. In any case, the employer must maintain records of the methods used to demonstrate this competency.

Cleanup Operations

If, after completion of the emergency response phase of the operation, hazardous substances or health hazards such as contaminated soil or other materials need removal, the employer conducting the cleanup activities must follow all regulations. These regulations address the health and safety of the cleanup personnel, not the actual labeling, transportation, treatment or disposal of the contaminated items.

The IC is responsible for oversight of the post-emergency response until the scene is turned over to an appropriate authority such as an environmental agency, a contractor, or the facility. When the spilled material is on a private employer's property, and plant or workplace employees engage in the cleanup work, many guidelines come into play. Employees must be trained following 29 CFR 1910.38(a), 1910.139 and 1910.1200. In addition, they must have received the needed safety and health training made necessary by the hazards of the chemicals they may encounter, the tasks they are to perform, and the PPE they will wear.

Following good safety practices and regulations, a qualified individual should inspect all equipment before use. Only if it is in serviceable condition should it be used.

Confined Space Entry Training

Confined spaces are defined by OSHA (29 CFR 146) as those spaces:

- Containing or having the potential to contain a hazardous atmosphere.
- Containing a material that has the potential for engulfment.
- Having an internal configuration such that a person could be trapped or become asphyxiated.
- Containing a serious safety or health hazard.
- Not designed for continuous human habitation.
- Having an opening large enough to allow a person to enter.

Responders entering confined spaces need proper training that follows the regulation. Training consists of monitoring, safety and entry techniques, and rescue of victims.

One of the provisions of the regulation allows industries to train employees in the entry techniques only, not in rescue. This is left to the local fire department in many cases. ICs must anticipate and train for rescue of downed employees inside confined spaces.

National Fire Protection Association Professional Standards

The National Fire Protection Association (NFPA) standards are not regulations but are consensus standards. Representatives of specific areas of concern develop consensus standards to give definitive guidance on proper actions for response. Although they are not mandatory, consensus standards represent appropriate behavior and competency as viewed by representative members of the profession. These standards explain "how the job is to be done." In short, they provide a standard of care.

If one is involved in a legal or civil action as a result of actions at a hazmat incident, one will be judged by both mandated regulations and consensus standards.

There are two relevant NFPA consensus standards.

NFPA 472*, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*.

Generated by the NFPA Technical Committee on Hazardous Materials, it establishes specific knowledge and competence levels for response personnel and classifies response personnel into the levels previously discussed. The levels include first responder awareness, first responder operational, hazardous materials technician, the IC, and off-site specialist employees.

NFPA 473*, Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents*.

This standard addresses the specific competencies needed by EMS personnel for the management of responders and victims at hazmat incidents. Again, this standard is set up in a fashion similar to other NFPA standards.

Training Resources

Federal

Various governmental regulations not only mandate training for hazmat responders, but some federal entities also provide training resources. EPA's SARA Title I, Section 126 mandates that responders train for hazmat situations.

SARA Title III makes funds available for this training. FEMA makes some training available through its training facilities of which the National Fire Academy (NFA) is a part. Other departments or agencies also make some training available. The Department of Labor, OSHA, DOT, and other federal agencies have training available to response personnel. A complete guide to available federal training is the "Digest of Federal Training in Hazardous Materials" (FEMA 134).

State

In most instances, two state agencies will have the lead in providing training for responders to hazmat incidents. They are the state fire training academy and the state office of emergency services. Funds are available for both planning and training from the Hazardous Materials Transportation Uniform Safety Act (HMTUSA) of 1990 (Hazardous Materials Transportation Act (HMTA) as amended). Training grant money is available on the state level from SARA Title III, Section 305a.

One can check with the governor's office or the SERC for the availability and the appropriate state agency to contact for training or planning funds.

Liability Under OSHA and EPA Regulations

If a public employer or emergency response organization fails to comply with the applicable requirements of these federal laws and regulations governing hazmat response plans and incidents, OSHA and EPA may levy fines or penalties against the governmental unit. These federal requirements impose obligations on the employer but do not provide for civil remedies against first responders or public officials.

SUMMARY

Common sense and federal regulations both require that all responders be trained to perform their assigned roles and responsibilities, and ICs are reminded to follow these guides. OSHA and EPA have published guidelines describing the competencies needed to perform various duties safely while responding to hazmat incidents. NFPA has produced consensus standards that specifically describe response competencies and actions. ICs would do well to remember and follow these guides. Failure to do so could lead to litigation and penalties. Worse yet, such negligence could lead to loss of life, something every IC must work to prevent.

ACTIVITIES

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Activity 1.1

Tunnel Fire

Purpose

To practice determining objectives in a hazmat incident.

Directions

1. The instructor will divide the class into four or five groups.
2. You will receive a situational briefing on the tunnel fire incident.
3. Identify how your group will approach the incident and set the objectives.
4. Identify a representative, and prepare your group's response.
5. Introduce your group to the class prior to presenting your group's response.

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Activity 1.2

Identifying Liability Issues in Selected Actions

Purpose

To practice the identification of potential liability issues.

Directions

1. Work in your small groups. Use the list of strategies and tactics from Activity 1.1.

2. List any liability concerns that your group may have with the selected tactics and strategies.

3. Decide how the liability issues could be reduced or mitigated.

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Activity 1.3

Occupational Safety and Health Administration as a Standard of Care

Purpose

To familiarize yourself with the specific items of paragraph (q) of 1910.120 titled Emergency Response to Hazardous Substance Releases.

Directions

1. The instructor will divide you into five groups.

2. The instructor will assign your group one of the five groups of paragraph (q) items.

   a. Group 1:
   (q)
   (q)(3)(iii)
   (q)(3)(viii)
   (q)(6) and (q)(6)(i)
   (q)(7)

   b. Group 2:
   (q)(1)
   (q)(3)(iv)
   (q)(3)(ix)
   (q)(6)(ii)
   (q)(8)

   c. Group 3:
   (q)(2)
   (q)(3)(v)
   (q)(3)(x)
   (q)(6)(iii)
   (q)(9)

   d. Group 4:
   (q)(3)(i)
   (q)(3)(vi)
   (q)(4)
   (q)(6)(iv)
   (q)(10)

e. Group 5:
(q)(3)(ii)
(q)(3)(vii)
(q)(5)
(q)(6 (v)
(q)(11)

3. Your group will have 20 minutes to read, discuss and prepare to inform the class on the elements you were assigned.

4. Select a separate representative to explain to the class each of the items assigned to your group.

Activity 1.4

Training Assessment

Purpose

To assess your understanding of the training requirements of OSHA's Hazardous Materials Emergency Response standard.

Directions

1. Read the following scenarios, and answer the questions that follow each one.

2. In your small groups, discuss your answers to the questions presented in each case problem. Prepare a brief response to the questions for each case. Be prepared to discuss your answers with the class.

3. You have 20 minutes for group work.

4. In each case, consider your group a "Board of Inquiry" whose duty it is to assess deficiencies and document them according to 29 CFR 1910.120.

Scenario 1

City dispatch receives a call for an individual with "trouble breathing." Rescue Squad 1 (an advanced life support (ALS) unit) is dispatched with Capt. Smith and paramedics Jones and Roberts on board. Upon arrival, Capt. Smith observes a whitish cloud escaping from the pump/filtration room at the rear of the local community swimming pool. The vapor is being dispersed as it leaves the building, but the prevailing wind is blowing directly toward the address to which the unit is being dispatched. Capt. Smith leaves the unit and immediately develops the following symptoms: burning sensation in his chest, eyes watering, and mucous membranes beginning to burn and produce liquid. He immediately returns to the rescue vehicle and the unit backs away. He requests two additional companies, a chief and a hazmat unit through city dispatch. Engine 1 and Engine 2 respond with Lts. Murphy and Sanchez and three personnel on each of the units. Upon arrival, Engine 1 members don full turnout clothing, including self-contained breathing apparatus (SCBA). Lt. Sanchez and two firefighters enter the address and remove an unconscious civilian to the Rescue Squad located 500 feet away. Lt. Murphy and two firefighters also don full turnouts and SCBA. They enter the address and make a secondary search. They return to the Rescue Squad and report that no other occupants were found. The victim is treated during this time.

Questions

1. Who should be the IC? _____

2. Were the responders "demonstrating competency" according to 29 CFR 1910.120 (40 CFR 311), and where, if ever, did they violate this regulation? _____

Scenario 2

State Police Officer Smith is dispatched to a vehicle accident in a remote section of the community. Upon arrival, the officer finds that a car with one occupant has struck a DOT 406 cargo tank between the tractor and the rear wheels, shearing off the piping. Liquid is on the automobile and on the ground surrounding the vehicle. Officer Smith notices a DOT placard with the number 2209 (formaldehyde). The truck driver and occupant of the automobile are in their respective vehicles and appear unresponsive. Officer Smith first removes the occupant of the car. He then returns and removes the driver of the truck to an area upwind and uphill of the incident. Officer Smith requests an ambulance for the two injured parties and a fire company for a possible fire. The officer notifies the dispatcher that this may be a hazmat incident.

Questions

1. Did Officer Smith "demonstrate competency" according to 29 CFR 1910.120? _____

2. By removing the occupants, did Officer Smith incur personal liability? _____

Scenario 3

Engine 14 responds to a dumpster fire behind the local supermarket. Upon arrival, Lt. Smith observes that a brilliant white fire with dense white smoke has enveloped the dumpster completely. Its walls are glowing red. Lt. Smith orders the heavy caliber deck gun trained on the dumpster. He then orders the nozzle placed into a wide fog pattern and the 1,000-gallon booster tank used as water supply. Upon application of water, an explosion occurs. The concussion shatters windows in the surrounding stores and rips a hole in the dumpster. Lt. Smith requests an additional engine company to respond and to supply water from a nearby hydrant.

With the water supply established by Engine 21, Engine 14 continues to apply water to the dumpster. Several additional explosions occur, but the fire finally is extinguished with 22,000 gallons of water. The parking lot where the dumpster is located has runoff 3 inches deep over most of its 1,000-by-2,000-foot surface. The water is draining slowly into a storm sewer.

Lt. Smith orders two firefighters in full turnouts with SCBAs to overhaul the dumpster. Satisfied that the fire is out, Engines 21 and 14 leave the scene to a police officer to secure.

Questions

1. Did Lt. Smith act properly? _____

2. What facts in this situation suggested that this was not a "normal" fire? _____

3. Were the actions of the fire unit during the incident at the "operations level"? _____

Scenario 4

During an annual fire department inspection of a warehouse, Codes Inspector Gordon notices that a supply closet is in poor order. A small metal can containing yellow crystals and labeled chromic acid has fallen off the shelf, and its contents are scattered over the floor.

Inspector Gordon shows this to the warehouse manager who is accompanying him. The manager calls a member of the maintenance staff who immediately sweeps up the crystals and removes them from the area, depositing them in the outside trash cans. Inspector Gordon and the warehouse manager continue the inspection.

Questions

1. Did Inspector Gordon act appropriately? _____

2. What level of hazmat training should the inspector have completed? _____

3. If the maintenance staff member suffers side effects from the cleanup of this incident, who is legally responsible for the medical bills, lost work time, personal suffering?

NOTE-TAKING GUIDE

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NOTE-TAKING GUIDE

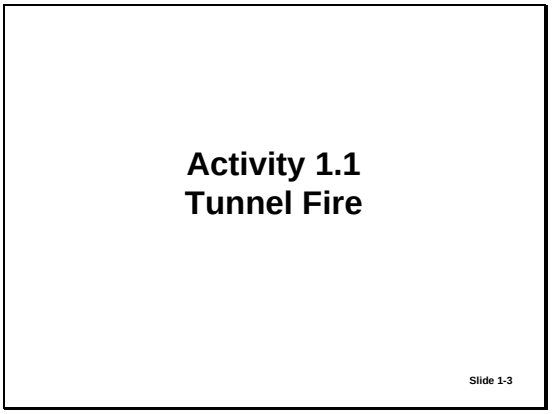
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ACTIVITY 1.1 INSTRUCTIONS

- **Assemble into groups.**
- **Receive a situational briefing on the incident.**
- **Identify how your group will approach the incident and set the strategies and tactics.**
- **Identify a representative and prepare your group's response.**
- **Introduce your group to the class.**

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TERMINAL OBJECTIVES

The students will be able to:

- **Explain the components of the standard of care and their implications for hazardous materials/ weapons of mass destruction (hazmat/WMD) response.**
- **Explain the potential civil and criminal liability implications for the Incident Commander (IC) and other emergency responders during a hazmat/WMD incident.**

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ENABLING OBJECTIVES

The students will:

- **Define standard of care.**
- **Differentiate among laws, regulations and standards.**
- **Identify the legislative and regulatory basis for the hazmat/WMD standard of care.**
- **Identify the three primary National Fire Protection Association (NFPA) standards that establish the basis for the hazmat/WMD emergency response.**

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ENABLING OBJECTIVES (cont'd)

- **Describe how using the National Incident Management System (NIMS)-compliant Incident Action Plans (IAPs), adhering to the standard of care, fully documenting decisions, and other actions can reduce their liability exposure.**

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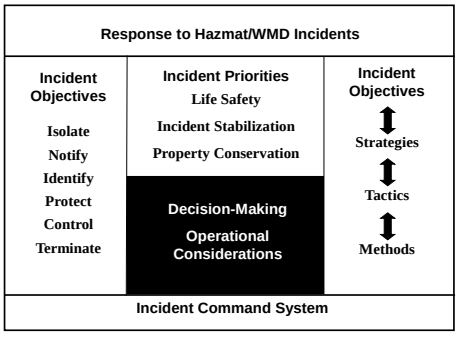


ENABLING OBJECTIVES (cont'd)

- **Identify the following terms and their implications as they relate to hazmat/ WMD response: sovereign immunity, negligence, gross negligence, intentional misconduct (malfeasance), tort, vicarious liability, and individual liability.**

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INCREASING CONCERN ABOUT LEGAL IMPLICATIONS AND LAWSUITS

Litigious trend in the United States

- **Looking for others to blame**
- **Lack of personal responsibility**
- **Affects personal financial security**
- **Risk for responders**
- **General trend toward a litigious society**



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LIABILITY

The duty or responsibility to act, provide a service, or perform a duty

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TYPES OF LIABILITY

Vicarious	Individual
Governmental unit is liable for the negligent acts or omissions of its agents or employees (outside the standard of care).	**Governmental units may not be liable for an employee's actions if the actions:** • **Are outside the scope of duties.** • **Involve malice.** • **Show reckless disregard.**

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TYPES OF NEGLIGENCE

Negligence	Gross Negligence
The unintentional invasion of a person's interest protected by law.	**The intentional invasion of a person's interest protected by law.**

- **Actor is at fault.**
- **Actor's conduct is the legal cause of the injury suffered.**

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FOUR ELEMENTS OF NEGLIGENCE

1. **Duty**
2. **Failure to carry out duty**
3. **Actual loss or damage to the injured party**
4. **Causal connection between the act of the wrongdoer and a resulting injury**

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MALFEASANCE

- **Willful misconduct — gross negligence**
- **Intentional acts to harm others**
- **Conduct departing from usual standard, including employer's emergency response plan or operational procedures**

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TORT

An act that occurs when a person commits an act, or fails to act, without right, and as a result another is harmed, directly or indirectly

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SOVEREIGN IMMUNITY

- **The protection a government unit has against individuals, unless the unit agrees to pay the claims**
- **Is lost by gross negligence, malfeasance, those responsible for the incident, or private contractors**

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REGULATORY ENFORCEMENT VERSUS CIVIL OR CRIMINAL ACTIONS

Regulatory enforcement:
Citations by enforcement agencies — Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), etc.

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OSHA ENFORCEMENT

- **Technical violation — minor violation with minimal potential for harm**
- **Serious violation — substantial probability that death or serious physical harm could result, and the employer knew or should have known of the hazard**
- **Willful violation — intentional disregard or plain indifference**

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NEGOTIATED FINES AND VOLUNTARY COMPLIANCE

- **Negotiation of citations and fines**
- **Often in the form of a hearing**
- **May eliminate fines if steps are taken to correct violations**

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REGULATORY ENFORCEMENT VERSUS CIVIL OR CRIMINAL ACTIONS

Civil actions:

- **Most probable**
- **May include regulatory enforcement resulting in fines levied by enforcement agency**
- **Civil proceedings**
- **Most commonly results in monetary awards to plaintiff**

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REGULATORY ENFORCEMENT VERSUS CIVIL OR CRIMINAL ACTIONS (cont'd)

Criminal actions:
- **Filing of criminal charges**
- **Generally involves willful acts**
- **Least probable**
- **Could result in fines or imprisonment**

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REDUCING LIABILITY EXPOSURE

- **Act in good faith**
- **Act reasonably**
- **Document time and actions**
- **Maintain competencies**
- **Follow standard of care**

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Activity 1.2
Identifying Liability Issues in Selected Actions

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FIRES THAT CAUSED REGULATORY CHANGE

- **Great Chicago fire**
- **Baltimore City fire**
- **Triangle Shirtwaist fire**
- **Our Lady of the Angels fire**

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HAZARDOUS MATERIALS EVENTS THAT CAUSED REGULATORY CHANGE

- **MV Torrey Canyon**
- **Valley of the Drums**
- **Bhopal, India**

And there are many other examples

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TERRORISM INCIDENTS THAT CAUSED REGULATORY CHANGE

- **1993: World Trade Center bombing**
- **1995: Murrah Federal Building bombing**
- **1995: Tokyo, Japan, sarin subway attack**
- **2001: al-Qaida terrorist attacks (9/11)**

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STANDARD OF CARE

Agencies:
- **Department of Transportation (DOT)**
- **OSHA**
- **EPA**
- **Department of Homeland Security (DHS)**

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STANDARD OF CARE (cont'd)

Regulatory definitions:
- **Hazardous materials (DOT)**
- **Hazardous substances (OSHA, EPA)**
- **Hazardous wastes (EPA)**
- **Extremely hazardous substances (EPA)**
- **Transportation security (DHS)**

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STANDARD OF CARE (cont'd)

The level of competency anticipated or mandated in the provision of a service or a duty



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STANDARD OF CARE (cont'd)

- **Dynamic**
- **Legal implications**
- **Influenced by:**
  - **Knowledge and experience**
  - **Laws**
  - **Regulations**
  - **Standards**
  - **Guidance documents**
  - **Court decisions**

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LEGISLATIVE BASIS

- **Clean Water Act (CWA) of 1970**
- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980**
- **Superfund Amendments and Reauthorization Act (SARA) of 1986**

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LEGISLATIVE BASIS (cont'd)

- **Hazardous Materials Transportation Uniform Safety Act (HMTUSA) of 1990**
- **Clean Air Act (CAA) of 1990**
- **USA Patriot Act of 2001**

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LEGISLATIVE BASIS (cont'd)

CWA of 1970 and amendments established federal role in environmental emergencies:

- **National Response System (NRS)**
- **National Oil and Hazardous Substances Pollution Contingency Plan (NCP)**
- **National Response Team (NRT)**
- **Regional Response Teams (RRTs)**

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RESOURCE CONSERVATION AND RECOVERY ACT OF 1976

- **Mandated hazardous waste trucking**
- **"Cradle-to-grave" power**
- **Toxic waste disposal facility**
- **Facility licensing and permitting**

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LEGISLATIVE BASIS (cont'd)

CERCLA:

- **Created "Superfund"**
- **Expanded role of NRT**
- **Placed additional emphasis on emergency response**
- **Established "the spiller pays" principle**

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LEGISLATIVE BASIS (cont'd)

SARA — four sections known as titles:
- **Title I — response and liability provisions**
- **Title II — miscellaneous hazardous waste provisions**
- **Title III — Emergency Planning and Community Right-to-Know Act (EPCRA)**
- **Title IV — Radon Gas and Indoor Air Quality Research**

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LEGISLATIVE BASIS (cont'd)

- **Title I — Section 126**
  - **OSHA and EPA training and safety regulations**
- **Title III — EPCRA**
  - **Planning and reporting requirement**
  - **Airborne releases of extremely hazardous substances only**
  - **Facility identification and planning**

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LEGISLATIVE BASIS (cont'd)

USA Patriot Act
- **Public Law 107-56**
- **Provides tools required to intercept and obstruct terrorism**
- **Title 18, Section 2332a**

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LEGISLATIVE BASIS (cont'd)

HMTUSA

- **Now called Hazardous Materials Transport Act (HMTA)**
- **Integrates U.S. with international requirements**
- **Hazard class/division system, packaging**
- **Placarding, labeling**
- **Commercial driver's hazmat licensing**
- **Planning and training funding mechanism**
- **Hazardous Materials Emergency Preparedness (HMEP) national curriculum guidelines**

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LEGISLATIVE BASIS (cont'd)

CAA of 1990

- **Amends previous CAA**
- **Provides new federal focus on chemical accident prevention**
- **Complements Title III and OSHA 1910.119 (Process Safety Management (PSM))**
- **Involves development of Risk Management Plans (RMPs)**

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CODE OF FEDERAL REGULATIONS

Code of Federal Regulations (CFR) has 50 sections, called titles:

- **7 — Agriculture**
- **10 — Energy**
- **14 — Aeronautics and space**
- **29 — Labor (OSHA)**
- **33 — Navigation and navigable waters**
- **40 — EPA**
- **42 — Public health**
- **44 — Emergency management**
- **46 — Shipping**
- **49 — DOT (Transportation)**

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REGULATORY BASIS

- **Not a law, but authorized by law**
- **Follows standard promulgation process**
- **When final, they are the enforcement tool for a law**

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REGULATORY BASIS 40 CFR

40 CFR 300, NCP

- **Mechanism for handling chemical emergencies**
- **Includes all NRT activities**
  - **National Response Center (NRC)**
  - **RRTs**
  - **Federal On-Scene Coordinator (OSC)**
  - **Technical support**

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REGULATORY BASIS 40 CFR (cont'd)

40 CFR 68 — Risk Management Planning (RMP)

- **Identifies substances covered**
- **Off-site consequence scenarios**
- **Develops prevention and emergency response program**
- **Overall management for implementation**

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REGULATORY BASIS 40 CFR (cont'd)

40 CFR 310 — Emergency Response Financial Restitution

- **Up to $25,000 restitution**
- **Only if all other avenues of collection fail**
- **Local Emergency Planning Committee (LEPC), State Emergency Response Commission (SERC), and SARA compliance**
- **Requires proper notification and documentation**

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REGULATORY BASIS 40 CFR (cont'd)

40 CFR 311 — Hazardous Waste Operations and Emergency Response (HAZWOPER)

- **EPA's version of HAZWOPER**
- **Defines who is an employee**
- **Refers to 29 CFR 1910.120**

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REGULATORY BASIS 40 CFR (cont'd)

40 CFR 355 et al. — EPCRA planning requirements

- **Places SARA Title III requirements in the form of regulations**
- **Routinely called EPCRA by various governmental and business concerns**

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STANDARD OF CARE

- **EPA 311 and OSHA 1910.120**
- **NFPA standards**
  - **NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents***
  - **NFPA 473, *Standard for Competencies for EMS Personnel Responding to Hazardous Materials/ Weapons of Mass Destruction Incidents***
- **Organization's standard operating procedures (SOPs) or standard operating guidelines (SOGs)**

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29 CFR 1910.120

- **Final rule effective March 1989**
- **Contains 17 paragraphs**
- **Contains five appendices**
- **EPA adopted this OSHA regulation as its standard of care for emergency response to hazmat incidents**

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ELEMENTS OF 29 CFR 1910.120 SCOPE, APPLICATION, DEFINITIONS

Scope — This section covers the following operations, unless the employer can demonstrate that the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety and health hazards.

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1910.120 CHAPTERS

- **Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard (a)(1)(v).**
- **Does this sound like a first responder?**

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1910.120 CHAPTERS (cont'd)

- **Safety and health program (b)**
- **Site characterization and analysis (c)**
- **Site control (d)**
- **Training (e)**

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1910.120 CHAPTERS (cont'd)

Medical surveillance (f):

- **General: Employees engaged in operations specified in paragraphs (q)(9) shall institute a medical surveillance program in accordance with this paragraph.**

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1910.120 CHAPTERS (cont'd)

1910.120(q)(9) medical surveillance and consultation:

- **Members of an organized and designated hazmat team and hazmat specialist shall receive a baseline physical examination and be provided with medical surveillance as required in paragraph (f) of this section.**

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1910.120 CHAPTERS (cont'd)

- **Engineering controls, work practices, and personal protection equipment for employee protection (g)**
- **Monitoring (h)**
- **Handling drums and containers (i)**

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1910.120 CHAPTERS (cont'd)

- **Opening drums and containers (j)**
- **Decontamination (k)**
- **Emergency response by employees at an uncontrolled hazardous waste site (l) (This is not for emergency responders.)**

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1910.120 CHAPTERS (cont'd)

- **Illumination (m)**
- **Nonpotable water (n)**
- **New technology programs (o)**
- **Certain operations conducted under the Resource Conservation and Recovery Act (RCRA) of 1976 (p)**

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1910.120 CHAPTERS (cont'd)

- **Emergency response program to hazardous substance release (q).**
- **This paragraph is intended for emergency response personnel (such as Emergency Medical Services (EMS), fire, law enforcement, public works, sanitation workers, and others) who, as part of their normal assignments, may become involved with a released hazardous substance.**

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1910.120 APPENDICES

- **Personal protective equipment (PPE) test methods (A)**
- **General description and discussion of the levels of protection and protective gear (B)**
- **Compliance guidelines (C)**
- **References (D)**
- **Training curriculum guidelines (nonmandatory) (E)**

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1910.120 INTERPRETATIONS

- **While the standard has not changed since 1989, its interpretation changes on a regular basis.**
- **Interpretations include items such as:**
  – What level of training certain responders must receive.
  – What operations level responders are permitted to perform — such as gasoline spills.

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APPENDIX E: TRAINING CURRICULUM GUIDELINES

- **The guidance is nonmandatory and may be used for assistance in developing site-specific training curriculum to meet the training requirements of 29 CFR 1910.120 (q)(6), (q)(7), and (q)(8).**
- **The three sections of (q) apply to first responders.**

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Activity 1.3 Occupational Safety and Health Administration as a Standard of Care

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ACTIVITY 1.3 (cont'd)

- **(q) Emergency response to hazardous substances**
- **(q)(1) Emergency response plan**
- **(q)(2) Emergency response plan elements**
- **(q)(3)(i) Emergency response procedures**
- **(q)(3)(ii) Emergency response procedures**

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ACTIVITY 1.3 (cont'd)

- **(q)(3)(iii) Emergency response procedures**
- **(q)(3)(iv) Emergency response procedures**
- **(q)(3)(v) Emergency response procedures**
- **(q)(3)(vi) Emergency response procedures**

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ACTIVITY 1.3 (cont'd)

- **(q)(3)(vii) Emergency response procedures**
- **(q)(3)(viii) Emergency response procedures**
- **(q)(3)(ix) Emergency response procedures**
- **(q)(3)(x) Emergency response procedures**
- **(q)(4) Skilled support personnel**

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ACTIVITY 1.3 (cont'd)

- **(q)(5) Skilled support personnel**
- **(q)(6) and (q)(6)(i) Training and awareness level**
- **(q)(6)(ii) Training operations level**
- **(q)(6)(iii) Training technician level**

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ACTIVITY 1.3 (cont'd)

- **(q)(6)(iv) Training specialist level**
- **(q)(6)(v) Training on-scene IC**
- **(q)(7) Trainers**
- **(q)(8) Refresher training**

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ACTIVITY 1.3 (cont'd)

- **(q)(9) Medical surveillance and consultation**
- **(q)(10) Chemical protective clothing**
- **(q)(11) Post-emergency response operations**

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CONSENSUS STANDARDS

- **Standards such as NFPA.**
- **Not mandatory or binding unless authority having jurisdiction (AHJ) adopts them. AHJ can adopt part or all of the standards.**
- **First responders should conduct their actions within the standard of care.**
- **Courts often use NFPA standards as a standard of care.**

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NATIONAL FIRE PROTECTION ASSOCIATION 471

NFPA 471, *Recommended Practice for Responding to Hazardous Materials Incidents*

- **Covered basic response practices and procedures**
- **Material was generic**
- **Material was good reference when developing SOPs or SOGs**
- **Currently under revision and may be expanded to include team organization**

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NATIONAL FIRE PROTECTION ASSOCIATION 472

- **List of competencies for response at various levels of capability and incident scene responsibility**
- **Revised and updated on a regular basis**

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NATIONAL FIRE PROTECTION ASSOCIATION 472 (cont'd)

- **Fifteen chapters**
- **Eight Annex chapters**
- **Chapter 1: Administration**
- **Chapter 2: Reference Publications**

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NATIONAL FIRE PROTECTION ASSOCIATION 472 (cont'd)

- **Chapter 3: Definitions**
- **Chapter 4: Competencies for Awareness Level Personnel**
- **Chapter 5: Competencies for Operations Level Personnel**
- **Chapter 6: Mission Specific for Operations Level Personnel**

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NATIONAL FIRE PROTECTION ASSOCIATION 472 (cont'd)

Chapter 6:

- **6.1: Introduction**
- **6.2: Personal protective equipment**
- **6.3: Technical and mass decontamination**
- **6.4: Evidence preservation and sampling**
- **6.5: Product control**
- **6.6: Air monitoring and sampling**

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NATIONAL FIRE PROTECTION ASSOCIATION 472 (cont'd)

- **Chapter 7: Competencies for Hazardous Materials Technician**
- **Chapter 8: Competencies for Incident Commanders**

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NATIONAL FIRE PROTECTION ASSOCIATION 472 (cont'd)

Chapter 8:

- **8.1: General**
- **8.2: Analyzing the incident**
- **8.3: Planning the response**
- **8.4: Implementing the response**
- **8.5: Evaluating progress**
- **8.6: Terminating the response**

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NATIONAL FIRE PROTECTION ASSOCIATION 472 (cont'd)

- **Chapter 9: Competencies for Specialist Employee**
- **Chapter 10: Competencies for Hazardous Materials Officer (geared to WMD-related incidents)**
- **Chapter 11: Competencies for Hazardous Materials Safety Officer**

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NATIONAL FIRE PROTECTION ASSOCIATION 472 (cont'd)

- **Chapter 12: Competencies for a Hazardous Materials Technician With a Tank Car Specialty**
- **Chapter 13: Competencies for a Hazardous Materials Technician With a Cargo Tank Specialty**
- **Chapter 14: Competencies for a Hazardous Materials Technician With an Intermodal Tank Specialty**
- **Chapter 15: Competencies for a Hazardous Materials Technician With a Marine Tank/Vessel Specialty**

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NATIONAL FIRE PROTECTION ASSOCIATION 472 ANNEX MATERIAL

- **Explanatory material (A)**
- **Competencies for a technician with a flammable liquid bulk storage specialty (B)**
- **Competencies for a technician with a flammable gas bulk storage specialty (C)**
- **Competencies for a technician with a radioactive material specialty (D)**

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NATIONAL FIRE PROTECTION ASSOCIATION 472 ANNEX MATERIAL (cont'd)

- **Overview of responder levels and tasks at hazmat/WMD incidents (E)**
- **Definitions of hazardous materials (F)**
- **United Nations (U.N.)/DOT hazard classes and divisions (G)**
- **Informational resources (H)**

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NATIONAL FIRE PROTECTION ASSOCIATION 473

Two levels of response activities:
- **Basic life support (BLS)**
- **Advanced life support (ALS)**

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NATIONAL RESPONSE FRAMEWORK

- **Required as a result of Homeland Security Presidential Directive 5 (HSPD 5)**
- **Guide to how the nation conducts all-hazards response**
- **Built upon NIMS**
- **Fifteen national planning scenarios**
- **Annexes**
- **Refer to the National Response Framework (NRF) overview in the Student Manual (SM), Appendix D**

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Activity 1.4
Training Assessment

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SUMMARY

- **First responders should conduct their activities within a standard of care.**
- **EPA 311 and OSHA 1910.120 provide a mandatory standard of care that must be followed.**
- **Consensus standards, such as NFPA, while not mandatory unless adopted, should be followed whenever possible.**

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APPENDIX A

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LIABILITY ISSUES IN HAZARDOUS MATERIALS RESPONSE

Dr. John C. Pine, the author of this material, was a member of the development team that wrote this course. He is an associate professor at the Public Administration Institute, Louisiana State University. This monograph provides a deeper analysis of the topics discussed in the section on liability.

The monograph is not intended to supersede the efforts of state attorneys general or local governmental legal departments in examining the specific aspects of tort liability of a particular state. Rather, it serves as a general guideline for public administrators and officials who are involved in emergency management programs and activities, and who are concerned with matters of tort liability.

Public, private, and nonprofit organizations have all experienced an increasing number of liability suits resulting from hazardous materials emergencies. There is a widespread perception today that there is a greater risk of being subjected to a liability suit than ever before. Major changes have occurred during the past twenty years in the liability of governmental jurisdictions, private companies, and nonprofit organizations involved in hazardous materials emergency incidents. Many managers are concerned that their decisions associated with hazardous material emergency incidents will result in costly liability suits and judgments.

Liability resulting from the acts of public employees or organizations is governed by both State and Federal law. This text defines the general elements of liability in hazardous materials emergency activities.

Emergency responders should understand how the principles of the law apply to emergency response activities, even if specific immunity provisions exist. The law is a complex arena, and whether liability exists depends on the circumstances in each situation, such as who is involved and when actions were taken. Responders should also understand the law of torts in a State, and finally, the specific provisions of State and Federal law. The law of torts is constantly changing and the risk of liability is always present.

The goal of any emergency response official is to understand the danger areas in the law and take proactive steps to manage emergency activities, thus reducing the risk of accidental harm. The strategy is to plan, organize, implement, and control public programs and activities to avoid losses.

LIABILITY UNDER STATE LAW

A tort is an act that harms another. It is committed when a person commits an act or fails to act, without right, and as a result another is harmed, directly or indirectly. Tort liability involves a civil action for personal injuries or property damage.

Torts encompass a very broad area of the law including intentional acts, negligence, and strict or absolute liability (1). Tort law involves civil, rather than criminal, liability (2).

The law in each State recognizes individual or business interests. The law of torts is intended to protect these interests against harm (3). It provides a means for a person harmed by another to be compensated for his or her loss, and can be viewed as a means of restoring that which the

government has harmed. The basic philosophy of tort law suggests that under basic principles of fairness, individuals harmed by a public unit should to some degree be compensated.

Tort liability suits also provide a basis for distributing losses to those who are responsible for the harm (4). Tort law provides a systematic means for analyzing and resolving liability claims, while protecting both the interests of the person injured and the governmental jurisdiction.

Tort liability includes three distinct areas: intentional torts, negligence, and strict liability (5).

- **Intentional** tort liability includes liability for trespass (6), assault (7), battery (8), false arrest or imprisonment (9), intentional infliction of emotional distress (10), defamation, invasion of privacy, and invasion of civil rights.

- **Negligence** is the unintentional invasion of a person's interest protected by law, where the actor is at fault, and where the actor's conduct is the legal cause of the injury suffered. The fact that one causes injury to another does not establish liability per se. Rather, it must be established that a person should have recognized a risk of harm to another (or a class of which he is a member), and that the conduct that led to harm to others was below a standard established by the law (11).

- **Strict liability** is known as liability without fault. It suggests that in certain circumstances one should be responsible for the consequences of his or her actions or omissions, regardless of fault, and regardless of his or her exercise of due care. Strict liability was first applied in cases involving abnormally dangerous activities, such as blasting (12), but has achieved significantly broader application in the law of product liability and in cases involving the violation of statutes creating mandatory standards of care.

The Reduction of Governmental Immunity

For many years the States and their political subdivisions enjoyed immunity from suits that sought relief for the wrongful conduct of governmental officials or employees. This immunity, based on the English common law principal of **sovereign immunity,** was adopted in early American law (13). Under sovereign immunity, individuals harmed by the action of a governmental unit are prohibited from recovering damages from the State or its political subdivisions unless the governmental unit agrees to pay the claim. In effect, the public jurisdiction is immune from suit. Although the English rule of sovereign immunity was personally identified with the King (as sovereign), the American doctrine extended immunity to the Federal government, the States, and their political subdivisions (14). Until 1960 only five States allowed suits against the State or its political subdivisions. Beginning in the 1960s a series of court decisions and legislative actions at the State level eroded the principle of sovereign immunity. The law involving sovereign immunity was changed in 15 States during the 1960s; 28 other States changed the law of tort suits against public agencies in the 1970s; and 3 more States addressed the issue of immunity in the 1980s (15).

By 1992 State legislatures or the courts in every State had addressed sovereign immunity of governmental jurisdictions. In 20 States the State legislatures made changes in the State constitution or statutes to alter the immunity of governmental jurisdictions. In 31 States the courts judicially abrogated sovereign immunity for either political subdivisions or the State (16). These changes in the law resulted from a determination by the courts or the legislature that sovereign immunity was outdated.

GOVERNMENTAL LIABILITY AND IMMUNITY

Negligence

Where tort immunity has been waived, response units and employees are most often sued for damages for alleged negligence in the performance of their duties. Negligence indicates an unintentional action by an individual that causes harm to another (tort), where the person owes a duty to another to exercise a degree of care. The legal standard in negligence cases has often been stated as simply, the duty to exercise that degree of care, skill, and diligence that a reasonable, prudent person would exercise under like or similar circumstances. However, this rule must be understood in terms of its essential elements, which include:

1. The existence of a duty, recognized by law, for a person (here the governmental employee) to conform to a defined standard of care. The standard may be defined by common law (based upon judicial decisions), or by statute;

2. A failure to conform to that standard of care, or a failure to carry out the duty;

3. Actual loss or damage to the interests of the injured party(ies) (17); and

4. A causal connection between the act of the wrongdoer (his or her negligence) and a resulting injury to a third party(ies), which the law recognizes as the legal cause of the injury.

All negligence cases have these elements in common, and absence of proof of any one element will defeat a finding of liability.

Duty

A duty of care may be imposed by common law, by statute, or may be created by the voluntary assumption of a responsibility. The common law generally imposes a duty of care where a person must recognize that his or her conduct involves a risk of harm to another. The common law duty requires a person to use a high degree of attention, perception, memory, knowledge, intelligence, and judgment in his or her actions.

Public entities have a common law duty to repair or place off limits premises and equipment that is in a dangerous condition. Public servants have a duty to protect persons in their care and

custody, including protective custody (18). Similarly, a public works department, when informed of a road hazard, has a duty to repair defects (19).

This duty or standard of conduct may also be imposed and defined by statute such as traffic acts, motor vehicle maintenance codes, work place safety statutes, medical malpractice, environmental protection, or hazardous materials statutes (20). These statutes may or may not specifically mention civil tort liability; they may simply establish a duty of care. Where a penalty is not specified, a court is generally free to adopt or reject the statutory standard in civil tort cases. Where the statute specifically provides for civil actions or suits, the court will adopt the statute's specification of duty and standard of care (21). In such cases, liability may be determined simply upon proof that the statute has been violated (22).

In some emergency response situations, individuals suffering injury or property damage as a result of a response unit's negligence may file suit against the parties causing the harm. Though the response unit may have immunity during the response phase, the unit may be liable for its actions before the incident. The unit may have made the injury more severe. For example, a State statutory duty to have a current emergency plan imposes an obligation on the governmental jurisdiction to prepare a plan. Failure to carry out a statutory duty could lead to liability even though the emergency management statute includes an immunity provision.

Breach of Duty

Liability based on negligence means there has been a breach of duty. It is defined as the failure to conform to prevailing professional practice, as illustrated by an employee who may have failed to act as a reasonable person under the same circumstances (23). The standard of care is critical to the determination of a finding of negligence. While a standard may be established by the profession, the courts have held that the injured party must be given an opportunity to show that the prevailing practice is inadequate. Thus the courts, rather than the profession, may ultimately determine the standard of care (24).

Decisions

The decisions in negligence cases are almost always dependent upon findings of fact in the case, the particular conduct of the alleged wrongdoer, and whether the acts of the wrongdoer are the cause in fact of the injury(ies) suffered by the complaining party. Factual disparities among cases, no matter how slight, may lead to different conclusions about liability.

The failure to drive a vehicle safely may be actionable where the driver fails to exercise the degree of care which a reasonable person with his training or skill would exercise (25). A city may be liable for injuries resulting from accidents that are the result of malfunctioning traffic lights or signs where the city fails to correct the malfunction within a reasonable time after receiving notice (26). Property defects that cause dangerous conditions may be the basis of liability where the city has notice, or should have known of the presence of the defect and the danger it created. Where the city has notice of dangerous conditions, there may be liability if the

city fails to act to remedy the defect (27). While a natural condition is not dangerous per se, there may be liability where the city has actual or constructive knowledge of a buildup of ice or other condition creating a danger to motorists (28).

The Supreme Court of Washington in Brown v. MacPherson's, Inc., held that property owners stated a cause of action against the State for a failure to warn of a danger. The court found that an expert had told a State employee that specific property was in danger. The State employee led the expert to believe that the State would warn the property owners in the area; the expert thus refrained from warning residents of the danger. Since the State employee did not warn the owners of the danger, the court allowed the plaintiff to bring the liability action (29).

Statutory Mandates

The violation of a standard of care established by statute is negligence as a matter of law. Under this concept the injured party bringing suit (plaintiff) need only prove the applicability of the statute and that its violation by the defendant (party being sued) caused the injuries. The statute establishes duty and standard of care. Thus, for example, the failure to conduct an inspection, as required by statute, may be negligence **per se** (as a matter of law). The critical question in such cases is whether the legislative intent of the statute in question is to establish strict or absolute liability, or whether violation of the statute is on its face (**prima facie**) evidence of negligence.

Governmental Liability and Immunity

The liability of governmental units may be shaped by: (1) Governmental/Proprietary Immunity for specific functions of a jurisdiction; (2) the Discretionary Function Test for decisions of government officials; (3) Immunity provisions in State statutes.

Governmental/Proprietary Immunity

Fifteen jurisdictions currently retain a distinction in their tort law between governmental functions that have been performed by the government, and those functions that are proprietary in nature or performed traditionally by the private sector. They include those activities perceived as essential and traditionally performed only by governmental units. Because they are governmental in nature, public officials, employees, and jurisdictions are immune from suit in these areas. Under the governmental function theory, public safety, fire fighting, or police activities, and similar mandated responsibilities of government are immune from liability (30).

Proprietary functions involve activities that are similar to business activities. These operations may involve transit systems, parking garages, city hospitals, recreation services, and sewer and garbage collection.

Emergency response operations, law enforcement, or firefighting activities are usually recognized as a governmental function. These units therefore operate with immunity in certain jurisdictions.

Immunity For Discretionary Actions

The governmental/proprietary function distinction, as a basis for tort liability of governmental units, is based on the overall nature of the activity or program. A second form of immunity, discretionary, conditions immunity on the nature of the act itself, rather than the program or type of operational activity. This form of immunity grants protection for discretionary acts as opposed to ministerial or operational ones.

Discretionary immunity evolves from the judgmental decision-making process of public officials and employees. The intent of discretionary immunity is to free officials from fear of tort liability if that judgment results in harm to another. The discretionary/ministerial distinction also shows a concern of courts and legislatures that they not interfere with the executive decision-making process and violate the principle of separation of governmental powers. The law of tort liability seeks to provide a means for those injured by the torts of public officials and employees, but not to a degree that would discourage well qualified persons from serving in high public positions (31).

A police officer's use of excessive force in making an arrest was considered by a Michigan court a ministerial operation activity rather than discretionary. The court determined that the limits of discretion had been stressed in training sessions for new officers and for seasoned officers (32). In Missouri the court defined a discretionary act as one that requires the exercise of reason in determining how or whether the act should be done while a ministerial function is one that is required to be performed without regard to a person's judgment (33).

The decision whether to deploy response units in a particular fashion is discretionary, while the careless discharge of duties, or negligent operation of a vehicle is ministerial, and thus subject to legal action if injury proximately results (34).

The decision to declare an emergency, to order an evacuation, or adopt a specific program would be a high level policy decision and likely viewed by the courts as a discretionary action. Judgments in selecting basic evacuation routes when priorities and basic policies are being formed by the jurisdiction's chief policy makers are likely to qualify as discretionary acts. Where officers exercise their judgment when given broad responsibilities with the necessary authority, they may be exercising a discretionary function and thus immune.

Statutory Immunity

Many States have included specific provisions in their statutes recognizing immunity in tort claims against government units, employees, and volunteers involved in emergency response activities. Alaska, Kansas, South Carolina, South Dakota, and Utah recognize immunity for emergency activities in their comprehensive tort liability statutes (35).

In addition to provisions in the State comprehensive tort liability statute, specific immunity provisions may be included in the State emergency management act. The critical element of these provisions involves the definition of an "emergency." If the emergency activity is not included in the definition of "emergency," then the immunity provision does not apply. The State immunity provisions in State emergency management acts may be broad so as to include **any emergency management activity** or restricted to actions only **during designated emergencies**. A broad provision could include a statement similar to the following:

> Neither the State nor any political subdivision thereof, nor other agencies nor, except in case of willful misconduct, the agents, employees, or representatives of them, engaged **in any emergency management activity**, while **complying with or attempting to comply with this chapter or rule** shall be liable for the death of or any injury to persons, or damage to property, as a result of such activity (36).

This type of immunity provision could be used as a defense to a claim of negligence under State law. The scope of the immunity provision would protect emergency responders in both formally declared and undeclared State or local emergencies.

Immunity may be more restricted in other States that have immunity provisions applicable only in **declared emergencies by the proper authority**. Hawaii, Idaho, Kansas, Massachusetts, Montana, Oregon, Pennsylvania, and Tennessee have this form of restricted immunity.

Some States provide immunity in training exercises, false alerts, or any other precautionary measure taken by the governmental unit (37). There is little question in these States of the intent of the legislature to protect public employees, their representatives, and organizations during emergency management activities. Public jurisdictions can participate in emergency activities without fear that their reasonable actions will be protected from civil suit (38).

In addition to general provisions in State tort claims acts and emergency management statutes, many States provide immunity provisions relating to firefighting and emergency response activities such as hazardous materials incidents. The following are examples of specific statutory immunity for first responders:

> **Ark. Stat. Ann. Section 16-5-101 (1987)**. Exempts volunteer firefighters, board members of volunteer fire departments, and administrative personnel from civil liability for personal or property damages.

Ga. Code Section 36-33-3. Not liable for the torts of policemen or other officers engaged in the discharge of the duties imposed on them by law.

Iowa Code Ann. Section 613A.1(1). Grants immunity from civil liability to volunteers who perform services for the State government or any agency or subdivision of the State government (11) (1988). A claim based upon or arising out of an act or omission in connection with an emergency response including but not limited to acts or omissions in connection with emergency response communications services. The remedy against the municipality provided by Section 613A.2 shall hereafter be exclusive of any other civil action or proceeding by reason of the same subject matter against the officer, employee or agent whose act or omission gave rise to the claim, or the officer's, employee's, or agent's estate. This section does not expand any existing cause of action or create any new cause of action against a municipality. (The 1988 amendment added subsection 11 relating to claims in connection with emergency response and added unnumbered paragraphs that provide that this section does not expand any existing cause of action or create any new cause of action against a municipality.)

La. Revs. Stat. Ann. 9:2793. A person who in good faith gratuitously renders emergency care, at the scene of an emergency, shall not be liable.

La. Revs. Stat. Ann. Section 37:1735. Grants immunity from civil liability to volunteer firefighters rendering emergency or rescue services in the course of performing their duties. First aid care given to persons is excluded from immunity as is grossly negligent or intentional conduct.

La. Revs. Stat. Ann. Section 40:1235(A)(3). Grants immunity from civil liability to parish, specialty unit, component or State medical or social services organization or its designee, which is statutory mandated to participate without compensation in an emergency services system, nor any committee shall be liable for any civil damages as a result of an act or omission in the performance of its administrative duties or donated services.

Md. Cts. & Jud. Proc. Code Ann. Section 5-309.1. A fire company or rescue company and its personnel are immune from civil liability for any act or omission in the course of performing duties unless waived by insurance.

N.J. Stat. Ann. Section 55:13A-6. Provides immunity to persons, partnerships, corporations, and associations from civil liability incurred in the course of preparing for or responding to a discharge of hazardous materials. The immunity does not extend to persons responsible for the discharge or those who are reimbursed for their services.

N.Y. Municipal Law Section 50-c. Liability for negligence of firefighters/police officers in operation of vehicles. Provision is not applicable to New York City. N. Y. Gen. Mun. Law 50 (c) now in Govs. Tort Liability Section 161, 184, & 186.

Ohio Revs. Code Ann. Section 2744.02 (1989).

(1) Classification of functions of political subdivisions as governmental and proprietary. A political subdivision is not liable in damages in a civil action for injury, death, or loss to persons or property caused by an act or omission of the political subdivision or an employee of the political subdivision in connection with a governmental function. Municipalities will be liable for the operation of motor vehicles by employees.

a. Immunity for municipal police in the operation of a motor vehicle while responding to an emergency call.

b. Immunity for municipal firefighters in responding to an emergency call.

c. Immunity for emergency medical service personnel in responding to emergency calls.

S.D. Codified Laws Ann. Section 20-9-4.1 (1986). Immunity granted for emergency care of peace officer, conservation officer, member of any fire department, police department and their first aid, volunteer rescue or emergency squad. Immunity extends to operation of any motor vehicle in connection with care.

Vt. Stat. Ann. Title 19 Section 2922 (1984). Immunity granted to volunteer fire department in extinguishing a fire.

Va. Code Section 44-146.36 (1989). Grants immunity from civil damages to a person who, upon request of the appropriate public service personnel, assists in any way at an emergency or accident involving hazardous wastes and materials.

Wis. Stat. Ann. Section 895.48(2). Creates a "good Samaritan" rule granting immunity from civil liability to persons who provide assistance or advice in handling problems in emergency or potential emergency situations relating to the threatened or actual discharge of hazardous substances. The immunity extends to mitigation of effects, prevention, cleanup, and disposition. The act excludes persons who cause and are liable for the discharge or whose actions are grossly negligent, reckless, or intentional as well as those who are compensated for their efforts from the grants of immunity.

Defenses in State Liability Suits

Response units may avoid liability by using two major types of defenses: denial defenses and affirmative defenses.

A denial directly disputes the allegation by the plaintiff that the defendant has acted negligently. In effect, the defendant is implying that the response unit has acted with reasonable care. When the defendant denies plaintiff's allegation of negligence, the burden of proof remains on plaintiff to prove the four elements of negligence: duty, breach of duty, legal causation, and injury. Although not obligated to do so, the defendant usually offers proof of his or her actual conduct, to show that it conformed to the required standard of care. Unless plaintiff's proof outweighs defendant's on this issue, there is no finding of liability.

Affirmative defenses may allow the defendant to avoid liability, even where his or her conduct is negligent. These defenses include, but are not limited to:

1. The filing of or bringing suit after the statute of limitations (which bars the action);

2. The settlement of the claim;

3. The person bringing suit contributed to the injury (contributory, comparative negligence); or

4. Assumption of the risk causing the injury.

Statutes of Limitations

Statutes of limitations are legislative enactments that impose time restrictions on filing a notice of a claim or the liability suit. Statutory periods of limitations on the bringing of actions do not ordinarily begin to run until the injured party has been harmed and has a basis for the claim. Once the time restriction concludes, the suit is barred.

Since the running of the statutory period could bar plaintiff's claim, even though he or she was unaware of his or her injury, some States have held the running of the time requirement does not begin until plaintiff discovers, or with reasonable diligence, should have discovered, the injury (39).

Contributory Negligence

A plaintiff may not recover damages for injuries suffered as a result of the defendant's negligence, if the plaintiff's conduct was also negligent and contributed to his or her injuries (contributory negligence). Under these circumstances the plaintiff's own negligent conduct may bar recovery entirely, though the defendant was negligent and that negligence contributed to plaintiff's injury.

The doctrine of contributory negligence has been abolished in some States, and in its place, is the apportioning of damages in negligence cases in direct proportion to the relative fault of the parties. This doctrine of "comparative" negligence does not bar plaintiff from recovering damages for his or her injuries, if those injuries were caused, in part, by defendant's conduct. Rather, plaintiff's recovery is reduced in some proportion, based upon his or her fault, if that fault contributed to his or her injuries. A "pure" form of comparative negligence also may apply, apportioning recovery in direct proportion to the relative fault of the parties.

However, a modified doctrine may be used which applies a "50%" system, or an "equal to or greater than" system. Under this modified system, a plaintiff may recover damages, unless his or her negligent conduct is equal to or greater than that of defendant, in which case plaintiff recovers nothing. The assertion of contributory or comparative negligence simply puts into issue plaintiff's own conduct as a cause of injury.

Assumption of Risk

Assumption of risk means that the injured party (plaintiff), has voluntarily expressed in advance or implied that he or she is aware of the risks involved, and has agreed to take his or her chances of injury. The assumption of risk may be by express agreement, implied agreement, or by simple awareness (knowledge) of an obvious risk.

SPECIAL CONSIDERATIONS IN CLAIMS UNDER STATE LAW

Vicarious Liability

Most States recognize that the governmental unit is liable for the negligent acts or omissions of its agents or employees, acting within the scope of their duties as public employees. The liability for the employee's actions is passed on to the governmental unit as employer, under a theory normally known as **vicarious liability**. The concept also exists for private persons who control, or have the ability to control, the actions of subordinates. In many instances, the vicarious liability of the governmental employer is specified in the tort liability statute, which may limit liability to negligent acts or omissions or for employees acting within the scope of their employment or duties.

Individual Liability

The governmental unit may avoid liability for an employee's actions by contending that the employee acted outside the scope of his or her duties, acted with malice, or with the reckless disregard for the rights of others. When the employee acted with malice or the employee's actions were outside the scope of the job, the employee may be individually liable, and the governmental unit not liable.

Willful Misconduct (Malfeasance)

Immunity provisions in most State statutes include a provision that protects the acts of employees or representatives of the employer from civil claims except for willful misconduct, gross negligence, or intentional harm to others. Willful or wanton misconduct is that which takes on the aspect of highly unreasonable actions. It is an extreme departure from ordinary care and where harm or injury is apparent. It involves conduct intended to cause injury to another, but must be conduct that is more than a mere mistake resulting from inexperience or confusion. It must be more than thoughtlessness or inattention (40).

LIABILITY UNDER FEDERAL LAW

During the late 1970s and the 1980s the threat of hazardous materials accidents with harm to health and chemical contamination to the environment became real to people around the world. Hazardous materials incidents demonstrated that a disaster could be deadly, cause extensive personal injury and property damage, and occur in one's backyard. Emergency planning requirements and community right-to-know provisions in the Superfund Amendments and Reauthorization Act of 1986 (SARA) encourage and support emergency planning efforts at the State and local level and provide local governments and residents with information concerning potential chemical hazards present in their communities.

The Emergency Planning and Community Right-to-Know Act (EPCRA) addresses the need for establishing and maintaining plans for responding to chemical accidents. Hazardous materials spills or releases have the potential to inflict health and environmental damage, and cause significant disruption in both large and small communities. The Act acknowledges that, through better planning and coordination, the potential loss from disasters can be minimized (41).

Initial Superfund legislation, adopted in 1976, provided for the cleanup of toxic waste sites and spills; however, it became apparent that an additional problem existed which was not addressed by Superfund. Accidental releases of extremely hazardous materials posed a threat to public health and the environment. EPCRA became the primary means of facilitating emergency planning that could help prevent accidents and prepare facilities and the surrounding community to respond to a release or spill of hazardous materials.

Liability Under Emergency Planning & Community Right-to-Know (EPCRA)

Provisions of this act establish requirements for local emergency planning committees to prepare an emergency plan for possible release of hazardous substances, and make available information to the public on toxic chemicals in the community. Fixed facilities that store, produce or transport hazardous materials must cooperate in the planning and information gathering process (42). Local planning committees must review the plan annually (or more frequently as circumstances merit), conduct exercises to implement the plan, and make recommendations to the State commission, local governmental units, and facilities about resources required to make the plan effective.

The community right-to-know provisions require that the local committee make specific information available to the public during normal working hours. Information made available to the public would include the local emergency response plan, forms reflecting what hazardous materials exist in the community, and toxic chemical release records.

Civil penalties exist for any person other than a governmental entity who violates the reporting requirements (43). A fine up to $25,000 may be assessed by a Federal District Court for a failure to report toxic and hazardous chemicals. An additional fine of up to $10,000 may be assessed against any person other than a governmental entity who fails to submit material safety data sheets or provide information to health professionals (44). These penalties may be assessed against persons including businesses (not to include governmental jurisdictions) that fail to comply with requirements of the act.

A citizen may file a civil action in a Federal District Court under EPCRA against the administrator of the United States Environmental Protection Agency (EPA), the governor, or the State emergency response commission for failure to respond to a request for Tier II information within 45 days after the date of receipt of the request (45). The citizen may also file a claim in Federal District Court against a State emergency response commission for its failure to fulfill the obligations of the commission. EPCRA, however, only authorizes injunctive relief against a State commission; it does not authorize money damages or penalties for the State commission's failure to comply with the act. The court may thus issue an injunction or court order requiring the commission to comply with Title III. (46).

EPCRA does not create a Federal cause of action for citizens who wish money damages from the commission, individual members of commissions or committees, or the governor (47). Money damages may be assessed by the court for reasonable attorney fees and expert witness fees to the prevailing or substantially prevailing party when the court determines that such an award is appropriate (48).

Hazardous Waste Operations and Emergency Response (49)

OSHA 29 CFR 1910.120 and EPA 40 CFR 311 are identical regulations mandated by SARA. Both OSHA and EPA promulgated these regulations because OSHA regulations only apply in States with their own OSHA agencies, while the EPA regulations apply to all other States. These regulations apply to everyone, whether in an OSHA State or not.

The regulations address emergency response and include definitions of an emergency response, the organization of work groups using the "buddy system," what constitutes a hazardous material response team, what is included in the term hazardous substance, health hazard considerations, and so on. The regulations mandate medical monitoring and annual physicals for specific response personnel. They also require the development of specific emergency response plans for response agencies. A type of response management system, known as the Incident Command System (ICS), is also mandated.

At the core of ICS is the overall commander known as the Incident Commander (IC). The IC is responsible for the coordination and control of all on-scene response activities and operations. The regulations require the presence of a knowledgeable safety officer, who must be assigned to identify and evaluate hazards and assure the safe conduct of the operations. There are protective clothing and operational procedure requirements, as well as emergency medical requirements. Finally, the regulations address the need for competency-based training for personnel.

Training

According to the training requirements, all responders must receive minimum levels of training, depending upon the roles and functions they will fill and perform. There are five basic levels of training:

1. First responder at the awareness level;
2. First responder at the operational level;
3. Hazardous materials technician;
4. Hazardous materials specialist; and
5. On-scene IC.

It is important to note that the timeframes mentioned in the regulations and standards for each level are the minimum hours of training. The competencies and proficiencies that are needed for each level are more important.

Emergency Response Plans & Standard Operating Procedures

OSHA 1910.120 and EPA 311 require each employer, whether governmental or private, to develop specific response plans and/or use the plans required by Title III. The regulations (Hazardous Materials Emergency Response Plan (OSHA 29 CFR Part 1910.120, paragraph q(1)), require emergency response agencies to develop emergency response plans (ERP). The ERP may include a hazardous materials response standard operating procedure (SOP).

Paragraphs q(1) and (2) of 1910.120 offer recommendations and guidance on the development of the hazardous materials ERP. Specific information regarding local approaches and procedures should be available through the emergency response and operations plans developed by the Local Emergency Planning Committee (LEPC).

To be effective, the hazardous materials ERP must be integrated into the operational system of the LEPC plan as the ERP is developed. The LEPC plan is available to everyone, including the public, emergency response agencies, the medical community, and the press. The availability is provided in SARA Title III as part of the community planning and right-to-know requirements.

OSHA 1910.120 recommends the development of a standard operating procedure/standard operating guides (SOP/SOG) for hazardous materials incidents. It recommends that all potentially affected employees be sufficiently trained to follow the SOP/SOG as it is written.

Incident Command

The regulations further mandate that an Incident Command System (ICS) be the operating management system for all response personnel. That includes police, emergency medical, fire, and public works personnel--in short, anyone that might be expected to respond. As the person in charge, the IC is responsible for the success of the **entire** operation and the safety of **all** personnel involved.

Safety Officer

OSHA 1910.120 requires the designation of a **safety official** who is responsible for **all safety** at the scene. The safety official has the authority to **alter, suspend, or terminate** any operation in an IDLH atmosphere when he or she deems it necessary to protect the safety of any responder. Clearly, such a person needs to be one of the most knowledgeable and competent individuals at the operation.

LIABILITY UNDER THE OSHA AND EPA REGULATIONS

OSHA 29 CFR 1910.120 and EPA 40 CFR 311 require each employer, whether governmental or private, to develop specific hazardous materials response plans or use the plans required by the Emergency Planning and Community Right-to-Know Act (EPCRA). Emergency response plans must include a hazardous materials response standard operation procedure (SOP). The LEPC plan must be available to the public, emergency response agencies, the medical community, and the press.

If an employer or emergency responses organization fails to comply with the administrative requirements of those Federal laws and regulations, the OSHA and EPA may levy fines or penalties against the governmental unit. These Federal requirements impose obligations on the employer and do not provide for civil remedies against first responders or public officials.

Statutes granting immunity from personal liability for acts performed under State law are intended to create qualified immunity for those it protects. These statutes extend protection onto their ordinary negligent acts and not from personal liability for gross negligence or intentional torts. Emergency responders should understand there are limits to the immunity provided for emergency management activities. Employees of official representatives of public jurisdictions may be held liable for their conduct that is reckless, unjustifiable, intentional, and that goes well beyond what the reasonable and prudent person would have done under these circumstances.

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APPENDIX B

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11. "Loss Prevention in the Process Industries," Volumes I and II; Frank P. Lees, Butterworth; London 1983.
12. "Safety and Health Program Management Guidelines," 1989; U.S. Department of Labor, Occupational Safety and Health Administration.
13. "Safety and Health Guide for the Chemical Industry," 1986, (OSHA 3091); U.S. Department of Labor, Occupational Safety and Health Administration; 200 Constitution Avenue, N.W., Washington, D.C. 20210.
14. "Review of Emergency Systems," June 1988; U.S. Environmental Protection Agency (EPA), Office of Solid Waste and Emergency Response, Washington, DC 20460.
15. "Technical Guidance for Hazards Analysis, Emergency Planning for Extremely Hazardous Substances," December 1987; U.S. Environmental Protection Agency (EPA), Federal Emergency Management Administration (FEMA) and U.S. Department of Transportation (DOT), Washington, DC 20460.
16. "Accident Investigation * * * A New Approach," 1983, National Safety Council; 444 North Michigan Avenue, Chicago, IL 60611–3991.
17. "Fire & Explosion Index Hazard Classification Guide," 6th Edition, May 1987, Dow Chemical Company; Midland, Michigan 48674.
18. "Chemical Exposure Index," May 1988, Dow Chemical Company; Midland, Michigan 48674.

[57 FR 6403, Feb. 24, 1992; 57 FR 7847, Mar. 4, 1992, as amended at 61 FR 9238, Mar. 7, 1996; 67 FR 67964, Nov. 7, 2002]

§ 1910.120 Hazardous waste operations and emergency response.

(a) *Scope, application, and definitions*—(1) *Scope.* This section covers the following operations, unless the employer can demonstrate that the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards:

(i) Clean-up operations required by a governmental body, whether Federal, state, local or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the EPA's National Priority Site List (NPL), state priority site lists, sites recommended for the EPA NPL, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained);

(ii) Corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901 *et seq.*);

(iii) Voluntary clean-up operations at sites recognized by Federal, state, local or other governmental bodies as uncontrolled hazardous waste sites;

(iv) Operations involving hazardous wastes that are conducted at treatment, storage, and disposal (TSD) facilities regulated by 40 CFR parts 264 and 265 pursuant to RCRA; or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and

(v) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.

(2) *Application.* (i) All requirements of part 1910 and part 1926 of title 29 of the Code of Federal Regulations apply pursuant to their terms to hazardous waste and emergency response operations whether covered by this section or not. If there is a conflict or overlap, the provision more protective of employee safety and health shall apply without regard to 29 CFR 1910.5(c)(1).

(ii) Hazardous substance clean-up operations within the scope of paragraphs (a)(1)(i) through (a)(1)(iii) of this section must comply with all paragraphs of this section except paragraphs (p) and (q).

(iii) Operations within the scope of paragraph (a)(1)(iv) of this section must comply only with the requirements of paragraph (p) of this section.

Notes and Exceptions: (A) All provisions of paragraph (p) of this section cover any treatment, storage or disposal (TSD) operation regulated by 40 CFR parts 264 and 265 or by state law authorized under RCRA, and required to have a permit or interim status from EPA pursuant to 40 CFR 270.1 or from a state agency pursuant to RCRA.

(B) Employers who are not required to have a permit or interim status because they are conditionally exempt small quantity generators under 40 CFR 261.5 or are generators who qualify under 40 CFR 262.34 for exemptions from regulation under 40 CFR parts 264, 265 and 270 ("excepted employers") are not covered by paragraphs (p)(1) through (p)(7) of this section. Excepted employers who are required by the EPA or state agency to have their employees engage in emergency response or who direct their employees to engage in emergency response are covered by paragraph (p)(8) of this section, and

cannot be exempted by (p)(8)(i) of this section. Excepted employers who are not required to have employees engage in emergency response, who direct their employees to evacuate in the case of such emergencies and who meet the requirements of paragraph (p)(8)(i) of this section are exempt from the balance of paragraph (p)(8) of this section.

(C) If an area is used primarily for treatment, storage or disposal, any emergency response operations in that area shall comply with paragraph (p)(8) of this section. In other areas not used primarily for treatment, storage, or disposal, any emergency response operations shall comply with paragraph (q) of this section. Compliance with the requirements of paragraph (q) of this section shall be deemed to be in compliance with the requirements of paragraph (p)(8) of this section.

(iv) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances which are not covered by paragraphs (a)(1)(i) through (a)(1)(iv) of this section must only comply with the requirements of paragraph (q) of this section.

(3) *Definitions—Buddy system* means a system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

Clean-up operation means an operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment.

Decontamination means the removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health affects.

Emergency response or *responding to emergencies* means a response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses within the scope of this standard. Responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.

Facility means (A) any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, storage container, motor vehicle, rolling stock, or aircraft, or (B) any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any water-borne vessel.

Hazardous materials response (HAZMAT) team means an organized group of employees, designated by the employer, who are expected to perform work to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The team members perform responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of the incident. A HAZMAT team is not a fire brigade nor is a typical fire brigade a HAZMAT team. A HAZMAT team, however, may be a separate component of a fire brigade or fire department.

Hazardous substance means any substance designated or listed under paragraphs (A) through (D) of this definition, exposure to which results or may result in adverse affects on the health or safety of employees:

(A) Any substance defined under section 101(14) of CERCLA;

(B) Any biological agent and other disease-causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic

mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring;

(C) Any substance listed by the U.S. Department of Transportation as hazardous materials under 49 CFR 172.101 and appendices; and

(D) Hazardous waste as herein defined.

Hazardous waste means—

(A) A waste or combination of wastes as defined in 40 CFR 261.3, or

(B) Those substances defined as hazardous wastes in 49 CFR 171.8.

Hazardous waste operation means any operation conducted within the scope of this standard.

Hazardous waste site or *Site* means any facility or location within the scope of this standard at which hazardous waste operations take place.

Health hazard means a chemical, mixture of chemicals or a pathogen for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, heptaotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. It also includes stress due to temperature extremes. Further definition of the terms used above can be found in appendix A to 29 CFR 1910.1200.

IDLH or *Immediately dangerous to life or health* means an atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

Oxygen deficiency means that concentration of oxygen by volume below which atmosphere supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen by volume is less than 19.5 percent oxygen.

Permissible exposure limit means the exposure, inhalation or dermal permissible exposure limit specified in 29 CFR part 1910, subparts G and Z.

Published exposure level means the exposure limits published in "NIOSH Recommendations for Occupational Health Standards" dated 1986, which is incorporated by reference as specified in § 1910.6 or if none is specified, the exposure limits published in the standards specified by the American Conference of Governmental Industrial Hygienists in their publication "Threshold Limit Values and Biological Exposure Indices for 1987–88" dated 1987, which is incorporated by reference as specified in § 1910.6.

Post emergency response means that portion of an emergency response performed after the immediate threat of a release has been stabilized or eliminated and clean-up of the site has begun. If post emergency response is performed by an employer's own employees who were part of the initial emergency response, it is considered to be part of the initial response and not post emergency response. However, if a group of an employer's own employees, separate from the group providing initial response, performs the clean-up operation, then the separate group of employees would be considered to be performing post-emergency response and subject to paragraph (q)(11) of this section.

Qualified person means a person with specific training, knowledge and experience in the area for which the person has the responsibility and the authority to control.

Site safety and health supervisor (or official) means the individual located on a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.

Small quantity qenerator means a generator of hazardous wastes who in any calendar month generates no more than 1,000 kilograms (2,205 pounds) of hazardous waste in that month.

Uncontrolled hazardous waste site, means an area identified as an uncontrolled hazardous waste site by a governmental body, whether Federal,

state, local or other where an accumulation of hazardous substances creates a threat to the health and safety of individuals or the environment or both. Some sites are found on public lands such as those created by former municipal, county or state landfills where illegal or poorly managed waste disposal has taken place. Other sites are found on private property, often belonging to generators or former generators of hazardous substance wastes. Examples of such sites include, but are not limited to, surface impoundments, landfills, dumps, and tank or drum farms. Normal operations at TSD sites are not covered by this definition.

(b) *Safety and health program.*

NOTE TO (b): Safety and health programs developed and implemented to meet other Federal, state, or local regulations are considered acceptable in meeting this requirement if they cover or are modified to cover the topics required in this paragraph. An additional or separate safety and health program is not required by this paragraph.

(1) *General.* (i) Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. The program shall be designed to identify, evaluate, and control safety and health hazards, and provide for emergency response for hazardous waste operations.

(ii) The written safety and health program shall incorporate the following:

(A) An organizational structure;

(B) A comprehensive workplan;

(C) A site-specific safety and health plan which need not repeat the employer's standard operating procedures required in paragraph (b)(1)(ii)(F) of this section;

(D) The safety and health training program;

(E) The medical surveillance program;

(F) The employer's standard operating procedures for safety and health; and

(G) Any necessary interface between general program and site specific activities.

(iii) *Site excavation.* Site excavations created during initial site preparation or during hazardous waste operations shall be shored or sloped as appropriate to prevent accidental collapse in accordance with subpart P of 29 CFR part 1926.

(iv) *Contractors and sub-contractors.* An employer who retains contractor or sub-contractor services for work in hazardous waste operations shall inform those contractors, sub-contractors, or their representatives of the site emergency response procedures and any potential fire, explosion, health, safety or other hazards of the hazardous waste operation that have been identified by the employer, including those identified in the employer's information program.

(v) *Program availability.* The written safety and health program shall be made available to any contractor or subcontractor or their representative who will be involved with the hazardous waste operation; to employees; to employee designated representatives; to OSHA personnel, and to personnel of other Federal, state, or local agencies with regulatory authority over the site.

(2) *Organizational structure part of the site program*—(i) The organizational structure part of the program shall establish the specific chain of command and specify the overall responsibilities of supervisors and employees. It shall include, at a minimum, the following elements:

(A) A general supervisor who has the responsibility and authority to direct all hazardous waste operations.

(B) A site safety and health supervisor who has the responsibility and authority to develop and implement the site safety and health plan and verify compliance.

(C) All other personnel needed for hazardous waste site operations and emergency response and their general functions and responsibilities.

(D) The lines of authority, responsibility, and communication.

(ii) The organizational structure shall be reviewed and updated as necessary to reflect the current status of waste site operations.

(3) *Comprehensive workplan part of the site program.* The comprehensive workplan part of the program shall address the tasks and objectives of the

site operations and the logistics and resources required to reach those tasks and objectives.

(i) The comprehensive workplan shall address anticipated clean-up activities as well as normal operating procedures which need not repeat the employer's procedures available elsewhere.

(ii) The comprehensive workplan shall define work tasks and objectives and identify the methods for accomplishing those tasks and objectives.

(iii) The comprehensive workplan shall establish personnel requirements for implementing the plan.

(iv) The comprehensive workplan shall provide for the implementation of the training required in paragraph (e) of this section.

(v) The comprehensive workplan shall provide for the implementation of the required informational programs required in paragraph (i) of this section.

(vi) The comprehensive workplan shall provide for the implementation of the medical surveillance program described in paragraph (f) of this section.

(4) *Site-specific safety and health plan part of the program*—(i) *General.* The site safety and health plan, which must be kept on site, shall address the safety and health hazards of each phase of site operation and include the requirements and procedures for employee protection.

(ii) *Elements.* The site safety and health plan, as a minimum, shall address the following:

(A) A safety and health risk or hazard analysis for each site task and operation found in the workplan.

(B) Employee training assignments to assure compliance with paragraph (e) of this section.

(C) Personal protective equipment to be used by employees for each of the site tasks and operations being conducted as required by the personal protective equipment program in paragraph (g)(5) of this section.

(D) Medical surveillance requirements in accordance with the program in paragraph (f) of this section.

(E) Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.

(F) Site control measures in accordance with the site control program required in paragraph (d) of this section.

(G) Decontamination procedures in accordance with paragraph (k) of this section.

(H) An emergency response plan meeting the requirements of paragraph (l) of this section for safe and effective responses to emergencies, including the necessary PPE and other equipment.

(I) Confined space entry procedures.

(J) A spill containment program meeting the requirements of paragraph (j) of this section.

(iii) *Pre-entry briefing.* The site specific safety and health plan shall provide for pre-entry briefings to be held prior to initiating any site activity, and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that this plan is being followed. The information and data obtained from site characterization and analysis work required in paragraph (c) of this section shall be used to prepare and update the site safety and health plan.

(iv) *Effectiveness of site safety and health plan.* Inspections shall be conducted by the site safety and health supervisor or, in the absence of that individual, another individual who is knowledgeable in occupational safety and health, acting on behalf of the employer as necessary to determine the effectiveness of the site safety and health plan. Any deficiencies in the effectiveness of the site safety and health plan shall be corrected by the employer.

(c) *Site characterization and analysis*—(1) *General.* Hazardous waste sites shall be evaluated in accordance with this paragraph to identify specific site hazards and to determine the appropriate safety and health control procedures needed to protect employees from the identified hazards.

(2) *Preliminary evaluation.* A preliminary evaluation of a site's characteristics shall be performed prior to site entry by a qualified person in order to aid in the selection of appropriate employee protection methods prior to site entry. Immediately after initial site

entry, a more detailed evaluation of the site's specific characteristics shall be performed by a qualified person in order to further identify existing site hazards and to further aid in the selection of the appropriate engineering controls and personal protective equipment for the tasks to be performed.

(3) *Hazard identification.* All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH), or other conditions that may cause death or serious harm, shall be identified during the preliminary survey and evaluated during the detailed survey. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.

(4) *Required information.* The following information to the extent available shall be obtained by the employer prior to allowing employees to enter a site:

(i) Location and approximate size of the site.

(ii) Description of the response activity and/or the job task to be performed.

(iii) Duration of the planned employee activity.

(iv) Site topography and accessibility by air and roads.

(v) Safety and health hazards expected at the site.

(vi) Pathways for hazardous substance dispersion.

(vii) Present status and capabilities of emergency response teams that would provide assistance to hazardous waste clean-up site employees at the time of an emergency.

(viii) Hazardous substances and health hazards involved or expected at the site, and their chemical and physical properties.

(5) *Personal protective equipment.* Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:

(i) Based upon the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry which will provide protection to a level of exposure below permissible exposure limits and published exposure levels for known or suspected hazardous substances and health hazards, and which will provide protection against other known and suspected hazards identified during the preliminary site evaluation. If there is no permissible exposure limit or published exposure level, the employer may use other published studies and information as a guide to appropriate personal protective equipment.

(ii) If positive-pressure self-contained breathing apparatus is not used as part of the entry ensemble, and if respiratory protection is warranted by the potential hazards identified during the preliminary site evaluation, an escape self-contained breathing apparatus of at least five minute's duration shall be carried by employees during initial site entry.

(iii) If the preliminary site evaluation does not produce sufficient information to identify the hazards or suspected hazards of the site, an ensemble providing protection equivalent to Level B PPE shall be provided as minimum protection, and direct reading instruments shall be used as appropriate for identifying IDLH conditions. (See appendix B for a description of Level B hazards and the recommendations for Level B protective equipment.)

(iv) Once the hazards of the site have been identified, the appropriate PPE shall be selected and used in accordance with paragraph (g) of this section.

(6) *Monitoring.* The following monitoring shall be conducted during initial site entry when the site evaluation produces information that shows the potential for ionizing radiation or IDLH conditions, or when the site information is not sufficient reasonably to eliminate these possible conditions:

(i) Monitoring with direct reading instruments for hazardous levels of ionizing radiation.

(ii) Monitoring the air with appropriate direct reading test equipment (i.e., combustible gas meters, detector tubes) for IDLH and other conditions that may cause death or serious harm (combustible or explosive atmospheres, oxygen deficiency, toxic substances).

(iii) Visually observing for signs of actual or potential IDLH or other dangerous conditions.

(iv) An ongoing air monitoring program in accordance with paragraph (h) of this section shall be implemented after site characterization has determined the site is safe for the start-up of operations.

(7) *Risk identification.* Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be informed of any risks that have been identified. In situations covered by the Hazard Communication Standard, 29 CFR 1910.1200, training required by that standard need not be duplicated.

NOTE TO PARAGRAPH (c)(7). Risks to consider include, but are not limited to:

(a) Exposures exceeding the permissible exposure limits and published exposure levels.

(b) IDLH concentrations.

(c) Potential skin absorption and irritation sources.

(d) Potential eye irritation sources.

(e) Explosion sensitivity and flammability ranges.

(f) Oxygen deficiency.

(8) *Employee notification.* Any information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employee is expected to perform shall be made available to the affected employees prior to the commencement of their work activities. The employer may utilize information developed for the hazard communication standard for this purpose.

(d) *Site control*—(1) *General.* Appropriate site control procedures shall be implemented to control employee exposure to hazardous substances before clean-up work begins.

(2) *Site control program.* A site control program for protecting employees which is part of the employer's site safety and health program required in paragraph (b) of this section shall be developed during the planning stages of a hazardous waste clean-up operation and modified as necessary as new information becomes available.

(3) *Elements of the site control program.* The site control program shall, as a minimum, include: A site map; site work zones; the use of a "buddy system"; site communications including alerting means for emergencies; the standard operating procedures or safe work practices; and, identification of the nearest medical assistance. Where these requirements are covered elsewhere they need not be repeated.

(e) *Training*—(1) *General.* (i) All employees working on site (such as but not limited to equipment operators, general laborers and others) exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site shall receive training meeting the requirements of this paragraph before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall receive review training as specified in this paragraph.

(ii) Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

(2) *Elements to be covered.* The training shall thoroughly cover the following:

(i) Names of personnel and alternates responsible for site safety and health;

(ii) Safety, health and other hazards present on the site;

(iii) Use of personal protective equipment;

(iv) Work practices by which the employee can minimize risks from hazards;

(v) Safe use of engineering controls and equipment on the site;

(vi) Medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards; and

(vii) The contents of paragraphs (G) through (J) of the site safety and health plan set forth in paragraph (b)(4)(ii) of this section.

(3) *Initial training.* (i) General site workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to

hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(ii) Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geo-physical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(iii) Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(iv) Workers with 24 hours of training who are covered by paragraphs (e)(3)(ii) and (e)(3)(iii) of this section, and who become general site workers or who are required to wear respirators, shall have the additional 16 hours and two days of training necessary to total the training specified in paragraph (e)(3)(i).

(4) *Management and supervisor training.* On-site management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive 40 hours initial training, and three days of supervised field experience (the training may be reduced to 24 hours and one day if the only area of their responsibility is employees covered by paragraphs (e)(3)(ii) and (e)(3)(iii)) and at least eight additional hours of specialized training at the time of job assignment on such topics as, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques.

(5) *Qualifications for trainers.* Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.

(6) *Training certification.* Employees and supervisors that have received and successfully completed the training and field experience specified in paragraphs (e)(1) through (e)(4) of this section shall be certified by their instructor or the head instructor and trained supervisor as having successfully completed the necessary training. A written certificate shall be given to each person so certified. Any person who has not been so certified or who does not meet the requirements of paragraph (e)(9) of this section shall be prohibited from engaging in hazardous waste operations.

(7) *Emergency response.* Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies.

(8) *Refresher training.* Employees specified in paragraph (e)(1) of this section, and managers and supervisors specified in paragraph (e)(4) of this section, shall receive eight hours of refresher training annually on the items specified in paragraph (e)(2) and/or (e)(4) of this section, any critique of incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.

(9) *Equivalent training.* Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in paragraphs (e)(1) through (e)(4) of this section shall not be required to provide the initial training requirements of those paragraphs to such employees and shall provide a

copy of the certification or documentation to the employee upon request. However, certified employees or employees with equivalent training new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site work experience.

(f) *Medical surveillance*—(1) *General.* Employers engaged in operations specified in paragraphs (a)(1)(i) through (a)(1)(iv) of this section and not covered by (a)(2)(iii) exceptions and employers of employees specified in paragraph (q)(9) shall institute a medical surveillance program in accordance with this paragraph.

(2) *Employees covered.* The medical surveillance program shall be instituted by the employer for the following employees:

(i) All employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year;

(ii) All employees who wear a respirator for 30 days or more a year or as required by §1910.134;

(iii) All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation; and

(iv) Members of HAZMAT teams.

(3) *Frequency of medical examinations and consultations.* Medical examinations and consultations shall be made available by the employer to each employee covered under paragraph (f)(2) of this section on the following schedules:

(i) For employees covered under paragraphs (f)(2)(i), (f)(2)(ii), and (f)(2)(iv):

(A) Prior to assignment;

(B) At least once every twelve months for each employee covered unless the attending physician believes a longer interval (not greater than biennially) is appropriate;

(C) At termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last six months;

(D) As soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards, or that the employee has been injured or exposed above the permissible exposure limits or published exposure levels in an emergency situation;

(E) At more frequent times, if the examining physician determines that an increased frequency of examination is medically necessary.

(ii) For employees covered under paragraph (f)(2)(iii) and for all employees including those of employers covered by paragraph (a)(1)(v) who may have been injured, received a health impairment, developed signs or symptoms which may have resulted from exposure to hazardous substances resulting from an emergency incident, or exposed during an emergency incident to hazardous substances at concentrations above the permissible exposure limits or the published exposure levels without the necessary personal protective equipment being used:

(A) As soon as possible following the emergency incident or development of signs or symptoms;

(B) At additional times, if the examining physician determines that follow-up examinations or consultations are medically necessary.

(4) *Content of medical examinations and consultations.* (i) Medical examinations required by paragraph (f)(3) of this section shall include a medical and work history (or updated history if one is in the employee's file) with special emphasis on symptoms related to the handling of hazardous substances and health hazards, and to fitness for duty including the ability to wear any required PPE under conditions (i.e., temperature extremes) that may be expected at the work site.

(ii) The content of medical examinations or consultations made available to employees pursuant to paragraph (f) shall be determined by the attending physician. The guidelines in the *Occupational Safety and Health Guidance*

Manual for Hazardous Waste Site Activities (See appendix D, Reference #10) should be consulted.

(5) *Examination by a physician and costs.* All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

(6) *Information provided to the physician.* The employer shall provide one copy of this standard and its appendices to the attending physician, and in addition the following for each employee:

(i) A description of the employee's duties as they relate to the employee's exposures.

(ii) The employee's exposure levels or anticipated exposure levels.

(iii) A description of any personal protective equipment used or to be used.

(iv) Information from previous medical examinations of the employee which is not readily available to the examining physician.

(v) Information required by § 1910.134.

(7) *Physician's written opinion.* (i) The employer shall obtain and furnish the employee with a copy of a written opinion from the attending physician containing the following:

(A) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response, or from respirator use.

(B) The physician's recommended limitations upon the employee's assigned work.

(C) The results of the medical examination and tests if requested by the employee.

(D) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

(ii) The written opinion obtained by the employer shall not reveal specific findings or diagnoses unrelated to occupational exposures.

(8) *Recordkeeping.* (i) An accurate record of the medical surveillance required by paragraph (f) of this section shall be retained. This record shall be retained for the period specified and meet the criteria of 29 CFR 1910.20.

(ii) The record required in paragraph (f)(8)(i) of this section shall include at least the following information:

(A) The name and social security number of the employee;

(B) Physician's written opinions, recommended limitations, and results of examinations and tests;

(C) Any employee medical complaints related to exposure to hazardous substances;

(D) A copy of the information provided to the examining physician by the employer, with the exception of the standard and its appendices.

(g) *Engineering controls, work practices, and personal protective equipment for employee protection.* Engineering controls, work practices, personal protective equipment, or a combination of these shall be implemented in accordance with this paragraph to protect employees from exposure to hazardous substances and safety and health hazards.

(1) *Engineering controls, work practices and PPE for substances regulated in subparts G and Z.* (i) Engineering controls and work practices shall be instituted to reduce and maintain employee exposure to or below the permissible exposure limits for substances regulated by 29 CFR part 1910, to the extent required by subpart Z, except to the extent that such controls and practices are not feasible.

NOTE TO PARAGRAPH (g)(1)(i): Engineering controls which may be feasible include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices which may be feasible are removing all non-essential employees from potential exposure during opening of drums, wetting down dusty operations and locating employees upwind of possible hazards.

(ii) Whenever engineering controls and work practices are not feasible or not required, any reasonable combination of engineering controls, work practices and PPE shall be used to reduce and maintain employee exposures

to or below the permissible exposure limits or dose limits for substances regulated by 29 CFR part 1910, subpart Z.

(iii) The employer shall not implement a schedule of employee rotation as a means of compliance with permissible exposure limits or dose limits except when there is no other feasible way of complying with the airborne or dermal dose limits for ionizing radiation.

(iv) The provisions of 29 CFR, subpart G, shall be followed.

(2) *Engineering controls, work practices, and PPE for substances not regulated in subparts G and Z.* An appropriate combination of engineering controls, work practices and personal protective equipment shall be used to reduce and maintain employee exposure to or below published exposure levels for hazardous substances and health hazards not regulated by 29 CFR part 1910, subparts G and Z. The employer may use the published literature and MSDS as a guide in making the employer's determination as to what level of protection the employer believes is appropriate for hazardous substances and health hazards for which there is no permissible exposure limit or published exposure limit.

(3) *Personal protective equipment selection.* (i) Personal protective equipment (PPE) shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis.

(ii) Personal protective equipment selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

(iii) Positive pressure self-contained breathing apparatus, or positive pressure air-line respirators equipped with an escape air supply, shall be used when chemical exposure levels present will create a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

(iv) Totally-encapsulating chemical protective suits (protection equivalent to Level A protection as recommended in appendix B) shall be used in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

(v) The level of protection provided by PPE selection shall be increased when additional information on site conditions indicates that increased protection is necessary to reduce employee exposures below permissible exposure limits and published exposure levels for hazardous substances and health hazards. (See appendix B for guidance on selecting PPE ensembles.)

NOTE TO PARAGRAPH (g)(3): The level of employee protection provided may be decreased when additional information or site conditions show that decreased protection will not result in hazardous exposures to employees.

(vi) Personal protective equipment shall be selected and used to meet the requirements of 29 CFR part 1910, subpart I, and additional requirements specified in this section.

(4) *Totally-encapsulating chemical protective suits.* (i) Totally-encapsulating suits shall protect employees from the particular hazards which are identified during site characterization and analysis.

(ii) Totally-encapsulating suits shall be capable of maintaining positive air pressure. (See appendix A for a test method which may be used to evaluate this requirement.)

(iii) Totally-encapsulating suits shall be capable of preventing inward test gas leakage of more than 0.5 percent. (See appendix A for a test method which may be used to evaluate this requirement.)

(5) *Personal protective equipment (PPE) program.* A written personal protective equipment program, which is part of the employer's safety and health program required in paragraph (b) of this section or required in paragraph (p)(1) of this section and which is also a part of the site-specific safety and health plan shall be established. The PPE program shall address the elements listed below. When elements, such as donning and doffing procedures, are provided by the manufacturer of a piece of equipment and are attached to the plan, they need not be rewritten into the

plan as long as they adequately address the procedure or element.

(i) PPE selection based upon site hazards,

(ii) PPE use and limitations of the equipment,

(iii) Work mission duration,

(iv) PPE maintenance and storage,

(v) PPE decontamination and disposal,

(vi) PPE training and proper fitting,

(vii) PPE donning and doffing procedures,

(viii) PPE inspection procedures prior to, during, and after use,

(ix) Evaluation of the effectiveness of the PPE program, and

(x) Limitations during temperature extremes, heat stress, and other appropriate medical considerations.

(h) *Monitoring*—(1) *General.* (i) Monitoring shall be performed in accordance with this paragraph where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.

(ii) Air monitoring shall be used to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of employee protection needed on site.

(2) *Initial entry.* Upon initial entry, representative air monitoring shall be conducted to identify any IDLH condition, exposure over permissible exposure limits or published exposure levels, exposure over a radioactive material's dose limits or other dangerous condition such as the presence of flammable atmospheres or oxygen-deficient environments.

(3) *Periodic monitoring.* Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen over permissible exposure limits or published exposure levels since prior monitoring. Situations where it shall be considered whether the possibility that exposures have risen are as follows:

(i) When work begins on a different portion of the site.

(ii) When contaminants other than those previously identified are being handled.

(iii) When a different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling).

(iv) When employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon).

(4) *Monitoring of high-risk employees.* After the actual clean-up phase of any hazardous waste operation commences; for example, when soil, surface water or containers are moved or disturbed; the employer shall monitor those employees likely to have the highest exposures to hazardous substances and health hazards likely to be present above permissible exposure limits or published exposure levels by using personal sampling frequently enough to characterize employee exposures. If the employees likely to have the highest exposure are over permissible exposure limits or published exposure limits, then monitoring shall continue to determine all employees likely to be above those limits. The employer may utilize a representative sampling approach by documenting that the employees and chemicals chosen for monitoring are based on the criteria stated above.

NOTE TO PARAGRAPH (h): It is not required to monitor employees engaged in site characterization operations covered by paragraph (c) of this section.

(i) *Informational programs.* Employers shall develop and implement a program, which is part of the employer's safety and health program required in paragraph (b) of this section, to inform employees, contractors, and subcontractors (or their representative) actually engaged in hazardous waste operations of the nature, level and degree of exposure likely as a result of participation in such hazardous waste operations. Employees, contractors and subcontractors working outside of the operations part of a site are not covered by this standard.

(j) *Handling drums and containers*—(1) *General.* (i) Hazardous substances and contaminated soils, liquids, and other

residues shall be handled, transported, labeled, and disposed of in accordance with this paragraph.

(ii) Drums and containers used during the clean-up shall meet the appropriate DOT, OSHA, and EPA regulations for the wastes that they contain.

(iii) When practical, drums and containers shall be inspected and their integrity shall be assured prior to being moved. Drums or containers that cannot be inspected before being moved because of storage conditions (i.e., buried beneath the earth, stacked behind other drums, stacked several tiers high in a pile, etc.) shall be moved to an accessible location and inspected prior to further handling.

(iv) Unlabelled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

(v) Site operations shall be organized to minimize the amount of drum or container movement.

(vi) Prior to movement of drums or containers, all employees exposed to the transfer operation shall be warned of the potential hazards associated with the contents of the drums or containers.

(vii) U.S. Department of Transportation specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spills, leaks, or ruptures may occur.

(viii) Where major spills may occur, a spill containment program, which is part of the employer's safety and health program required in paragraph (b) of this section, shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

(ix) Drums and containers that cannot be moved without rupture, leakage, or spillage shall be emptied into a sound container using a device classified for the material being transferred.

(x) A ground-penetrating system or other type of detection system or device shall be used to estimate the location and depth of buried drums or containers.

(xi) Soil or covering material shall be removed with caution to prevent drum or container rupture.

(xii) Fire extinguishing equipment meeting the requirements of 29 CFR part 1910, subpart L, shall be on hand and ready for use to control incipient fires.

(2) *Opening drums and containers.* The following procedures shall be followed in areas where drums or containers are being opened:

(i) Where an airline respirator system is used, connections to the source of air supply shall be protected from contamination and the entire system shall be protected from physical damage.

(ii) Employees not actually involved in opening drums or containers shall be kept a safe distance from the drums or containers being opened.

(iii) If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation shall be placed between the employee and the drums or containers being opened to protect the employee in case of accidental explosion.

(iv) Controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment shall be located behind the explosion-resistant barrier.

(v) When there is a reasonable possibility of flammable atmospheres being present, material handling equipment and hand tools shall be of the type to prevent sources of ignition.

(vi) Drums and containers shall be opened in such a manner that excess interior pressure will be safely relieved. If pressure can not be relieved from a remote location, appropriate shielding shall be placed between the employee and the drums or containers to reduce the risk of employee injury.

(vii) Employees shall not stand upon or work from drums or containers.

(3) *Material handling equipment.* Material handiing equipment used to transfer drums and containers shall be selected, positioned and operated to minimize sources of ignition related to the equipment from igniting vapors released from ruptured drums or containers.

(4) *Radioactive wastes.* Drums and containers containing radioactive wastes shall not be handled until such time as their hazard to employees is properly assessed.

(5) *Shock sensitive wastes.* As a minimum, the following special precautions shall be taken when drums and containers containing or suspected of containing shock-sensitive wastes are handled:

(i) All non-essential employees shall be evacuated from the area of transfer.

(ii) Material handling equipment shall be provided with explosive containment devices or protective shields to protect equipment operators from exploding containers.

(iii) An employee alarm system capable of being perceived above surrounding light and noise conditions shall be used to signal the commencement and completion of explosive waste handling activities.

(iv) Continuous communications (i.e., portable radios, hand signals, telephones, as appropriate) shall be maintained between the employee-in-charge of the immediate handling area and both the site safety and health supervisor and the command post until such time as the handling operation is completed. Communication equipment or methods that could cause shock sensitive materials to explode shall not be used.

(v) Drums and containers under pressure, as evidenced by bulging or swelling, shall not be moved until such time as the cause for excess pressure is determined and appropriate containment procedures have been implemented to protect employees from explosive relief of the drum.

(vi) Drums and containers containing packaged laboratory wastes shall be considered to contain shock-sensitive or explosive materials until they have been characterized.

CAUTION: Shipping of shock sensitive wastes may be prohibited under U.S. Department of Transportation regulations. Employers and their shippers should refer to 49 CFR 173.21 and 173.50.

(6) *Laboratory waste packs.* In addition to the requirements of paragraph (j)(5) of this section, the following precautions shall be taken, as a minimum, in handling laboratory waste packs (lab packs):

(i) Lab packs shall be opened only when necessary and then only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack according to the hazards of the wastes.

(ii) If crystalline material is noted on any container, the contents shall be handled as a shock-sensitive waste until the contents are identified.

(7) *Sampling of drum and container contents.* Sampling of containers and drums shall be done in accordance with a sampling procedure which is part of the site safety and health plan developed for and available to employees and others at the specific worksite.

(8) *Shipping and transport.* (i) Drums and containers shall be identified and classified prior to packaging for shipment.

(ii) Drum or container staging areas shall be kept to the minimum number necessary to identify and classify materials safely and prepare them for transport.

(iii) Staging areas shall be provided with adequate access and egress routes.

(iv) Bulking of hazardous wastes shall be permitted only after a thorough characterization of the materials has been completed.

(9) *Tank and vault procedures.* (i) Tanks and vaults containing hazardous substances shall be handled in a manner similar to that for drums and containers, taking into consideration the size of the tank or vault.

(ii) Appropriate tank or vault entry procedures as described in the employer's safety and health plan shall be followed whenever employees must enter a tank or vault.

(k) *Decontamination*—(1) *General.* Procedures for all phases of decontamination shall be developed and implemented in accordance with this paragraph.

(2) *Decontamination procedures.* (i) A decontamination procedure shall be developed, communicated to employees and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.

(ii) Standard operating procedures shall be developed to minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances.

(iii) All employees leaving a contaminated area shall be appropriately decontaminated; all contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.

(iv) Decontamination procedures shall be monitored by the site safety and health supervisor to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.

(3) *Location.* Decontamination shall be performed in geographical areas that will minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment.

(4) *Equipment and solvents.* All equipment and solvents used for decontamination shall be decontaminated or disposed of properly.

(5) *Personal protective clothing and equipment.* (i) Protective clothing and equipment shall be decontaminated, cleaned, laundered, maintained or replaced as needed to maintain their effectiveness.

(ii) Employees whose non-impermeable clothing becomes wetted with hazardous substances shall immediately remove that clothing and proceed to shower. The clothing shall be disposed of or decontaminated before it is removed from the work zone.

(6) *Unauthorized employees.* Unauthorized employees shall not remove protective clothing or equipment from change rooms.

(7) *Commercial laundries or cleaning establishments.* Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be informed of the potentially harmful effects of exposures to hazardous substances.

(8) *Showers and change rooms.* Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided and meet the requirements of 29 CFR 1910.141. If temperature conditions prevent the effective use of water, then other effective means for cleansing shall be provided and used.

(l) *Emergency response by employees at uncontrolled hazardous waste sites*—(1) *Emergency response plan.* (i) An emergency response plan shall be developed and implemented by all employers within the scope of paragraphs (a)(1)(i)–(ii) of this section to handle anticipated emergencies prior to the commencement of hazardous waste operations. The plan shall be in writing and available for inspection and copying by employees, their representatives, OSHA personnel and other governmental agencies with relevant responsibilities.

(ii) Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this paragraph if they provide an emergency action plan complying with 29 CFR 1910.38.

(2) *Elements of an emergency response plan.* The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following:

(i) Pre-emergency planning.

(ii) Personnel roles, lines of authority, and communication.

(iii) Emergency recognition and prevention.

(iv) Safe distances and places of refuge.

(v) Site security and control.

(vi) Evacuation routes and procedures.

(vii) Decontamination procedures which are not covered by the site safety and health plan.

(viii) Emergency medical treatment and first aid.

(ix) Emergency alerting and response procedures.

(x) Critique of response and follow-up.

(xi) PPE and emergency equipment.

(3) *Procedures for handling emergency incidents.* (i) In addition to the elements for the emergency response plan required in paragraph (l)(2) of this section, the following elements shall be included for emergency response plans:

(A) Site topography, layout, and prevailing weather conditions.

(B) Procedures for reporting incidents to local, state, and federal governmental agencies.

(ii) The emergency response plan shall be a separate section of the Site Safety and Health Plan.

(iii) The emergency response plan shall be compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.

(iv) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(v) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.

(vi) An employee alarm system shall be installed in accordance with 29 CFR 1910.165 to notify employees of an emergency situation; to stop work activities if necessary; to lower background noise in order to speed communication; and to begin emergency procedures.

(vii) Based upon the information available at time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the site emergency response plan.

(m) *Illumination.* Areas accessible to employees shall be lighted to not less than the minimum illumination intensities listed in the following Table H-120.1 while any work is in progress:

TABLE H–120.1—MINIMUM ILLUMINATION INTENSITIES IN FOOT-CANDLES

Foot-candles	Area or operations
5	General site areas.
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	Indoors: Warehouses, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas. (Exception: Minimum of 10 foot-candles is required at tunnel and shaft heading during drilling mucking, and scaling. Mine Safety and Health Administration approved cap lights shall be acceptable for use in the tunnel heading.)
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.)
30	First aid stations, infirmaries, and offices.

(n) *Sanitation at temporary workplaces*—(1) *Potable water.* (i) An adequate supply of potable water shall be provided on the site.

(ii) Portable containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap. Water shall not be dipped from containers.

(iii) Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

(iv) Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

(2) *Nonpotable water.* (i) Outlets for nonpotable water, such as water for firefighting purposes, shall be identified to indicate clearly that the water is unsafe and is not to be used for drinking, washing, or cooking purposes.

(ii) There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing nonpotable water.

(3) *Toilet facilities.* (i) Toilets shall be provided for employees according to the following Table H-120.2.

TABLE H–120.2—TOILET FACILITIES

Number of employees	Minimum number of facilities
20 or fewer	One.
More than 20, fewer than 200	One toilet seat and one urinal per 40 employees.
More than 200	One toilet seat and one urinal per 50 employees.

(ii) Under temporary field conditions, provisions shall be made to assure that at least one toilet facility is available.

(iii) Hazardous waste sites not provided with a sanitary sewer shall be provided with the following toilet facilities unless prohibited by local codes:

(A) Chemical toilets;

(B) Recirculating toilets;

(C) Combustion toilets; or

(D) Flush toilets.

(iv) The requirements of this paragraph for sanitation facilities shall not apply to mobile crews having transportation readily available to nearby toilet facilities.

(v) Doors entering toilet facilities shall be provided with entrance locks controlled from inside the facility.

(4) *Food handling.* All food service facilities and operations for employees shall meet the applicable laws, ordinances, and regulations of the jurisdictions in which they are located.

(5) *Temporary sleeping quarters.* When temporary sleeping quarters are provided, they shall be heated, ventilated, and lighted.

(6) *Washing facilities.* The employer shall provide adequate washing facilities for employees engaged in operations where hazardous substances may be harmful to employees. Such facilities shall be in near proximity to the worksite; in areas where exposures are below permissible exposure limits and published exposure levels and which are under the controls of the employer; and shall be so equipped as to enable employees to remove hazardous substances from themselves.

(7) *Showers and change rooms.* When hazardous waste clean-up or removal operations commence on a site and the duration of the work will require six months or greater time to complete, the employer shall provide showers and change rooms for all employees exposed to hazardous substances and health hazards involved in hazardous waste clean-up or removal operations.

(i) Showers shall be provided and shall meet the requirements of 29 CFR 1910.141(d)(3).

(ii) Change rooms shall be provided and shall meet the requirements of 29 CFR 1910.141(e). Change rooms shall consist of two separate change areas separated by the shower area required in paragraph (n)(7)(i) of this section. One change area, with an exit leading off the worksite, shall provide employees with a clean area where they can remove, store, and put on street clothing. The second area, with an exit to the worksite, shall provide employees with an area where they can put on, remove and store work clothing and personal protective equipment.

(iii) Showers and change rooms shall be located in areas where exposures are below the permissible exposure limits and published exposure levels. If this cannot be accomplished, then a ventilation system shall be provided that will supply air that is below the permissible exposure limits and published exposure levels.

(iv) Employers shall assure that employees shower at the end of their work shift and when leaving the hazardous waste site.

(o) *New technology programs.* (1) The employer shall develop and implement procedures for the introduction of effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean-up operations, and the same shall be implemented as part of the site safety and health program to assure that employee protection is being maintained.

(2) New technologies, equipment or control measures available to the industry, such as the use of foams, absorbents, adsorbents, neutralizers, or other means to suppress the level of air contaminates while excavating the site or for spill control, shall be evaluated by employers or their representatives. Such an evaluation shall be done to determine the effectiveness of the new methods, materials, or equipment before implementing their use on a large scale for enhancing employee protection. Information and data from manufacturers or suppliers may be used as part of the employer's evaluation effort. Such evaluations shall be made available to OSHA upon request.

(p) *Certain Operations Conducted Under the Resource Conservation and Recovery Act of 1976 (RCRA).* Employers conducting operations at treatment, storage and disposal (TSD) facilities specified in paragraph (a)(1)(iv) of this section shall provide and implement the programs specified in this paragraph. See the "Notes and Exceptions" to paragraph (a)(2)(iii) of this section for employers not covered.)".

(1) *Safety and health program.* The employer shall develop and implement a written safety and health program for employees involved in hazardous waste operations that shall be available for inspection by employees, their representatives and OSHA personnel. The program shall be designed to identify, evaluate and control safety and health hazards in their facilities for the purpose of employee protection, to provide for emergency response meeting the requirements of paragraph (p)(8) of this section and to address as appropriate site analysis, engineering controls,

maximum exposure limits, hazardous waste handling procedures and uses of new technologies.

(2) *Hazard communication program.* The employer shall implement a hazard communication program meeting the requirements of 29 CFR 1910.1200 as part of the employer's safety and program.

NOTE TO §1910.120: The exemption for hazardous waste provided in §1910.1200 is applicable to this section.

(3) *Medical surveillance program.* The employer shall develop and implement a medical surveillance program meeting the requirements of paragraph (f) of this section.

(4) *Decontamination program.* The employer shall develop and implement a decontamination procedure meeting the requirements of paragraph (k) of this section.

(5) *New technology program.* The employer shall develop and implement procedures meeting the requirements of paragraph (o) of this section for introducing new and innovative equipment into the workplace.

(6) *Material handling program.* Where employees will be handling drums or containers, the employer shall develop and implement procedures meeting the requirements of paragraphs (j)(1) (ii) through (viii) and (xi) of this section, as well as (j)(3) and (j)(8) of this section prior to starting such work.

(7) *Training program*—(i) *New employees.* The employer shall develop and implement a training program, which is part of the employer's safety and health program, for employees exposed to health hazards or hazardous substances at TSD operations to enable the employees to perform their assigned duties and functions in a safe and healthful manner so as not endanger themselves or other employees. The initial training shall be for 24 hours and refresher training shall be for eight hours annually. Employees who have received the initial training required by this paragraph shall be given a written certificate attesting that they have successfully completed the necessary training.

(ii) *Current employees.* Employers who can show by an employee's previous work experience and/or training that the employee has had training equivalent to the initial training required by this paragraph, shall be considered as meeting the initial training requirements of this paragraph as to that employee. Equivalent training includes the training that existing employees might have already received from actual site work experience. Current employees shall receive eight hours of refresher training annually.

(iii) *Trainers.* Trainers who teach initial training shall have satisfactorily completed a training course for teaching the subjects they are expected to teach or they shall have the academic credentials and instruction experience necessary to demonstrate a good command of the subject matter of the courses and competent instructional skills.

(8) *Emergency response program*—(i) *Emergency response plan.* An emergency response plan shall be developed and implemented by all employers. Such plans need not duplicate any of the subjects fully addressed in the employer's contingency planning required by permits, such as those issued by the U.S. Environmental Protection Agency, provided that the contingency plan is made part of the emergency response plan. The emergency response plan shall be a written portion of the employer's safety and health program required in paragraph (p)(1) of this section. Employers who will evacuate their employees from the worksite location when an emergency occurs and who do not permit any of their employees to assist in handling the emergency are exempt from the requirements of paragraph (p)(8) if they provide an emergency action plan complying with 29 CFR 1910.38.

(ii) *Elements of an emergency response plan.* The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following areas to the extent that they are not addressed in any specific program required in this paragraph:

(A) Pre-emergency planning and coordination with outside parties.

(B) Personnel roles, lines of authority, and communication.

(C) Emergency recognition and prevention.

(D) Safe distances and places of refuge.

(E) Site security and control.

(F) Evacuation routes and procedures.

(G) Decontamination procedures.

(H) Emergency medical treatment and first aid.

(I) Emergency alerting and response procedures.

(J) Critique of response and follow-up.

(K) PPE and emergency equipment.

(iii) *Training.* (A) Training for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such training shall include the elements of the emergency response plan, standard operating procedures the employer has established for the job, the personal protective equipment to be worn and procedures for handling emergency incidents.

Exception #1: An employer need not train all employees to the degree specified if the employer divides the work force in a manner such that a sufficient number of employees who have responsibility to control emergencies have the training specified, and all other employees, who may first respond to an emergency incident, have sufficient awareness training to recognize that an emergency response situation exists and that they are instructed in that case to summon the fully trained employees and not attempt control activities for which they are not trained.

Exception #2: An employer need not train all employees to the degree specified if arrangements have been made in advance for an outside fully-trained emergency response team to respond in a reasonable period and all employees, who may come to the incident first, have sufficient awareness training to recognize that an emergency response situation exists and they have been instructed to call the designated outside fully-trained emergency response team for assistance.

(B) Employee members of TSD facility emergency response organizations shall be trained to a level of competence in the recognition of health and safety hazards to protect themselves and other employees. This would include training in the methods used to minimize the risk from safety and health hazards; in the safe use of control equipment; in the selection and use of appropriate personal protective equipment; in the safe operating procedures to be used at the incident scene; in the techniques of coordination with other employees to minimize risks; in the appropriate response to over exposure from health hazards or injury to themselves and other employees; and in the recognition of subsequent symptoms which may result from over exposures.

(C) The employer shall certify that each covered employee has attended and successfully completed the training required in paragraph (p)(8)(iii) of this section, or shall certify the employee's competency at least yearly. The method used to demonstrate competency for certification of training shall be recorded and maintained by the employer.

(iv) *Procedures for handling emergency incidents.* (A) In addition to the elements for the emergency response plan required in paragraph (p)(8)(ii) of this section, the following elements shall be included for emergency response plans to the extent that they do not repeat any information already contained in the emergency response plan:

(*1*) Site topography, layout, and prevailing weather conditions.

(*2*) Procedures for reporting incidents to local, state, and federal governmental agencies.

(B) The emergency response plan shall be compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.

(C) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(D) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.

(E) An employee alarm system shall be installed in accordance with 29 CFR 1910.165 to notify employees of an emergency situation; to stop work activities if necessary; to lower background noise in order to speed communication; and to begin emergency procedures.

(F) Based upon the information available at time of the emergency, the employer shall evaluate the incident and

the site response capabilities and proceed with the appropriate steps to implement the site emergency response plan.

(q) *Emergency response to hazardous substance releases.* This paragraph covers employers whose employees are engaged in emergency response no matter where it occurs except that it does not cover employees engaged in operations specified in paragraphs (a)(1)(i) through (a)(1)(iv) of this section. Those emergency response organizations who have developed and implemented programs equivalent to this paragraph for handling releases of hazardous substances pursuant to section 303 of the Superfund Amendments and Reauthorization Act of 1986 (Emergency Planning and Community Right-to-Know Act of 1986, 42 U.S.C. 11003) shall be deemed to have met the requirements of this paragraph.

(1) *Emergency response plan.* An emergency response plan shall be developed and implemented to handle anticipated emergencies prior to the commencement of emergency response operations. The plan shall be in writing and available for inspection and copying by employees, their representatives and OSHA personnel. Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this paragraph if they provide an emergency action plan in accordance with 29 CFR 1910.38.

(2) *Elements of an emergency response plan.* The employer shall develop an emergency response plan for emergencies which shall address, as a minimum, the following to the extent that they are not addressed elsewhere:

(i) Pre-emergency planning and coordination with outside parties.

(ii) Personnel roles, lines of authority, training, and communication.

(iii) Emergency recognition and prevention.

(iv) Safe distances and places of refuge.

(v) Site security and control.

(vi) Evacuation routes and procedures.

(vii) Decontamination.

(viii) Emergency medical treatment and first aid.

(ix) Emergency alerting and response procedures.

(x) Critique of response and follow-up.

(xi) PPE and emergency equipment.

(xii) Emergency response organizations may use the local emergency response plan or the state emergency response plan or both, as part of their emergency response plan to avoid duplication. Those items of the emergency response plan that are being properly addressed by the SARA Title III plans may be substituted into their emergency plan or otherwise kept together for the employer and employee's use.

(3) *Procedures for handling emergency response.* (i) The senior emergency response official responding to an emergency shall become the individual in charge of a site-specific Incident Command System (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer.

NOTE TO PARAGRAPH (q)(3)(i). The "senior official" at an emergency response is the most senior official on the site who has the responsibility for controlling the operations at the site. Initially it is the senior officer on the first-due piece of responding emergency apparatus to arrive on the incident scene. As more senior officers arrive (i.e., battalion chief, fire chief, state law enforcement official, site coordinator, etc.) the position is passed up the line of authority which has been previously established.

(ii) The individual in charge of the ICS shall identify, to the extent possible, all hazardous substances or conditions present and shall address as appropriate site analysis, use of engineering controls, maximum exposure limits, hazardous substance handling procedures, and use of any new technologies.

(iii) Based on the hazardous substances and/or conditions present, the individual in charge of the ICS shall implement appropriate emergency operations, and assure that the personal protective equipment worn is appropriate for the hazards to be encountered. However, personal protective equipment shall meet, at a minimum,

the criteria contained in 29 CFR 1910.156(e) when worn while performing fire fighting operations beyond the incipient stage for any incident.

(iv) Employees engaged in emergency response and exposed to hazardous substances presenting an inhalation hazard or potential inhalation hazard shall wear positive pressure self-contained breathing apparatus while engaged in emergency response, until such time that the individual in charge of the ICS determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposures to employees.

(v) The individual in charge of the ICS shall limit the number of emergency response personnel at the emergency site, in those areas of potential or actual exposure to incident or site hazards, to those who are actively performing emergency operations. However, operations in hazardous areas shall be performed using the buddy system in groups of two or more.

(vi) Back-up personnel shall stand by with equipment ready to provide assistance or rescue. Advance first aid support personnel, as a minimum, shall also stand by with medical equipment and transportation capability.

(vii) The individual in charge of the ICS shall designate a safety official, who is knowledgable in the operations being implemented at the emergency response site, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

(viii) When activities are judged by the safety official to be an IDLH condition 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.

(ix) After emergency operations have terminated, the individual in charge of the ICS shall implement appropriate decontamination procedures.

(x) When deemed necessary for meeting the tasks at hand, approved self-contained compressed air breathing apparatus may be used with approved cylinders from other approved self-contained compressed air breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet U.S. Department of Transportation and National Institute for Occupational Safety and Health criteria.

(4) *Skilled support personnel.* Personnel, not necessarily an employer's own employees, who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work that cannot reasonably be performed in a timely fashion by an employer's own employees, and who will be or may be exposed to the hazards at an emergency response scene, are not required to meet the training required in this paragraph for the employer's regular employees. However, these personnel shall be given an initial briefing at the site prior to their participation in any emergency response. The initial briefing shall include instruction in the wearing of appropriate personal protective equipment, what chemical hazards are involved, and what duties are to be performed. All other appropriate safety and health precautions provided to the employer's own employees shall be used to assure the safety and health of these personnel.

(5) *Specialist employees.* Employees who, in the course of their regular job duties, work with and are trained in the hazards of specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident to the individual in charge, shall receive training or demonstrate competency in the area of their specialization annually.

(6) *Training.* Training shall be based on the duties and function to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders, those hired after the effective date of this standard, shall be

conveyed to them through training before they are permitted to take part in actual emergency operations on an incident. Employees who participate, or are expected to participate, in emergency response, shall be given training in accordance with the following paragraphs:

(i) *First responder awareness level.* First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

(A) An understanding of what hazardous substances are, and the risks associated with them in an incident.

(B) An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.

(C) The ability to recognize the presence of hazardous substances in an emergency.

(D) The ability to identify the hazardous substances, if possible.

(E) An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.

(F) The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.

(ii) *First responder operations level.* First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:

(A) Knowledge of the basic hazard and risk assessment techniques.

(B) Know how to select and use proper personal protective equipment provided to the first responder operational level.

(C) An understanding of basic hazardous materials terms.

(D) Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.

(E) Know how to implement basic decontamination procedures.

(F) An understanding of the relevant standard operating procedures and termination procedures.

(iii) *Hazardous materials technician.* Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance. Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

(A) Know how to implement the employer's emergency response plan.

(B) Know the classification, identification and verification of known and unknown materials by using field survey instruments and equipment.

(C) Be able to function within an assigned role in the Incident Command System.

(D) Know how to select and use proper specialized chemical personal protective equipment provided to the hazardous materials technician.

(E) Understand hazard and risk assessment techniques.

(F) Be able to perform advance control, containment, and/or confinement

operations within the capabilities of the resources and personal protective equipment available with the unit.

(G) Understand and implement decontamination procedures.

(H) Understand termination procedures.

(I) Understand basic chemical and toxicological terminology and behavior.

(iv) *Hazardous materials specialist.* Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with Federal, state, local and other government authorities in regards to site activities. Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas and the employer shall so certify:

(A) Know how to implement the local emergency response plan.

(B) Understand classification, identification and verification of known and unknown materials by using advanced survey instruments and equipment.

(C) Know of the state emergency response plan.

(D) Be able to select and use proper specialized chemical personal protective equipment provided to the hazardous materials specialist.

(E) Understand in-depth hazard and risk techniques.

(F) Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available.

(G) Be able to determine and implement decontamination procedures.

(H) Have the ability to develop a site safety and control plan.

(I) Understand chemical, radiological and toxicological terminology and behavior.

(v) *On scene incident commander.* Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

(A) Know and be able to implement the employer's incident command system.

(B) Know how to implement the employer's emergency response plan.

(C) Know and understand the hazards and risks associated with employees working in chemical protective clothing.

(D) Know how to implement the local emergency response plan.

(E) Know of the state emergency response plan and of the Federal Regional Response Team.

(F) Know and understand the importance of decontamination procedures.

(7) *Trainers.* Trainers who teach any of the above training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, such as the courses offered by the U.S. National Fire Academy, or they shall have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject matter of the courses they are to teach.

(8) *Refresher training.* (i) Those employees who are trained in accordance with paragraph (q)(6) of this section shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas at least yearly.

(ii) A statement shall be made of the training or competency, and if a statement of competency is made, the employer shall keep a record of the methodology used to demonstrate competency.

(9) *Medical surveillance and consultation.* (i) Members of an organized and designated HAZMAT team and hazardous materials specialists shall receive a baseline physical examination and be provided with medical surveillance as required in paragraph (f) of this section.

(ii) Any emergency response employees who exhibits signs or symptoms

which may have resulted from exposure to hazardous substances during the course of an emergency incident, either immediately or subsequently, shall be provided with medical consultation as required in paragraph (f)(3)(ii) of this section.

(10) *Chemical protective clothing.* Chemical protective clothing and equipment to be used by organized and designated HAZMAT team members, or to be used by hazardous materials specialists, shall meet the requirements of paragraphs (g) (3) through (5) of this section.

(11) *Post-emergency response operations.* Upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards, and materials contaminated with them (such as contaminated soil or other elements of the natural environment) from the site of the incident, the employer conducting the clean-up shall comply with one of the following:

(i) Meet all of the requirements of paragraphs (b) through (o) of this section; or

(ii) Where the clean-up is done on plant property using plant or workplace employees, such employees shall have completed the training requirements of the following: 29 CFR 1910.38, 1910.134, 1910.1200, and other appropriate safety and health training made necessary by the tasks they are expected to perform such as personal protective equipment and decontamination procedures. All equipment to be used in the performance of the clean-up work shall be in serviceable condition and shall have been inspected prior to use.

APPENDICES TO § 1910.120—HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE

NOTE: The following appendices serve as non-mandatory guidelines to assist employees and employers in complying with the appropriate requirements of this section. However paragraph 1910.120(g) makes mandatory in certain circumstances the use of Level A and Level B PPE protection.

APPENDIX A TO § 1910.120—PERSONAL PROTECTIVE EQUIPMENT TEST METHODS

This appendix sets forth the non-mandatory examples of tests which may be used to evaluate compliance with § 1910.120 (g)(4) (ii) and (iii). Other tests and other challenge agents may be used to evaluate compliance.

A. Totally-encapsulating chemical protective suit pressure test

1.0—Scope

1.1 This practice measures the ability of a gas tight totally-encapsulating chemical protective suit material, seams, and closures to maintain a fixed positive pressure. The results of this practice allow the gas tight integrity of a totally-encapsulating chemical protective suit to be evaluated.

1.2 Resistance of the suit materials to permeation, penetration, and degradation by specific hazardous substances is not determined by this test method.

2.0—Definition of terms

2.1 *Totally-encapsulated chemical protective suit (TECP suit)* means a full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, legs and respirator; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer and respirator by itself or in combination with the wearer's gloves and boots.

2.2 *Protective clothing material* means any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

2.3 *Gas tight* means, for the purpose of this test method, the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

3.0—Summary of test method

3.1 The TECP suit is visually inspected and modified for the test. The test apparatus is attached to the suit to permit inflation to the pre-test suit expansion pressure for removal of suit wrinkles and creases. The pressure is lowered to the test pressure and monitored for three minutes. If the pressure drop is excessive, the TECP suit fails the test and is removed from service. The test is repeated after leak location and repair.

4.0—Required Supplies

4.1 Source of compressed air.

4.2 Test apparatus for suit testing, including a pressure measurement device with a sensitivity of at least ¼ inch water gauge.

4.3 Vent valve closure plugs or sealing tape.

4.4 Soapy water solution and soft brush.

4.5 Stop watch or appropriate timing device.

5.0—Safety Precautions

5.1 Care shall be taken to provide the correct pressure safety devices required for the source of compressed air used.

6.0—Test Procedure

6.1 Prior to each test, the tester shall perform a visual inspection of the suit. Check

the suit for seam integrity by visually examining the seams and gently pulling on the seams. Ensure that all air supply lines, fittings, visor, zippers, and valves are secure and show no signs of deterioration.

6.1.1 Seal off the vent valves along with any other normal inlet or exhaust points (such as umbilical air line fittings or face piece opening) with tape or other appropriate means (caps, plugs, fixture, etc.). Care should be exercised in the sealing process not to damage any of the suit components.

6.1.2 Close all closure assemblies.

6.1.3 Prepare the suit for inflation by providing an improvised connection point on the suit for connecting an airline. Attach the pressure test apparatus to the suit to permit suit inflation from a compressed air source equipped with a pressure indicating regulator. The leak tightness of the pressure test apparatus should be tested before and after each test by closing off the end of the tubing attached to the suit and assuring a pressure of three inches water gauge for three minutes can be maintained. If a component is removed for the test, that component shall be replaced and a second test conducted with another component removed to permit a complete test of the ensemble.

6.1.4 The pre-test expansion pressure (A) and the suit test pressure (B) shall be supplied by the suit manufacturer, but in no case shall they be less than: (A)=three inches water gauge; and (B)=two inches water gauge. The ending suit pressure (C) shall be no less than 80 percent of the test pressure (B); i.e., the pressure drop shall not exceed 20 percent of the test pressure (B).

6.1.5 Inflate the suit until the pressure inside is equal to pressure (A), the pre-test expansion suit pressure. Allow at least one minute to fill out the wrinkles in the suit. Release sufficient air to reduce the suit pressure to pressure (B), the suit test pressure. Begin timing. At the end of three minutes, record the suit pressure as pressure (C), the ending suit pressure. The difference between the suit test pressure and the ending suit test pressure (B–C) shall be defined as the suit pressure drop.

6.1.6 If the suit pressure drop is more than 20 percent of the suit test pressure (B) during the three-minute test period, the suit fails the test and shall be removed from service.

7.0—Retest Procedure

7.1 If the suit fails the test check for leaks by inflating the suit to pressure (A) and brushing or wiping the entire suit (including seams, closures, lens gaskets, glove-to-sleeve joints, etc.) with a mild soap and water solution. Observe the suit for the formation of soap bubbles, which is an indication of a leak. Repair all identified leaks.

7.2 Retest the TECP suit as outlined in Test procedure 6.0.

8.0—Report

8.1 Each TECP suit tested by this practice shall have the following information recorded:

8.1.1 Unique identification number, identifying brand name, date of purchase, material of construction, and unique fit features, e.g., special breathing apparatus.

8.1.2 The actual values for test pressures (A), (B), and (C) shall be recorded along with the specific observation times. If the ending pressure (C) is less than 80 percent of the test pressure (B), the suit shall be identified as failing the test. When possible, the specific leak location shall be identified in the test records. Retest pressure data shall be recorded as an additional test.

8.1.3 The source of the test apparatus used shall be identified and the sensitivity of the pressure gauge shall be recorded.

8.1.4 Records shall be kept for each pressure test even if repairs are being made at the test location.

CAUTION

Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked.

Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

B. Totally-encapsulating chemical protective suit qualitative leak test

1.0—Scope

1.1 This practice semi-qualitatively tests gas tight totally-encapsulating chemical protective suit integrity by detecting inward leakage of ammonia vapor. Since no modifications are made to the suit to carry out this test, the results from this practice provide a realistic test for the integrity of the entire suit.

1.2 Resistance of the suit materials to permeation, penetration, and degradation is not determined by this test method. ASTM test methods are available to test suit materials for these characteristics and the tests are usually conducted by the manufacturers of the suits.

2.0—Definition of terms

2.1 *Totally-encapsulated chemical protective suit (TECP suit)* means a full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, legs and respirator; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer and respirator by itself or in combination with the wearer's gloves, and boots.

2.2 *Protective clothing material* means any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact

with a potentially hazardous liquid or gaseous chemicals.

2.3 *Gas tight* means, for the purpose of this test method, the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

2.4 *Intrusion Coefficient* means a number expressing the level of protection provided by a gas tight totally-encapsulating chemical protective suit. The intrusion coefficient is calculated by dividing the test room challenge agent concentration by the concentration of challenge agent found inside the suit. The accuracy of the intrusion coefficient is dependent on the challenge agent monitoring methods. The larger the intrusion coefficient the greater the protection provided by the TECP suit.

3.0—Summary of recommended practice

3.1 The volume of concentrated aqueous ammonia solution (ammonia hydroxide NH_4 OH) required to generate the test atmosphere is determined using the directions outlined in 6.1. The suit is donned by a person wearing the appropriate respiratory equipment (either a positive pressure self-contained breathing apparatus or a positive pressure supplied air respirator) and worn inside the enclosed test room. The concentrated aqueous ammonia solution is taken by the suited individual into the test room and poured into an open plastic pan. A two-minute evaporation period is observed before the test room concentration is measured, using a high range ammonia length of stain detector tube. When the ammonia vapor reaches a concentration of between 1000 and 1200 ppm, the suited individual starts a standardized exercise protocol to stress and flex the suit. After this protocol is completed, the test room concentration is measured again. The suited individual exits the test room and his stand-by person measures the ammonia concentration inside the suit using a low range ammonia length of stain detector tube or other more sensitive ammonia detector. A stand-by person is required to observe the test individual during the test procedure; aid the person in donning and doffing the TECP suit; and monitor the suit interior. The intrusion coefficient of the suit can be calculated by dividing the average test area concentration by the interior suit concentration. A colorimetric ammonia indicator strip of bromophenol blue or equivalent is placed on the inside of the suit face piece lens so that the suited individual is able to detect a color change and know if the suit has a significant leak. If a color change is observed the individual shall leave the test room immediately.

4.0—Required supplies

4.1 A supply of concentrated aqueous ammonium hydroxide (58% by weight).

4.2 A supply of bromophenol/blue indicating paper or equivalent, sensitive to 5–10 ppm ammonia or greater over a two-minute period of exposure. [pH 3.0 (yellow) to pH 4.6 (blue)]

4.3 A supply of high range (0.5–10 volume percent) and low range (5–700 ppm) detector tubes for ammonia and the corresponding sampling pump. More sensitive ammonia detectors can be substituted for the low range detector tubes to improve the sensitivity of this practice.

4.4 A shallow plastic pan (PVC) at least 12″:14″:1″ and a half pint plastic container (PVC) with tightly closing lid.

4.5 A graduated cylinder or other volumetric measuring device of at least 50 milliliters in volume with an accuracy of at least ±1 milliliters.

5.0—Safety precautions

5.1 Concentrated aqueous ammonium hydroxide, NH_4 OH, is a corrosive volatile liquid requiring eye, skin, and respiratory protection. The person conducting the test shall review the MSDS for aqueous ammonia.

5.2 Since the established permissible exposure limit for ammonia is 35 ppm as a 15 minute STEL, only persons wearing a positive pressure self-contained breathing apparatus or a positive pressure supplied air respirator shall be in the chamber. Normally only the person wearing the totally-encapsulating suit will be inside the chamber. A stand-by person shall have a positive pressure self-contained breathing apparatus, or a positive pressure supplied air respirator available to enter the test area should the suited individual need assistance.

5.3 A method to monitor the suited individual must be used during this test. Visual contact is the simplest but other methods using communication devices are acceptable.

5.4 The test room shall be large enough to allow the exercise protocol to be carried out and then to be ventilated to allow for easy exhaust of the ammonia test atmosphere after the test(s) are completed.

5.5 Individuals shall be medically screened for the use of respiratory protection and checked for allergies to ammonia before participating in this test procedure.

6.0—Test procedure

6.1.1 Measure the test area to the nearest foot and calculate its volume in cubic feet. Multiply the test area volume by 0.2 milliliters of concentrated aqueous ammonia solution per cubic foot of test area volume to determine the approximate volume of concentrated aqueous ammonia required to generate 1000 ppm in the test area.

6.1.2 Measure this volume from the supply of concentrated aqueous ammonia and place it into a closed plastic container.

6.1.3 Place the container, several high range ammonia detector tubes, and the pump in the clean test pan and locate it near the test area entry door so that the suited individual has easy access to these supplies.

6.2.1 In a non-contaminated atmosphere, open a pre-sealed ammonia indicator strip and fasten one end of the strip to the inside of the suit face shield lens where it can be seen by the wearer. Moisten the indicator strip with distilled water. Care shall be taken not to contaminate the detector part of the indicator paper by touching it. A small piece of masking tape or equivalent should be used to attach the indicator strip to the interior of the suit face shield.

6.2.2 If problems are encountered with this method of attachment, the indicator strip can be attached to the outside of the respirator face piece lens being used during the test.

6.3 Don the respiratory protective device normally used with the suit, and then don the TECP suit to be tested. Check to be sure all openings which are intended to be sealed (zippers, gloves, etc.) are completely sealed. DO NOT, however, plug off any venting valves.

6.4 Step into the enclosed test room such as a closet, bathroom, or test booth, equipped with an exhaust fan. No air should be exhausted from the chamber during the test because this will dilute the ammonia challenge concentrations.

6.5 Open the container with the pre-measured volume of concentrated aqueous ammonia within the enclosed test room, and pour the liquid into the empty plastic test pan. Wait two minutes to allow for adequate volatilization of the concentrated aqueous ammonia. A small mixing fan can be used near the evaporation pan to increase the evaporation rate of the ammonia solution.

6.6 After two minutes a determination of the ammonia concentration within the chamber should be made using the high range colorimetric detector tube. A concentration of 1000 ppm ammonia or greater shall be generated before the exercises are started.

6.7 To test the integrity of the suit the following four minute exercise protocol should be followed:

6.7.1 Raising the arms above the head with at least 15 raising motions completed in one minute.

6.7.2 Walking in place for one minute with at least 15 raising motions of each leg in a one-minute period.

6.7.3 Touching the toes with a least 10 complete motions of the arms from above the head to touching of the toes in a one-minute period.

6.7.4 Knee bends with at least 10 complete standing and squatting motions in a one-minute period.

6.8 If at any time during the test the colorimetric indicating paper should change colors, the test should be stopped and section 6.10 and 6.12 initiated (See ¶4.2).

6.9 After completion of the test exercise, the test area concentration should be measured again using the high range colorimetric detector tube.

6.10 Exit the test area.

6.11 The opening created by the suit zipper or other appropriate suit penetration should be used to determine the ammonia concentration in the suit with the low range length of stain detector tube or other ammonia monitor. The internal TECP suit air should be sampled far enough from the enclosed test area to prevent a false ammonia reading.

6.12 After completion of the measurement of the suit interior ammonia concentration the test is concluded and the suit is doffed and the respirator removed.

6.13 The ventilating fan for the test room should be turned on and allowed to run for enough time to remove the ammonia gas. The fan shall be vented to the outside of the building.

6.14 Any detectable ammonia in the suit interior (five ppm ammonia (NH_3) or more for the length of stain detector tube) indicates that the suit has failed the test. When other ammonia detectors are used a lower level of detection is possible, and it should be specified as the pass/fail criteria.

6.15 By following this test method, an intrusion coefficient of approximately 200 or more can be measured with the suit in a completely operational condition. If the intrusion coefficient is 200 or more, then the suit is suitable for emergency response and field use.

7.0—Retest procedures

7.1 If the suit fails this test, check for leaks by following the pressure test in test A above.

7.2 Retest the TECP suit as outlined in the test procedure 6.0.

8.0—Report

8.1 Each gas tight totally-encapsulating chemical protective suit tested by this practice shall have the following information recorded.

8.1.1 Unique identification number, identifying brand name, date of purchase, material of construction, and unique suit features; e.g., special breathing apparatus.

8.1.2 General description of test room used for test.

8.1.3 Brand name and purchase date of ammonia detector strips and color change data.

8.1.4 Brand name, sampling range, and expiration date of the length of stain ammonia detector tubes. The brand name and model of the sampling pump should also be recorded. If another type of ammonia detector is used, it should be identified along with its minimum detection limit for ammonia.

8.1.5 Actual test results shall list the two test area concentrations, their average, the interior suit concentration, and the calculated intrusion coefficient. Retest data shall be recorded as an additional test.

8.2 The evaluation of the data shall be specified as "suit passed" or "suit failed," and the date of the test. Any detectable ammonia (five ppm or greater for the length of stain detector tube) in the suit interior indicates the suit has failed this test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass fail criteria.

CAUTION

Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked.

Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

APPENDIX B TO §1910.120—GENERAL DESCRIPTION AND DISCUSSION OF THE LEVELS OF PROTECTION AND PROTECTIVE GEAR

This appendix sets forth information about personal protective equipment (PPE) protection levels which may be used to assist employers in complying with the PPE requirements of this section.

As required by the standard, PPE must be selected which will protect employees from the specific hazards which they are likely to encounter during their work on-site.

Selection of the appropriate PPE is a complex process which should take into consideration a variety of factors. Key factors involved in this process are identification of the hazards, or suspected hazards; their routes of potential hazard to employees (inhalation, skin absorption, ingestion, and eye or skin contact); and the performance of the PPE *materials* (and seams) in providing a barrier to these hazards. The amount of protection provided by PPE is material-hazard specific. That is, protective equipment materials will protect well against some hazardous substances and poorly, or not at all, against others. In many instances, protective equipment materials cannot be found which will provide continuous protection from the particular hazardous substance. In these cases the breakthrough time of the protective material should exceed the work durations.

Other factors in this selection process to be considered are matching the PPE to the employee's work requirements and task-specific conditions. The durability of PPE materials, such as tear strength and seam strength, should be considered in relation to the employee's tasks. The effects of PPE in relation to heat stress and task duration are a factor in selecting and using PPE. In some cases layers of PPE may be necessary to provide sufficient protection, or to protect expensive PPE inner garments, suits or equipment.

The more that is known about the hazards at the site, the easier the job of PPE selection becomes. As more information about the hazards and conditions at the site becomes available, the site supervisor can make decisions to up-grade or down-grade the level of PPE protection to match the tasks at hand.

The following are guidelines which an employer can use to begin the selection of the appropriate PPE. As noted above, the site information may suggest the use of combinations of PPE selected from the different protection levels (i.e., A, B, C, or D) as being more suitable to the hazards of the work. It should be cautioned that the listing below does not fully address the performance of the specific PPE material in relation to the specific hazards at the job site, and that PPE selection, evaluation and re-selection is an ongoing process until sufficient information about the hazards and PPE performance is obtained.

Part A. Personal protective equipment is divided into four categories based on the degree of protection afforded. (See Part B of this appendix for further explanation of Levels A, B, C, and D hazards.)

I. *Level A*— To be selected when the greatest level of skin, respiratory, and eye protection is required.

The following constitute Level A equipment; it may be used as appropriate;

1. Positive pressure, full face-piece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH).
2. Totally-encapsulating chemical-protective suit.
3. Coveralls.[1]
4. Long underwear.[1]
5. Gloves, outer, chemical-resistant.
6. Gloves, inner, chemical-resistant.
7. Boots, chemical-resistant, steel toe and shank.
8. Hard hat (under suit).[1]
9. Disposable protective suit, gloves and boots (depending on suit construction, may be worn over totally-encapsulating suit).

II. *Level B*—The highest level of respiratory protection is necessary but a lesser level of skin protection is needed.

The following constitute Level B equipment; it may be used as appropriate.

1. Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA (NIOSH approved).
2. Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls).
3. Coveralls.[1]

4. Gloves, outer, chemical-resistant.
5. Gloves, inner, chemical-resistant.
6. Boots, outer, chemical-resistant steel toe and shank.
7. Boot-covers, outer, chemical-resistant (disposable).[1]
8. Hard hat.[1]
9. [Reserved]
10. Face shield.[1]

III. *Level C*—The concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air purifying respirators are met.

The following constitute Level C equipment; it may be used as appropriate.

1. Full-face or half-mask, air purifying respirators (NIOSH approved).
2. Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls).
3. Coveralls.[1]
4. Gloves, outer, chemical-resistant.
5. Gloves, inner, chemical-resistant.
6. Boots (outer), chemical-resistant steel toe and shank.[1]
7. Boot-covers, outer, chemical-resistant (disposable)[1].
8. Hard hat.[1]
9. Escape mask.[1]
10. Face shield.[1]

IV. *Level D*—A work uniform affording minimal protection, used for nuisance contamination only.

The following constitute Level D equipment; it may be used as appropriate:

1. Coveralls.
2. Gloves.[1]
3. Boots/shoes, chemical-resistant steel toe and shank.
4. Boots, outer, chemical-resistant (disposable).[1]
5. Safety glasses or chemical splash goggles*.
6. Hard hat.[1]
7. Escape mask.[1]
8. Face shield.[1]

Part B. The types of hazards for which levels A, B, C, and D protection are appropriate are described below:

I. *Level A*—Level A protection should be used when:

1. The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the skin;
2. Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible; or
3. Operations are being conducted in confined, poorly ventilated areas, and the absence of conditions requiring Level A have not yet been determined.

II. *Level B*—Level B protection should be used when:

1. The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection;
2. The atmosphere contains less than 19.5 percent oxygen; or
3. The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the skin.

NOTE: This involves atmospheres with IDLH concentrations of specific substances that present severe inhalation hazards and that do not represent a severe skin hazard; or that do not meet the criteria for use of air-purifying respirators.

III. *Level C*—Level C protection should be used when:

1. The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin;
2. The types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove the contaminants; and
3. All criteria for the use of air-purifying respirators are met.

IV. *Level D*—Level D protection should be used when:

1. The atmosphere contains no known hazard; and
2. Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

NOTE: As stated before, combinations of personal protective equipment other than those described for Levels A, B, C, and D protection may be more appropriate and may be used to provide the proper level of protection.

As an aid in selecting suitable chemical protective clothing, it should be noted that the National Fire Protection Association (NFPA) has developed standards on chemical protective clothing. The standards that have been adopted by include:

NFPA 1991—Standard on Vapor-Protective Suits for Hazardous Chemical Emergencies (EPA Level A Protective Clothing).

NFPA 1992—Standard on Liquid Splash-Protective Suits for Hazardous Chemical Emergencies (EPA Level B Protective Clothing).

[1] Optional, as applicable.

NFPA 1993—Standard on Liquid Splash-Protective Suits for Non-emergency, Non-flammable Hazardous Chemical Situations (EPA Level B Protective Clothing).

These standards apply documentation and performance requirements to the manufacture of chemical protective suits. Chemical protective suits meeting these requirements are labelled as compliant with the appropriate standard. It is recommended that chemical protective suits that meet these standards be used.

APPENDIX C TO § 1910.120—COMPLIANCE GUIDELINES

1. *Occupational Safety and Health Program.* Each hazardous waste site clean-up effort will require an occupational safety and health program headed by the site coordinator or the employer's representative. The purpose of the program will be the protection of employees at the site and will be an extension of the employer's overall safety and health program. The program will need to be developed before work begins on the site and implemented as work proceeds as stated in paragraph (b). The program is to facilitate coordination and communication of safety and health issues among personnel responsible for the various activities which will take place at the site. It will provide the overall means for planning and implementing the needed safety and health training and job orientation of employees who will be working at the site. The program will provide the means for identifying and controlling worksite hazards and the means for monitoring program effectiveness. The program will need to cover the responsibilities and authority of the site coordinator or the employer's manager on the site for the safety and health of employees at the site, and the relationships with contractors or support services as to what each employer's safety and health responsibilities are for their employees on the site. Each contractor on the site needs to have its own safety and health program so structured that it will smoothly interface with the program of the site coordinator or principal contractor.

Also those employers involved with treating, storing or disposal of hazardous waste as covered in paragraph (p) must have implemented a safety and health program for their employees. This program is to include the hazard communication program required in paragraph (p)(1) and the training required in paragraphs (p)(7) and (p)(8) as parts of the employers comprehensive overall safety and health program. This program is to be in writing.

Each site or workplace safety and health program will need to include the following: (1) Policy statements of the line of authority and accountability for implementing the program, the objectives of the program and the role of the site safety and health supervisor or manager and staff; (2) means or methods for the development of procedures for identifying and controlling workplace hazards at the site; (3) means or methods for the development and communication to employees of the various plans, work rules, standard operating procedures and practices that pertain to individual employees and supervisors; (4) means for the training of supervisors and employees to develop the needed skills and knowledge to perform their work in a safe and healthful manner; (5) means to anticipate and prepare for emergency situations; and (6) means for obtaining information feedback to aid in evaluating the program and for improving the effectiveness of the program. The management and employees should be trying continually to improve the effectiveness of the program thereby enhancing the protection being afforded those working on the site.

Accidents on the site or workplace should be investigated to provide information on how such occurrences can be avoided in the future. When injuries or illnesses occur on the site or workplace, they will need to be investigated to determine what needs to be done to prevent this incident from occurring again. Such information will need to be used as feedback on the effectiveness of the program and the information turned into positive steps to prevent any reoccurrence. Receipt of employee suggestions or complaints relating to safety and health issues involved with site or workplace activities is also a feedback mechanism that can be used effectively to improve the program and may serve in part as an evaluative tool(s).

For the development and implementation of the program to be the most effective, professional safety and health personnel should be used. Certified Safety Professionals, Board Certified Industrial Hygienists or Registered Professional Safety Engineers are good examples of professional stature for safety and health managers who will administer the employer's program.

2. *Training.* The training programs for employees subject to the requirements of paragraph (e) of this standard should address: the safety and health hazards employees should expect to find on hazardous waste clean-up sites; what control measures or techniques are effective for those hazards; what monitoring procedures are effective in characterizing exposure levels; what makes an effective employer's safety and health program; what a site safety and health plan should include; hands on training with personal protective equipment and clothing they may be expected to use; the contents of the OSHA standard relevant to the employee's duties and function; and, employee's responsibilities under OSHA and other regulations. Supervisors will need training in their responsibilities under the safety and health program and its subject areas such as the spill

containment program, the personal protective equipment program, the medical surveillance program, the emergency response plan and other areas.

The training programs for employees subject to the requirements of paragraph (p) of this standard should address: the employers safety and health program elements impacting employees; the hazard communication program; the medical surveillance program; the hazards and the controls for such hazards that employees need to know for their job duties and functions. All require annual refresher training.

The training programs for employees covered by the requirements of paragraph (q) of this standard should address those competencies required for the various levels of response such as: the hazards associated with hazardous substances; hazard identification and awareness; notification of appropriate persons; the need for and use of personal protective equipment including respirators; the decontamination procedures to be used; preplanning activities for hazardous substance incidents including the emergency reponse plan; company standard operating procedures for hazardous substance emergency responses; the use of the incident command system and other subjects. Hands-on training should be stressed whenever possible. Critiques done after an incident which include an evaluation of what worked and what did not and how could the incident be better handled the next time may be counted as training time.

For hazardous materials specialists (usually members of hazardous materials teams), the training should address the care, use and/or testing of chemical protective clothing including totally encapsulating suits, the medical surveillance program, the standard operating procedures for the hazardous materials team including the use of plugging and patching equipment and other subject areas.

Officers and leaders who may be expected to be in charge at an incident should be fully knowledgeable of their company's incident command system. They should know where and how to obtain additional assistance and be familiar with the local district's emergency response plan and the state emergency response plan.

Specialist employees such as technical experts, medical experts or environmental experts that work with hazardous materials in their regular jobs, who may be sent to the incident scene by the shipper, manufacturer or governmental agency to advise and assist the person in charge of the incident should have training on an annual basis. Their training should include the care and use of personal protective equipment including respirators; knowledge of the incident command system and how they are to relate to it; and those areas needed to keep them current in their respective field as it relates to safety and health involving specific hazardous substances.

Those skilled support personnel, such as employees who work for public works departments or equipment operators who operate bulldozers, sand trucks, backhoes, etc., who may be called to the incident scene to provide emergency support assistance, should have at least a safety and health briefing before entering the area of potential or actual exposure. These skilled support personnel, who have not been a part of the emergency response plan and do not meet the training requirements, should be made aware of the hazards they face and should be provided all necessary protective clothing and equipment required for their tasks.

There are two National Fire Protection Association standards, NFPA 472—"Standard for Professional Competence of Responders to Hazardous Material Incidents" and NFPA 471—"Recommended Practice for Responding to Hazardous Material Incidents", which are excellent resource documents to aid fire departments and other emergency response organizations in developing their training program materials. NFPA 472 provides guidance on the skills and knowledge needed for first responder awareness level, first responder operations level, hazmat technicians, and hazmat specialist. It also offers guidance for the officer corp who will be in charge of hazardous substance incidents.

3. *Decontamination.* Decontamination procedures should be tailored to the specific hazards of the site, and may vary in complexity and number of steps, depending on the level of hazard and the employee's exposure to the hazard. Decontamination procedures and PPE decontamination methods will vary depending upon the specific substance, since one procedure or method may not work for all substances. Evaluation of decontamination methods and procedures should be performed, as necessary, to assure that employees are not exposed to hazards by re-using PPE. References in appendix D may be used for guidance in establishing an effective decontamination program. In addition, the U.S. Coast Guard's Manual, "Policy Guidance for Response to Hazardous Chemical Releases," U.S. Department of Transportation, Washington, DC (COMDTINST M16465.30) is a good reference for establishing an effective decontamination program.

4. *Emergency response plans.* States, along with designated districts within the states, will be developing or have developed local emergency response plans. These state and district plans should be utilized in the emergency response plans called for in the standard. Each employer should assure that its emergency response plan is compatible with the local plan. The major reference being used to aid in developing the state and local district plans is the *Hazardous Materials*

Emergency Planning Guide, NRT–1. The current Emergency Response Guidebook from the U.S. Department of Transportation, CMA's CHEMTREC and the Fire Service Emergency Management Handbook may also be used as resources.

Employers involved with treatment, storage, and disposal facilities for hazardous waste, which have the required contingency plan called for by their permit, would not need to duplicate the same planning elements. Those items of the emergency response plan that are properly addressed in the contingency plan may be substituted into the emergency response plan required in 1910.120 or otherwise kept together for employer and employee use.

5. *Personal protective equipment programs.* The purpose of personal protective clothing and equipment (PPE) is to shield or isolate individuals from the chemical, physical, and biologic hazards that may be encountered at a hazardous substance site.

As discussed in appendix B, no single combination of protective equipment and clothing is capable of protecting against all hazards. Thus PPE should be used in conjunction with other protective methods and its effectiveness evaluated periodically.

The use of PPE can itself create significant worker hazards, such as heat stress, physical and psychological stress, and impaired vision, mobility, and communication. For any given situation, equipment and clothing should be selected that provide an adequate level of protection. However, over-protection, as well as under-protection, can be hazardous and should be avoided where possible.

Two basic objectives of any PPE program should be to protect the wearer from safety and health hazards, and to prevent injury to the wearer from incorrect use and/or malfunction of the PPE. To accomplish these goals, a comprehensive PPE program should include hazard identification, medical monitoring, environmental surveillance, selection, use, maintenance, and decontamination of PPE and its associated training.

The written PPE program should include policy statements, procedures, and guidelines. Copies should be made available to all employees, and a reference copy should be made available at the worksite. Technical data on equipment, maintenance manuals, relevant regulations, and other essential information should also be collected and maintained.

6. *Incident command system (ICS).* Paragraph 1910.120(q)(3)(ii) requires the implementation of an ICS. The ICS is an organized approach to effectively control and *manage* operations at an emergency incident. The individual in charge of the ICS is the senior official responding to the incident. The ICS is not much different than the "command post" approach used for many years by the fire service. During large complex fires involving several companies and many pieces of apparatus, a command post would be established. This enabled *one* individual to be in charge of managing the incident, rather than having several officers from different companies making separate, and sometimes conflicting, decisions. The individual in charge of the command post would delegate responsibility for performing various tasks to subordinate officers. Additionally, all communications were routed through the command post to reduce the number of radio transmissions and eliminate confusion. However, strategy, tactics, and all decisions were made by one individual.

The ICS is a very similar system, except it is implemented for emergency response to all incidents, both large and small, that involve hazardous substances.

For a small incident, the individual in charge of the ICS may perform many tasks of the ICS. There may not be any, or little, delegation of tasks to subordinates. For example, in response to a small incident, the individual in charge of the ICS, in addition to normal command activities, may become the safety officer and may designate only one employee (with proper equipment) as a back-up to provide assistance if needed. OSHA does recommend, however, that at least two employees be designated as back-up personnel since the assistance needed may include rescue.

To illustrate the operation of the ICS, the following scenario might develop during a small incident, such as an overturned tank truck with a small leak of flammable liquid.

The first responding senior officer would implement and take command of the ICS. That person would size-up the incident and determine if additional personnel and apparatus were necessary; would determine what actions to take to control the leak; and, determine the proper level of personal protective equipment. If additional assistance is not needed, the individual in charge of the ICS would implement actions to stop and control the leak using the fewest number of personnel that can effectively accomplish the tasks. The individual in charge of the ICS then would designate himself as the safety officer and two other employees as a back-up in case rescue may become necessary. In this scenario, decontamination procedures would not be necessary.

A large complex incident may require many employees and difficult, time-consuming efforts to control. In these situations, the individual in charge of the ICS will want to delegate different tasks to subordinates in order to maintain a span of control that will keep the number of subordinates, that are reporting, to a manageable level.

Delegation of task at large incidents may be by location, where the incident scene is divided into sectors, and subordinate officers

coordinate activities within the sector that they have been assigned.

Delegation of tasks can also be by function. Some of the functions that the individual in charge of the ICS may want to delegate at a large incident are: medical services; evacuation; water supply; resources (equipment, apparatus); media relations; safety; and, site control (integrate activities with police for crowd and traffic control). Also for a large incident, the individual in charge of the ICS will designate several employees as back-up personnel; and a number of safety officers to monitor conditions and recommend safety precautions.

Therefore, no matter what size or complexity an incident may be, by implementing an ICS there will be *one individual in charge* who makes the decisions and gives directions; and, all actions, and communications are coordinated through one central point of command. Such a system should reduce confusion, improve safety, organize and coordinate actions, and should facilitate effective management of the incident.

7. *Site Safety and Control Plans.* The safety and security of response personnel and others in the area of an emergeny response incident site should be of primary concern to the incident commander. The use of a site safety and control plan could greatly assist those in charge of assuring the safety and health of employees on the site.

A comprehensive site safety and control plan should include the following: summary analysis of hazards on the site and a risk analysis of those hazards; site map or sketch; site work zones (clean zone, transition or decontamination zone, work or hot zone); use of the buddy system; site communications; command post or command center; standard operating procedures and safe work practices; medical assistance and triage area; hazard monitoring plan (air contaminate monitoring, etc.); decontamination procedures and area; and other relevant areas. This plan should be a part of the employer's emergency response plan or an extension of it to the specific site.

8. *Medical surveillance programs.* Workers handling hazardous substances may be exposed to toxic chemicals, safety hazards, biologic hazards, and radiation. Therefore, a medical surveillance program is essential to assess and monitor workers' health and fitness for employment in hazardous waste operations and during the course of work; to provide emergency and other treatment as needed; and to keep accurate records for future reference.

The *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* developed by the National Institute for Occupational Safety and Health (NIOSH), the Occupational Safety and Health Administration (OSHA), the U.S. Coast Guard (USCG), and the Environmental Protection Agency (EPA); October 1985 provides an excellent example of the types of medical testing that should be done as part of a medical surveillance program.

9. *New Technology and Spill Containment Programs.* Where hazardous substances may be released by spilling from a container that will expose employees to the hazards of the materials, the employer will need to implement a program to contain and control the spilled material. Diking and ditching, as well as use of absorbents like diatomaceous earth, are traditional techniques which have proven to be effective over the years. However, in recent years new products have come into the marketplace, the use of which complement and increase the effectiveness of these traditional methods. These new products also provide emergency responders and others with additional tools or agents to use to reduce the hazards of spilled materials.

These agents can be rapidly applied over a large area and can be uniformly applied or otherwise can be used to build a small dam, thus improving the workers' ability to control spilled material. These application techniques enhance the intimate contact between the agent and the spilled material allowing for the quickest effect by the agent or quickest control of the spilled material. Agents are available to solidify liquid spilled materials, to suppress vapor generation from spilled materials, and to do both. Some special agents, which when applied as recommended by the manufacturer, will react in a controlled manner with the spilled material to neutralize acids or caustics, or greatly reduce the level of hazard of the spilled material.

There are several modern methods and devices for use by emergency response personnel or others involved with spill control efforts to safely apply spill control agents to control spilled material hazards. These include portable pressurized applicators similar to hand-held portable fire extinguishing devices, and nozzle and hose systems similar to portable fire fighting foam systems which allow the operator to apply the agent without having to come into contact with the spilled material. The operator is able to apply the agent to the spilled material from a remote position.

The solidification of liquids provides for rapid containment and isolation of hazardous substance spills. By directing the agent at run-off points or at the edges of the spill, the reactant solid will automatically create a barrier to slow or stop the spread of the material. Clean-up of hazardous substances is greatly improved when solidifying agents, acid or caustic neutralizers, or activated carbon adsorbents are used. Properly applied, these agents can totally solidify liquid hazardous substances or neutralize or absorb them, which results in materials which are less hazardous and easier to handle,

transport, and dispose of. The concept of spill treatment, to create less hazardous substances, will improve the safety and level of protection of employees working at spill clean-up operations or emergency response operations to spills of hazardous substances.

The use of vapor suppression agents for volatile hazardous substances, such as flammable liquids and those substances which present an inhalation hazard, is important for protecting workers. The rapid and uniform distribution of the agent over the surface of the spilled material can provide quick vapor knockdown. There are temporary and long-term foam-type agents which are effective on vapors and dusts, and activated carbon adsorption agents which are effective for vapor control and soaking-up of the liquid. The proper use of hose lines or hand-held portable pressurized applicators provides good mobility and permits the worker to deliver the agent from a safe distance without having to step into the untreated spilled material. Some of these systems can be recharged in the field to provide coverage of larger spill areas than the design limits of a single charged applicator unit. Some of the more effective agents can solidify the liquid flammable hazardous substances and at the same time elevate the flashpoint above 140 °F so the resulting substance may be handled as a nonhazardous waste material if it meets the U.S. Environmental Protection Agency's 40 CFR part 261 requirements (See particularly § 261.21).

All workers performing hazardous substance spill control work are expected to wear the proper protective clothing and equipment for the materials present and to follow the employer's established standard operating procedures for spill control. All involved workers need to be trained in the established operating procedures; in the use and care of spill control equipment; and in the associated hazards and control of such hazards of spill containment work.

These new tools and agents are the things that employers will want to evaluate as part of their new technology program. The treatment of spills of hazardous substances or wastes at an emergency incident as part of the immediate spill containment and control efforts is sometimes acceptable to EPA and a permit exception is described in 40 CFR 264.1(g)(8) and 265.1(c)(11).

APPENDIX D TO § 1910.120—REFERENCES

The following references may be consulted for further information on the subject of this standard:

1. OSHA Instruction DFO CPL 2.70—January 29, 1986, *Special Emphasis Program: Hazardous Waste Sites.*

2. OSHA Instruction DFO CPL 2-2.37A—January 29, 1986, *Technical Assistance and Guidelines for Superfund and Other Hazardous Waste Site Activities.*

3. OSHA Instruction DTS CPL 2.74—January 29, 1986, *Hazardous Waste Activity Form, OSHA 175.*

4. *Hazardous Waste Inspections Reference Manual,* U.S. Department of Labor, Occupational Safety and Health Administration, 1986.

5. Memorandum of Understanding Among the National Institute for Occupational Safety and Health, the Occupational Safety and Health Administration, the United States Coast Guard, and the United States Environmental Protection Agency, *Guidance for Worker Protection During Hazardous Waste Site Investigations and Clean-up and Hazardous Substance Emergencies.* December 18, 1980.

6. *National Priorities List,* 1st Edition, October 1984; U.S. Environmental Protection Agency, Revised periodically.

7. *The Decontamination of Response Personnel,* Field Standard Operating Procedures (F.S.O.P.) 7; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, December 1984.

8. *Preparation of a Site Safety Plan,* Field Standard Operating Procedures (F.S.O.P.) 9; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, April 1985.

9. *Standard Operating Safety Guidelines;* U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, Environmental Response Team; November 1984.

10. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities,* National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), and Environmental Protection Agency (EPA); October 1985.

11. *Protecting Health and Safety at Hazardous Waste Sites: An Overview,* U.S. Environmental Protection Agency, EPA/625/9-85/006; September 1985.

12. *Hazardous Waste Sites and Hazardous Substance Emergencies,* NIOSH Worker Bulletin, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; December 1982.

13. *Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide;* U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; October 1984.

14. *Fire Service Emergency Management Handbook,* International Association of Fire Chiefs Foundation, 101 East Holly Avenue, Unit 10B, Sterling, VA 22170, January 1985.

15. *Emergency Response Guidebook,* U.S Department of Transportation, Washington, DC, 1987.

16. *Report to the Congress on Hazardous Materials Training, Planning and Preparedness,* Federal Emergency Management Agency, Washington, DC, July 1986.

17. *Workbook for Fire Command,* Alan V. Brunacini and J. David Beageron, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, 1985.

18. *Fire Command,* Alan V. Brunacini, National Fire Protection Association, Batterymarch Park,, Quincy, MA 02269, 1985.

19. *Incident Command System,* Fire Protection Publications, Oklahoma State University, Stillwater, OK 74078, 1983.

20. *Site Emergency Response Planning,* Chemical Manufacturers Association, Washington, DC 20037, 1986.

21. *Hazardous Materials Emergency Planning Guide,* NRT–1, Environmental Protection Agency, Washington, DC, March 1987.

22. *Community Teamwork: Working Together to Promote Hazardous Materials Transportation Safety.* U.S. Department of Transportation, Washington, DC, May 1983.

23. *Disaster Planning Guide for Business and Industry,* Federal Emergency Management Agency, Publication No. FEMA 141, August 1987.

(The Office of Management and Budget has approved the information collection requirements in this section under control number 1218–0139)

APPENDIX E TO § 1910.120—TRAINING CURRICULUM GUIDELINES

The following non-mandatory general criteria may be used for assistance in developing site-specific training curriculum used to meet the training requirements of 29 CFR 1910.120(e); 29 CFR 1910.120(p)(7), (p)(8)(iii); and 29 CFR 1910.120(q)(6), (q)(7), and (q)(8). These are generic guidelines and they are not presented as a complete training curriculum for any specific employer. Site-specific training programs must be developed on the basis of a needs assessment of the hazardous waste site, RCRA/TSDF, or emergency response operation in accordance with 29 CFR 1910.120.

It is noted that the legal requirements are set forth in the regulatory text of §1910.120. The guidance set forth here presents a highly effective program that in the areas covered would meet or exceed the regulatory requirements. In addition, other approaches could meet the regulatory requirements.

Suggested General Criteria

Definitions:

"Competent" means possessing the skills, knowledge, experience, and judgment to perform assigned tasks or activities satisfactorily as determined by the employer.

"Demonstration" means the showing by actual use of equipment or procedures.

"Hands-on training" means training in a simulated work environment that permits each student to have experience performing tasks, making decisions, or using equipment appropriate to the job assignment for which the training is being conducted.

"Initial training" means training required prior to beginning work.

"Lecture" means an interactive discourse with a class lead by an instructor.

"Proficient" means meeting a stated level of achievement.

"Site-specific" means individual training directed to the operations of a specific job site.

"Training hours" means the number of hours devoted to lecture, learning activities, small group work sessions, demonstration, evaluations, or hands-on experience.

Suggested core criteria:

1. *Training facility.* The training facility should have available sufficient resources, equipment, and site locations to perform didactic and hands-on training when appropriate. Training facilities should have sufficient organization, support staff, and services to conduct training in each of the courses offered.

2. *Training Director.* Each training program should be under the direction of a training director who is responsible for the program. The Training Director should have a minimum of two years of employee education experience.

3. *Instructors.* Instructors should be deem competent on the basis of previous documented experience in their area of instruction, successful completion of a "train-the-trainer" program specific to the topics they will teach, and an evaluation of instructional competence by the Training Director.

Instructors should be required to maintain professional competency by participating in continuing education or professional development programs or by completing successfully an annual refresher course and having an annual review by the Training Director.

The annual review by the Training Director should include observation of an instructor's delivery, a review of those observations with the trainer, and an analysis of any instructor or class evaluations completed by the students during the previous year.

4. *Course materials.* The Training Director should approve all course materials to be used by the training provider. Course materials should be reviewed and updated at least annually. Materials and equipment should be in good working order and maintained properly.

All written and audio-visual materials in training curricula should be peer reviewed by technically competent outside reviewers or by a standing advisory committee.

Reviews should possess expertise in the following disciplines were applicable: occupational health, industrial hygiene and safety, chemical/environmental engineering, employee education, or emergency response. One or more of the peer reviewers should be a employee experienced in the work activities to which the training is directed.

5. *Students.* The program for accepting students should include:

a. Assurance that the student is or will be involved in work where chemical exposures are likely and that the student possesses the skills necessary to perform the work.

b. A policy on the necessary medical clearance.

6. *Ratios.* Student-instructor ratios should not exceed 30 students per instructor. Hands-on activity requiring the use of personal protective equipment should have the following student-instructor ratios. For Level C or Level D personal protective equipment the ratio should be 10 students per instructor. For Level A or Level B personal protective equipment the ratio should be 5 students per instructor.

7. *Proficiency assessment.* Proficiency should be evaluated and documented by the use of a written assessment and a skill demonstration selected and developed by the Training Director and training staff. The assessment and demonstration should evaluate the knowledge and individual skills developed in the course of training. The level of minimum achievement necessary for proficiency shall be specified in writing by the Training Director.

If a written test is used, there should be a minimum of 50 questions. If a written test is used in combination with a skills demonstration, a minimum of 25 questions should be used. If a skills demonstration is used, the tasks chosen and the means to rate successful completion should be fully documented by the Training Director.

The content of the written test or of the skill demonstration shall be relevant to the objectives of the course. The written test and skill demonstration should be updated as necessary to reflect changes in the curriculum and any update should be approved by the Training Director.

The proficiency assessment methods, regardless of the approach or combination of approaches used, should be justified, documented and approved by the Training Director.

The proficiency of those taking the additional courses for supervisors should be evaluated and documented by using proficiency assessment methods acceptable to the Training Director. These proficiency assessment methods must reflect the additional responsibilities borne by supervisory personnel in hazardous waste operations or emergency response.

8. *Course certificate.* Written documentation should be provided to each student who satisfactorily completes the training course. The documentation should include:

a. Student's name.

b. Course title.

c. Course date.

d. Statement that the student has successfully completed the course.

e. Name and address of the training provider.

f. An individual identification number for the certificate.

g. List of the levels of personal protective equipment used by the student to complete the course.

This documentation may include a certificate and an appropriate wallet-sized laminated card with a photograph of the student and the above information. When such course certificate cards are used, the individual identification number for the training certificate should be shown on the card.

9. *Recordkeeping.* Training providers should maintain records listing the dates courses were presented, the names of the individual course attenders, the names of those students successfully completing each course, and the number of training certificates issued to each successful student. These records should be maintained for a minimum of five years after the date an individual participated in a training program offered by the training provider. These records should be available and provided upon the student's request or as mandated by law.

10. *Program quality control.* The Training Director should conduct or direct an annual written audit of the training program. Program modifications to address deficiencies, if any, should be documented, approved, and implemented by the training provider. The audit and the program modification documents should be maintained at the training facility.

Suggested Program Quality Control Criteria

Factors listed here are suggested criteria for determining the quality and appropriateness of employee health and safety training for hazardous waste operations and emergency response.

A. Training Plan.

Adequacy and appropriateness of the training program's curriculum development, instructor training, distribution of course materials, and direct student training should be considered, including

1. The duration of training, course content, and course schedules/agendas;

2. The different training requirements of the various target populations, as specified in the appropriate generic training curriculum;

3. The process for the development of curriculum, which includes appropriate technical input, outside review, evaluation, program pretesting.

4. The adequate and appropriate inclusion of hands-on, demonstration, and instruction methods;

5. Adequate monitoring of student safety, progress, and performance during the training.

B. Program management, Training Director, staff, and consultants.

Adequacy and appropriateness of staff performance and delivering an effective training program should be considered, including

1. Demonstration of the training director's leadership in assuring quality of health and safety training.

2. Demonstration of the competency of the staff to meet the demands of delivering high quality hazardous waste employee health and safety training.

3. Organization charts establishing clear lines of authority.

4. Clearly defined staff duties including the relationship of the training staff to the overall program.

5. Evidence that the training organizational structure suits the needs of the training program.

6. Appropriateness and adequacy of the training methods used by the instructors.

7. Sufficiency of the time committed by the training director and staff to the training program.

8. Adequacy of the ratio of training staff to students.

9. Availability and commitment of the training program of adequate human and equipment resources in the areas of

a. Health effects,

b. Safety,

c. Personal protective equipment (PPE),

d. Operational procedures,

e. Employee protection practices/procedures.

10. Appropriateness of management controls.

11. Adequacy of the organization and appropriate resources assigned to assure appropriate training.

12. In the case of multiple-site training programs, adequacy of satellite centers management.

C. Training facilities and resources.

Adequacy and appropriateness of the facilities and resources for supporting the training program should be considered, including,

1. Space and equipment to conduct the training.

2. Facilities for representative hands-on training.

3. In the case of multiple-site programs, equipment and facilities at the satellite centers.

4. Adequacy and appropriateness of the quality control and evaluations program to account for instructor performance.

5. Adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action.

6. Adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program.

7. Adequacy and appropriateness of the role of student evaluations to provide feedback for training program improvement.

D. Quality control and evaluation.

Adequacy and appropriateness of quality control and evaluation plans for training programs should be considered, including:

1. A balanced advisory committee and/or competent outside reviewers to give overall policy guidance;

2. Clear and adequate definition of the composition and active programmatic role of the advisory committee or outside reviewers.

3. Adequacy of the minutes or reports of the advisory committee or outside reviewers' meetings or written communication.

4. Adequacy and appropriateness of the quality control and evaluations program to account for instructor performance.

5. Adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action.

6. Adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program.

7. Adequacy and appropriateness of the role of student evaluations to provide feedback for training program improvement.

E. Students

Adequacy and appropriateness of the program for accepting students should be considered, including

1. Assurance that the student already possess the necessary skills for their job, including necessary documentation.

2. Appropriateness of methods the program uses to ensure that recruits are capable of satisfactorily completing training.

3. Review and compliance with any medical clearance policy.

F. Institutional Environment and Administrative Support

The adequacy and appropriateness of the institutional environment and administrative support system for the training program should be considered, including

1. Adequacy of the institutional commitment to the employee training program.

2. Adequacy and appropriateness of the administrative structure and administrative support.

G. Summary of Evaluation Questions

Key questions for evaluating the quality and appropriateness of an overall training program should include the following:

1. Are the program objectives clearly stated?
2. Is the program accomplishing its objectives?
3. Are appropriate facilities and staff available?
4. Is there an appropriate mix of classroom, demonstration, and hands-on training?
5. Is the program providing quality employee health and safety training that fully meets the intent of regulatory requirements?
6. What are the program's main strengths?
7. What are the program's main weaknesses?
8. What is recommended to improve the program?
9. Are instructors instructing according to their training outlines?
10. Is the evaluation tool current and appropriate for the program content?
11. Is the course material current and relevant to the target group?

Suggested Training Curriculum Guidelines

The following training curriculum guidelines are for those operations specifically identified in 29 CFR 1910.120 as requiring training. Issues such as qualifications of instructors, training certification, and similar criteria appropriate to all categories of operations addressed in 1910.120 have been covered in the preceding section and are not readdressed in each of the generic guidelines. Basic core requirements for training programs that are addressed include

1. General Hazardous Waste Operations
2. RCRA operations—Treatment, storage, and disposal facilities.
3. Emergency Response.

A. General Hazardous Waste Operations and Site-specific Training

1. *Off-site training.*Training course content for hazardous waste operations, required by 29 CFR 1910.120(e), should include the following topics or procedures:

a. *Regulatory knowledge.*

(1) An review of 29 CFR 1910.120 and the core elements of an occupational safety and health program.

(2) The content of a medical surveillance program as outlined in 29 CFR 1910.120(f).

(3) The content of an effective site safety and health plan consistent with the requirements of 29 CFR 1910.120(b)(4)(ii).

(4) Emergency response plan and procedures as outlined in 29 CFR 1910.38 and 29 CFR 1910.120(l).

(5) Adequate illumination.

(6) Sanitation recommendation and equipment.

(7) Review and explanation of OSHA's hazard-communication standard (29 CFR 1910.1200) and lock-out-tag-out standard (29 CFR 1910.147).

(8) Review of other applicable standards including but not limited to those in the construction standards (29 CFR Part 1926).

(9) Rights and responsibilities of employers and employees under applicable OSHA and EPA laws.

b. *Technical knowledge.*

(1) Type of potential exposures to chemical, biological, and radiological hazards; types of human responses to these hazards and recognition of those responses; principles of toxicology and information about acute and chronic hazards; health and safety considerations of new technology.

(2) Fundamentals of chemical hazards including but not limited to vapor pressure, boiling points, flash points, ph, other physical and chemical properties.

(3) Fire and explosion hazards of chemicals.

(4) General safety hazards such as but not limited to electrical hazards, powered equipment hazards, motor vehicle hazards, walking-working surface hazards, excavation hazards, and hazards associated with working in hot and cold temperature extremes.

(5) Review and knowledge of confined space entry procedures in 29 CFR 1910.146.

(6) Work practices to minimize employee risk from site hazards.

(7) Safe use of engineering controls, equipment, and any new relevant safety technology or safety procedures.

(8) Review and demonstration of competency with air sampling and monitoring equipment that may be used in a site monitoring program.

(9) Container sampling procedures and safeguarding; general drum and container handling procedures including special requirement for laboratory waste packs, shock-sensitive wastes, and radioactive wastes.

(10) The elements of a spill control program.

(11) Proper use and limitations of material handling equipment.

(12) Procedures for safe and healthful preparation of containers for shipping and transport.

(13) Methods of communication including those used while wearing respiratory protection.

c. Technical skills.

(1) Selection, use maintenance, and limitations of personal protective equipment including the components and procedures for carrying out a respirator program to comply with 29 CFR 1910.134.

(2) Instruction in decontamination programs including personnel, equipment, and hardware; hands-on training including level A, B, and C ensembles and appropriate decontamination lines; field activities including the donning and doffing of protective equipment to a level commensurate with the employee's anticipated job function and responsibility and to the degree required by potential hazards.

(3) Sources for additional hazard information; exercises using relevant manuals and hazard coding systems.

d. Additional suggested items.

(1) A laminated, dated card or certificate with photo, denoting limitations and level of protection for which the employee is trained should be issued to those students successfully completing a course.

(2) Attendance should be required at all training modules, with successful completion of exercises and a final written or oral examination with at least 50 questions.

(3) A minimum of one-third of the program should be devoted to hands-on exercises.

(4) A curriculum should be established for the 8-hour refresher training required by 29 CFR 1910.120(e)(8), with delivery of such courses directed toward those areas of previous training that need improvement or reemphasis.

(5) A curriculum should be established for the required 8-hour training for supervisors. Demonstrated competency in the skills and knowledge provided in a 40-hour course should be a prerequisite for supervisor training.

2. Refresher training.

The 8-hour annual refresher training required in 29 CFR 1910.120(e)(8) should be conducted by qualified training providers. Refresher training should include at a minimum the following topics and procedures:

(a) Review of and retraining on relevant topics covered in the 40-hour program, as appropriate, using reports by the students on their work experiences.

(b) Update on developments with respect to material covered in the 40-hour course.

(c) Review of changes to pertinent provisions of EPA or OSHA standards or laws.

(d) Introduction of additional subject areas as appropriate.

(e) Hands-on review of new or altered PPE or decontamination equipment or procedures. Review of new developments in personal protective equipment.

(f) Review of newly developed air and contaminant monitoring equipment.

3. On-site training.

a. The employer should provide employees engaged in hazardous waste site activities with information and training prior to initial assignment into their work area, as follows:

(1) The requirements of the hazard communication program including the location and availability of the written program, required lists of hazardous chemicals, and material safety data sheets.

(2) Activities and locations in their work area where hazardous substance may be present.

(3) Methods and observations that may be used to detect the present or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearances, or other evidence (sight, sound or smell) of hazardous chemicals being released, and applicable alarms from monitoring devices that record chemical releases.

(4) The physical and health hazards of substances known or potentially present in the work area.

(5) The measures employees can take to help protect themselves from work-site hazards, including specific procedures the employer has implemented.

(6) An explanation of the labeling system and material safety data sheets and how employees can obtain and use appropriate hazard information.

(7) The elements of the confined space program including special PPE, permits, monitoring requirements, communication procedures, emergency response, and applicable lock-out procedures.

b. The employer should provide hazardous waste employees information and training and should provide a review and access to the site safety and plan as follows:

(1) Names of personnel and alternate responsible for site safety and health.

(2) Safety and health hazards present on the site.

(3) Selection, use, maintenance, and limitations of personal protective equipment specific to the site.

(4) Work practices by which the employee can minimize risks from hazards.

(5) Safe use of engineering controls and equipment available on site.

(6) Safe decontamination procedures established to minimize employee contact with hazardous substances, including:

(A) Employee decontamination,

(B) Clothing decontamination, and

(C) Equipment decontamination.

(7) Elements of the site emergency response plan, including:

(A) Pre-emergency planning.

(B) Personnel roles and lines of authority and communication.

(C) Emergency recognition and prevention.

(D) Safe distances and places of refuge.

(E) Site security and control.

(F) Evacuation routes and procedures.

(G) Decontamination procedures not covered by the site safety and health plan.

(H) Emergency medical treatment and first aid.

(I) Emergency equipment and procedures for handling emergency incidents.

c. The employer should provide hazardous waste employees information and training on personal protective equipment used at the site, such as the following:

(1) PPE to be used based upon known or anticipated site hazards.

(2) PPE limitations of materials and construction; limitations during temperature extremes, heat stress, and other appropriate

medical considerations; use and limitations of respirator equipment as well as documentation procedures as outlined in 29 CFR 1910.134.

(3) PPE inspection procedures prior to, during, and after use.

(4) PPE donning and doffing procedures.

(5) PPE decontamination and disposal procedures.

(6) PPE maintenance and storage.

(7) Task duration as related to PPE limitations.

d. The employer should instruct the employee about the site medical surveillance program relative to the particular site, including

(1) Specific medical surveillance programs that have been adapted for the site.

(2) Specific signs and symptoms related to exposure to hazardous materials on the site.

(3) The frequency and extent of periodic medical examinations that will be used on the site.

(4) Maintenance and availability of records.

(5) Personnel to be contacted and procedures to be followed when signs and symptoms of exposures are recognized.

e. The employees will review and discuss the site safety plan as part of the training program. The location of the site safety plan and all written programs should be discussed with employees including a discussion of the mechanisms for access, review, and references described.

B. RCRA Operations Training for Treatment, Storage and Disposal Facilities.

1. As a minimum, the training course required in 29 CFR 1910.120 (p) should include the following topics:

(a) Review of the applicable paragraphs of 29 CFR 1910.120 and the elements of the employer's occupational safety and health plan.

(b) Review of relevant hazards such as, but not limited to, chemical, biological, and radiological exposures; fire and explosion hazards; thermal extremes; and physical hazards.

(c) General safety hazards including those associated with electrical hazards, powered equipment hazards, lock-out-tag-out procedures, motor vehicle hazards and walking-working surface hazards.

(d) Confined-space hazards and procedures.

(e) Work practices to minimize employee risk from workplace hazards.

(f) Emergency response plan and procedures including first aid meeting the requirements of paragraph (p)(8).

(g) A review of procedures to minimize exposure to hazardous waste and various type of waste streams, including the materials handling program and spill containment program.

(h) A review of hazard communication programs meeting the requirements of 29 CFR 1910.1200.

(i) A review of medical surveillance programs meeting the requirements of 29 CFR 1910.120(p)(3) including the recognition of signs and symptoms of overexposure to hazardous substance including known synergistic interactions.

(j) A review of decontamination programs and procedures meeting the requirements of 29 CFR 1910.120(p)(4).

(k) A review of an employer's requirements to implement a training program and its elements.

(l) A review of the criteria and programs for proper selection and use of personal protective equipment, including respirators.

(m) A review of the applicable appendices to 29 CFR 1910.120.

(n) Principles of toxicology and biological monitoring as they pertain to occupational health.

(o) Rights and responsibilities of employees and employers under applicable OSHA and EPA laws.

(p) Hands-on exercises and demonstrations of competency with equipment to illustrate the basic equipment principles that may be used during the performance of work duties, including the donning and doffing of PPE.

(q) Sources of reference, efficient use of relevant manuals, and knowledge of hazard coding systems to include information contained in hazardous waste manifests.

(r) At least 8 hours of hands-on training.

(s) Training in the job skills required for an employee's job function and responsibility before they are permitted to participate in or supervise field activities.

2. The individual employer should provide hazardous waste employees with information and training prior to an employee's initial assignment into a work area. The training and information should cover the following topics:

(a) The Emergency response plan and procedures including first aid.

(b) A review of the employer's hazardous waste handling procedures including the materials handling program and elements of the spill containment program, location of spill response kits or equipment, and the names of those trained to respond to releases.

(c) The hazardous communication program meeting the requirements of 29 CFR 1910.1200.

(d) A review of the employer's medical surveillance program including the recognition of signs and symptoms of exposure to relevant hazardous substance including known synergistic interactions.

(e) A review of the employer's decontamination program and procedures.

(f) An review of the employer's training program and the parties responsible for that program.

(g) A review of the employer's personal protective equipment program including the

proper selection and use of PPE based upon specific site hazards.

(h) All relevant site-specific procedures addressing potential safety and health hazards. This may include, as appropriate, biological and radiological exposures, fire and explosion hazards, thermal hazards, and physical hazards such as electrical hazards, powered equipment hazards, lock-out-tag-out hazards, motor vehicle hazards, and walking-working surface hazards.

(i) Safe use engineering controls and equipment on site.

(j) Names of personnel and alternates responsible for safety and health.

C. Emergency response training.

Federal OSHA standards in 29 CFR 1910.120(q) are directed toward private sector emergency responders. Therefore, the guidelines provided in this portion of the appendix are directed toward that employee population. However, they also impact indirectly through State OSHA or USEPA regulations some public sector emergency responders. Therefore, the guidelines provided in this portion of the appendix may be applied to both employee populations.

States with OSHA state plans must cover their employees with regulations at least as effective as the Federal OSHA standards. Public employees in states without approved state OSHA programs covering hazardous waste operations and emergency response are covered by the U.S. EPA under 40 CFR 311, a regulation virtually identical to §1910.120.

Since this is a non-mandatory appendix and therefore not an enforceable standard, OSHA recommends that those employers, employees or volunteers in public sector emergency response organizations outside Federal OSHA jurisdiction consider the following criteria in developing their own training programs. A unified approach to training at the community level between emergency response organizations covered by Federal OSHA and those not covered directly by Federal OSHA can help ensure an effective community response to the release or potential release of hazardous substances in the community.

a. *General considerations.*

Emergency response organizations are required to consider the topics listed in §1910.120(q)(6). Emergency response organizations may use some or all of the following topics to supplement those mandatory topics when developing their response training programs. Many of the topics would require an interaction between the response provider and the individuals responsible for the site where the response would be expected.

(1) Hazard recognition, including:

(A) Nature of hazardous substances present,

(B) Practical applications of hazard recognition, including presentations on biology, chemistry, and physics.

(2) Principles of toxicology, biological monitoring, and risk assessment.

(3) Safe work practices and general site safety.

(4) Engineering controls and hazardous waste operations.

(5) Site safety plans and standard operating procedures.

(6) Decontamination procedures and practices.

(7) Emergency procedures, first aid, and self-rescue.

(8) Safe use of field equipment.

(9) Storage, handling, use and transportation of hazardous substances.

(10) Use, care, and limitations of personal protective equipment.

(11) Safe sampling techniques.

(12) Rights and responsibilities of employees under OSHA and other related laws concerning right-to-know, safety and health, compensations and liability.

(13) Medical monitoring requirements.

(14) Community relations.

b. *Suggested criteria for specific courses.*

(1) *First responder awareness level.*

(A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1910.120(q).

(B) Hands-on experience with the U.S. Department of Transportation's Emergency Response Guidebook (ERG) and familiarization with OSHA standard 29 CFR 1910.1201.

(C) Review of the principles and practices for analyzing an incident to determine both the hazardous substances present and the basic hazard and response information for each hazardous substance present.

(D) Review of procedures for implementing actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including emergency notification procedures and follow-up communications.

(E) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(F) Awareness and knowledge of the competencies for the First Responder at the Awareness Level covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents.*

(2) *First responder operations level.*

(A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1910.120(q).

(B) Hands-on experience with the U.S. Department of Transportation's Emergency Response Guidebook (ERG), manufacturer material safety data sheets, CHEMTREC/

CANUTEC, shipper or manufacturer contacts, and other relevant sources of information addressing hazardous substance releases. Familiarization with OSHA standard 29 CFR 1910.1201.

(C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, the likely behavior of the hazardous substance and its container, the types of hazardous substance transportation containers and vehicles, the types and selection of the appropriate defensive strategy for containing the release.

(D) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including extended emergency notification procedures and follow-up communications.

(E) Review of the principles and practice for proper selection and use of personal protective equipment.

(F) Review of the principles and practice of personnel and equipment decontamination.

(G) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(H) Awareness and knowledge of the competencies for the First Responder at the Operations Level covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents.*

(3) *Hazardous materials technician.*

(A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1910.120(q).

(B) Hands-on experience with written and electronic information relative to response decision making including but not limited to the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, computer data bases and response models, and other relevant sources of information addressing hazardous substance releases. Familiarization with OSHA standard 29 CFR 1910.1201.

(C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, their physical and chemical properties, the likely behavior of the hazardous substance and its container, the types of hazardous substance transportation containers and vehicles involved in the release, the appropriate strategy for approaching release sites and containing the release.

(D) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including extended emergency notification procedures and follow-up communications.

(E) Review of the principles and practice for proper selection and use of personal protective equipment.

(F) Review of the principles and practices of establishing exposure zones, proper decontamination and medical surveillance stations and procedures.

(G) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(H) Awareness and knowledge of the competencies for the Hazardous Materials Technician covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents.*

(4) *Hazardous materials specialist.*

(A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1910.120(q).

(B) Hands-on experience with retrieval and use of written and electronic information relative to response decision making including but not limited to the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, computer data bases and response models, and other relevant sources of information addressing hazardous substance releases. Familiarization with OSHA standard 29 CFR 1910.1201.

(C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, their physical and chemical properties, and the likely behavior of the hazardous substance and its container, vessel, or vehicle.

(D) Review of the principles and practices for identification of the types of hazardous substance transportation containers, vessels and vehicles involved in the release; selecting and using the various types of equipment available for plugging or patching transportation containers, vessels or vehicles; organizing and directing the use of multiple teams of hazardous material technicians and selecting the appropriate strategy for approaching release sites and containing or stopping the release.

(E) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, including knowledge of the available public and private response resources, establishment of an incident command post, direction of hazardous material technician teams, and extended emergency notification procedures and follow-up communications.

(F) Review of the principles and practice for proper selection and use of personal protective equipment.

(G) Review of the principles and practices of establishing exposure zones and proper decontamination, monitoring and medical surveillance stations and procedures.

(H) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

(I) Awareness and knowledge of the competencies for the Off-site Specialist Employee covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents.*

(5) *Incident commander.*

The incident commander is the individual who, at any one time, is responsible for and in control of the response effort. This individual is the person responsible for the direction and coordination of the response effort. An incident commander's position should be occupied by the most senior, appropriately trained individual present at the response site. Yet, as necessary and appropriate by the level of response provided, the position may be occupied by many individuals during a particular response as the need for greater authority, responsibility, or training increases. It is possible for the first responder at the awareness level to assume the duties of incident commander until a more senior and appropriately trained individual arrives at the response site.

Therefore, any emergency responder expected to perform as an incident commander should be trained to fulfill the obligations of the position at the level of response they will be providing including the following:

(A) Ability to analyze a hazardous substance incident to determine the magnitude of the response problem.

(B) Ability to plan and implement an appropriate response plan within the capabilities of available personnel and equipment.

(C) Ability to implement a response to favorably change the outcome of the incident in a manner consistent with the local emergency response plan and the organization's standard operating procedures.

(D) Ability to evaluate the progress of the emergency response to ensure that the response objectives are being met safely, effectively, and efficiently.

(E) Ability to adjust the response plan to the conditions of the response and to notify higher levels of response when required by the changes to the response plan.

[54 FR 9317, Mar. 6, 1989, as amended at 55 FR 14073, Apr. 13, 1990; 56 FR 15832, Apr. 18, 1991; 59 FR 43270, Aug. 22, 1994; 61 FR 9238, Mar. 7, 1996; 67 FR 67964, Nov. 7, 2002]

§ 1910.121 [Reserved]

DIPPING AND COATING OPERATIONS

SOURCE: 64 FR 13909, Mar. 23, 1999, unless otherwise noted.

§ 1910.122 Table of contents.

This section lists the paragraph headings contained in §§ 1910.123 through 1910.126.

§ 1910.123 Dipping and coating operations: Coverage and definitions.

(a) Does this rule apply to me?
(b) What operations are covered?
(c) What operations are not covered?
(d) How are terms used in §§ 1910.123 through 1910.126 defined?

§ 1910.124 General requirements for dipping and coating operations.

(a) What construction requirements apply to dip tanks?
(b) What ventilation requirements apply to vapor areas?
(c) What requirements must I follow to recirculate exhaust air into the workplace?
(d) What must I do when I use an exhaust hood?
(e) What requirements must I follow when an employee enters a dip tank?
(f) What first-aid procedures must my employees know?
(g) What hygiene facilities must I provide?
(h) What treatment and first aid must I provide?
(i) What must I do before an employee cleans a dip tank?
(j) What must I do to inspect and maintain my dipping or coating operation?

§ 1910.125 Additional requirements for dipping and coating operations that use flammable or combustible liquids.

(a) What type of construction material must be used in making my dip tank?
(b) When must I provide overflow piping?
(c) When must I provide a bottom drain?
(d) When must my conveyer system shut down automatically?
(e) What ignition and fuel sources must be controlled?
(f) What fire protection must I provide?
(g) To what temperature may I heat a liquid in a dip tank?

§ 1910.126 Additional requirements for special dipping and coating operations.

(a) What additional requirements apply to hardening or tempering tanks?
(b) What additional requirements apply to flow coating?

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PART 311--WORKER PROTECTION

Sec.
311.1 Scope and application.
311.2 Definition of employee.
AUTHORITY: 29 U.S.C. 655, Pub. L. 99-499
SOURCE: 54 FR 26658, June 23, 1989, unless otherwise noted.

§ 311.1 Scope and application. The substantive provisions found at 29 CFR 1910.120 on and after March 6, 1990, and before March 6, 1990, found at 54 FR 9317 (March 6, 1989), State and local government employees engaged in *hazardous waste operations*, as defined in 29 CFR 1910.120(a), in States that do not have a State plan approved under section 18 of the Occupational Safety and Health Act of 1970.

§ 311.2 Definition of employee.
Employee in § 311.1 is defined as a compensated or non-compensated worker who is controlled directly by a State or local government, as contrasted to an independent contractor.

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APPENDIX C

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NFPA 472: A VEHICLE FOR DEVELOPING A COMPETENCY-BASED HAZ MAT/WMD EMERGENCY RESPONDER TRAINING PROGRAM

Gregory G. Noll, CSP, CHMM
Chairperson – NFPA 472

The threat of terrorism employing weapons of mass destruction (WMD), combined with the increasing use of hazardous materials (HM or haz mat) in criminal activities, has significantly altered the traditional philosophies of haz mat emergency response. Today, the classic distinctions between offensive and defensive tactics that have been the cornerstones of national haz mat operations standards since the 1980's are blurred by the development of newer tactical and operational procedures designed to meet these emerging threats and demands.

The objective of this article is to provide emergency response personnel with background information to assist them in assessing their current HM/WMD training program, and to provide an overview of those regulations and voluntary consensus standards that should be consulted to ensure that their personnel have the requisite skills and competencies to perform their expected tasks. Specific emphasis will be placed upon the recently revised National Fire Protection Association (NFPA) *Technical Standard 472 – Standard for Competence of Responders to Hazardous Materials / Weapons of Mass Destruction Incidents (2008 edition)*.

NFPA: A QUICK REVIEW

NFPA is a voluntary consensus standards writing organization. Although commonly associated with the fire service, NFPA develops and publishes voluntary consensus standards on a wide range of fire protection and safety topics. NFPA standards are developed through over 200 Technical Committees, each comprised of representatives from manufacturing, research and testing, regulatory enforcement, users and subject matter experts. NFPA standards are also developed in accordance with and accredited by the American National Standards Institute (ANSI).

Under NFPA policies, the membership of a Technical Committee must reflect the "community" of which the Standard impacts. Although commonly thought of as a fire service standard, NFPA 472 is actually an emergency responder standard and the Technical Committee reflects the multi-disciplinary nature of haz mat/WMD emergency response. Current NFPA 472 membership consists of 33 members from the following disciplines:

- Fire Service
- Law Enforcement
- Emergency Medical Services (EMS)

- Industry, including hazardous materials manufacturing and transportation
- Training and education community
- Research and testing laboratories
- Federal government agencies
- Subject matter experts.

NFPA 472 is NOT a procedures-based, "how to respond" technical standard. Rather, it addresses the minimum competencies required for those who may respond to haz mat/WMD incidents and are necessary for a risk-based response. Although NFPA 472 is NOT a Fire Service Professional Qualification Standard, it is adopted by reference by *NFPA 1001 – Standard for Firefighter Professional Qualifications*.

EMERGENCY RESPONDER HEALTH AND SAFETY: HM VS. WMD

During the past decade, HM/WMD training philosophies have evolved into two different schools of thought: (1) WMD is distinctly different than haz mat and should be viewed as a separate and distinct field; and (2) one cannot safely respond to WMD events if you don't first understand haz mat response and safety. It is the opinion and philosophy of the NFPA Technical Committee that an emergency responder cannot safely and effectively respond to an incident involving the criminal use of hazardous materials / WMD without first understanding the basic principles of haz mat emergency response that have been in existence for the last 30 years.

What are the differences between a haz mat and a WMD incident? From a health and safety viewpoint, very little. Haz mats can be any matter (solid, liquid, gas or energy) that when released into the environment can be harmful to people, property or the environment. Weapons of Mass Destruction, as defined by Title 18 US Code, describes the same materials and effects but in measurable quantities. The primary difference between these two lies in the events leading up to the release - whether it was an accidental release or done with criminal intent. In summary, while the events that lead each response discipline to a HM/WMD incident may vary, the actions that responders implement upon arrival are typically the same.

As emergency responders and agency administrators, many of us have been tasked with developing or improving our agency's HM/WMD response capabilities. The U.S. Occupational Safety and Health Administration (www.osha.gov) provides guidance to those entities, both public and private, that are responsible for hazardous material emergency and post-emergency response operations, through 29 CFR 1910.120 – *Hazardous Waste Operations and Emergency Response*. In addition, the U.S. Environmental Protection Agency (www.epa.gov) also provides comparable regulations through 40 CFR 311. It is important to recognize that while originally promulgated to improve haz mat safety, they are also applicable to incidents involving WMD threats and agents.

Both the OSHA 1910.120 and EPA 40 CFR Part 311 regulations provide specific requirements for the skills and competencies required for personnel who will respond or work at hazardous materials incidents. From a historical perspective, the OSHA 1910.120 requirements were originally derived from early drafts of NFPA 472 as the OSHA regulation was being developed in the late 1980's.

Regardless of response discipline, personnel skills and competencies to respond to HM/WMD incidents must meet the requirements of OSHA 1910.120(q). While OSHA 1910.120(q) tells you WHAT you must do, NFPA 472 provides the Authority Having Jurisdiction (AHJ) with specific guidance on the skills and competencies for personnel to perform their expected tasks as outlined by their organizational concept of operations.

NFPA 472: A TOOL TO TRAIN YOUR PERSONNEL

The NFPA 472 Committee has been in existence since 1986, with the first edition of NFPA 472 published in 1989. Although some non-fire responders view it as a "fire service only" standard, the scope of NFPA 472 specifies minimum competencies for those who will respond to HM/WMD incidents, regardless of their agency or response discipline. Since its initial release, NFPA 472 has gone through five revisions, with 2008 being the most recent. In contrast, OSHA 1910.120 has not been revised since its initial promulgation in 1989. Most would agree that the world is significantly different today than it was in 1989.

In developing the 2008 edition, the NFPA 472 Technical Committee decided to take a "holistic approach" during the revision process and re-examine the philosophy and framework upon which the Standard had been developed. In simple terms, "everything was on the table for discussion." As part of this process, the Technical Committee focused on (1) the blurred distinction between "traditional haz mat response" and its relationship to the growing HM/WMD terrorism response issues; and (2) a perception that the current standard does not address the needs of the emergency response community as a whole and is merely a "fire service" document. Ultimately, the 472 Technical Committee wanted the standard to focus on responders being trained to perform their expected tasks, regardless of their discipline.

As a result, NFPA 472 (2008) has been revised with several key operational philosophies in mind:

1. Emergency response operations to a terrorism or criminal scenario using hazardous materials are based upon the basic concepts of hazardous materials response. In simple terms, a responder cannot safely and effectively respond to a terrorism or criminal scenario involving hazardous materials/WMD if they don't first understand the basic principles and concepts of hazardous materials response.

2. The scope of NFPA 472 applies to ALL emergency responders, regardless of response discipline, who may respond to the emergency phase of a hazardous materials/WMD incident. In simple terms, if you are "called or tasked to respond" to a HM/WMD incident, you fall within the scope of the standard.
3. Provide a vehicle by which an AHJ can meet the training requirements of OSHA 1910.120(q). Emergency responders, regardless of their discipline and organizational affiliation, should be trained to perform their expected tasks. Given the real-world demands of limited time and resources, training should focus upon an individual's expected duties and tasks.

NFPA 472 KEY REVISIONS

Traditionally, any discussion on HM emergency responder training requirements has always focused upon which responder level does an individual fall into (i.e., Awareness, Operations, Technician, etc.), rather than addressing the follow-up OSHA 1910.120 (q)(6) requirement that "…training shall be based on the duties and function to be performed by each responder of an emergency response organization."

The net result is that responders have often received training in areas that clearly do not fall within their concept of operations or response capabilities. Examples include all First Responder – Operations personnel being trained to perform defensive product control measures and use self-contained breathing apparatus when some are not issued SCBA or expected to perform product control or technical decon tasks. A major goal of the NFPA 472 (2008) revision was to facilitate matching required skills and competencies with expected duties and tasks.

The following summarizes the NFPA 472 (2008) changes that will potentially have an impact upon HM/WMD emergency response operations:

Standard Scope and Purpose. The scope and purpose of NFPA 472 (2008) are based upon the following basic principles:

- Emergency responders, regardless of their discipline and organizational affiliation, should be trained to perform their expected tasks.
- Required competencies are necessary for the delivery of a risk-based response process at a HM/WMD incident. NOTE: Risk-Based Response process is defined as a systematic process by which responders analyze a problem involving HM/WMD, assess the hazards, evaluate the potential consequences, and determine appropriate response actions based upon the facts, science and circumstances of the incident.
- Personnel not directly involved in providing on-scene emergency response services (e.g., Hospital First-Receivers) are not covered under the scope of NFPA 472. Likewise, competencies for EMS personnel remain in *NFPA 473 (2008)* –

Standard for Competence of EMS Responders Responding to Hazardous Materials/Weapons of Mass Destruction Incidents.

HM vs. WMD vs. CBRNE. A variety of terms have been used to describe terrorism agents and the criminal use of hazardous materials. These include NBC, B-NICE, CBRN, and CBRNE. However, these terms do not have a regulatory basis and continue to change on a fairly regular basis.

The 472 Committee ultimately chose to define Hazardous Materials as "Matter (solid, liquid or gas) that when released is capable of creating harm to people, the environment and property. This includes Weapons of Mass Destruction (WMD), as defined in 18 US Code Section 2332A, as well as other criminal use of hazardous materials, such as drug labs, environmental crimes or industrial sabotage, etc." This incorporates both haz mat and WMD into a single definition, and allows for haz mat and WMD competencies to be combined into a single document.

Awareness-Level Personnel. There is a major departure in how Awareness-Level Responders have traditionally been viewed. A significant change is dropping the term "responder" from the Awareness Level, as these individuals are typically NOT emergency responders. Examples of Awareness level personnel would include plant security personnel, public works and facility maintenance personnel, and others who require OSHA Hazard Communications (OSHA 1910.1200) training.

Awareness-Level Personnel are now defined as "persons who, in the course of their normal duties, could be the first on the scene of an emergency involving a HM/WMD and who are expected to recognize the presence of HM/WMD, protect themselves, call for trained personnel and secure the area." In simple terms, they are the "first to discover" rather than the "first to respond."

Historically, some have viewed firefighters and EMS personnel as "Awareness Level" responders who would be able to recognize a hazardous material release from a safe distance and then activate the local emergency response plan. Today however, with the threat of terrorism and the growing trend of illicit drug labs, firefighters, law enforcement and EMS personnel are now expected to do far more than observe from a safe distance. In addition, a large number of law enforcement and EMS personnel are now being provided with personal protective clothing as a result of potential WMD threats. As a result, these responders – as per OSHA 1910.120(q) are now expected to perform tasks that go far beyond the traditional "Awareness level" tasks of recognize, notify and protect themselves.

Operations-Level Responder. The most substantial revisions to NFPA (2008) pertain to the Operations-level responder, and these reflect the changes in the haz mat response community created by the WMD and criminal use of haz mat threats. These revisions will also facilitate the adoption and use of NFPA 472 by non-fire service

disciplines. There are no significant changes for fire service personnel who were previously trained to NFPA (2002) Operations-Level requirements.

If an individual is tasked to respond to the scene of a HM/WMD incident during the emergency phase, they are now viewed as an Operations-level responder. In simple terms, if the local emergency response system is activated (e.g., 911 call) and an agency is tasked to respond to the scene to provide on-scene emergency services, they are viewed as an Operations-Level Responder. This would include fire, rescue, law enforcement, emergency medical services, private industry, and other allied professionals.

To better address the issue of matching requisite skills and competencies with expected duties at the operations-level, NFPA 472 (2008) breaks the Operations-level competencies into two categories:

- *Core Competencies* would be required of all emergency responders who are tasked to respond to a HM/WMD incident. However, these core competencies do not include any product control and personal protective clothing and equipment competencies, and decon is limited to the ability to perform emergency decon. While there are clearly some additional requirements pertaining to initial incident analysis, these new proposed core competencies are not significantly greater than the NFPA 472 (2002) Awareness competencies.

- *Mission-Specific Competencies* are optional and are provided so that the Authority Having Jurisdiction (AHJ) can match the expected tasks and duties of its personnel with the required competencies. Mission-specific competencies are NOT mandated and should be viewed as optional at the discretion of the AHJ based upon an assessment of local risks.

  Mission-Specific Competencies were developed by (1) combining NFPA 472 (2002) Hazardous Materials Technician competencies in a specific area (e.g., use of PPE, Product Control, Technical Decon, etc.), and (2) developing new competencies where needed (e.g., Victim Rescue and Recovery, Evidence Preservation). They allow emergency responders to perform mission-specific tasks without being fully trained to the Haz Mat Technician level.

  Mission-Specific Competencies include the following:
  - Use personal protective equipment, as provided by the AHJ
  - Perform technical decontamination
  - Perform mass decontamination
  - Perform product control
  - Perform air monitoring and sampling
  - Perform victim rescue and recovery operations
  - Evidence preservation and sampling

- Response to illicit laboratory incidents

This shift to Operations-Level Core and Mission-Specific Competencies more accurately describes the tasks currently being performed by all emergency response disciplines in light of current threats.

Some individuals have legitimately questioned the ability of Operations-Level Responders to perform traditional Hazardous Materials Technician tasks. To ensure the safety of personnel performing mission-specific competencies, NFPA 472 (2008) also requires that the optional mission-specific competencies be performed under the guidance of either a (1) Hazardous Materials Technician, (2) an allied professional (e.g., Certified Industrial Hygienist, subject matter expert, product specialist, etc., as determined by the AHJ), or (3) standard operating procedures.

While there are minimal changes for the fire service, this does represent a change for the Law Enforcement (LE) and Emergency Medical Services (EMS) community. Historically, many LE and EMS providers have viewed themselves as Awareness-Level Personnel. Under the revised NFPA 472 (2008), most LE patrol officers would be trained to the Operations core competencies, while LE specialized operations, including SWAT, EOD, Mobile Field Force and Forensic units with a higher probability of HM/WMD exposure, would be trained to those mission-specific competencies based upon their concept of operations and expected duties.

NFPA 1001 (2008) - Firefighter I. Historically, NFPA 1001 Firefighter I candidates were only required to be trained to the Awareness-Level. To resolve conflicts between NFPA 472 and NFPA 1001, and ensure consistency with OSHA interpretations that firefighters should be trained to the Operations Level, NFPA 1001 (2008) has also been revised so that a Firefighter I shall now be required to meet the NFPA 472 Core Competencies for Operations Level Responders, and the Mission Specific Competencies: Product Control.

There are minimal differences between fire service personnel who were previously trained to NFPA (2002) Operations-Level requirements and those who will be trained to the NFPA 472 (2008) Core Competencies for Operations Level Responders and the Mission Specific Competencies: Product Control. As a result, few changes should be required to those fire service training curriculums that previously certified firefighters to the NFPA 472 (2002) competencies for Operations- Level Responders.

EMS Personnel. Competencies for EMS personnel are published in *NFPA 473 – Standard for Competence for EMS Personnel Responding to Hazardous Materials / Weapons of Mass Destruction Incidents (2008 edition)*. NFPA 473 (2008) has been completely rewritten to address the hazards that EMS personnel encounter from HM/WMD.

Under NFPA 473 (2008), all EMS personnel operating at HM/WMD incidents shall be trained to meet the NFPA 472 (2008) Operations-Level Core Competencies. Remaining competencies are based upon whether the individual is a Basic Life Support (BLS) Responder (e.g., EMT-A/B, Emergency Care First Responder) or an Advanced Life Support (ALS) Responder (e.g., EMT-I, EMT-P, Medical Director, Medical Team Specialist).

Hazardous Materials Technician. There no significant changes to HM Technician competencies. However, the definition has been revised to better clarify their expected competencies. A Hazardous Materials Technician is a person who responds to HM/WMD incidents using a risk-based response process by which they:

- Analyze a problem involving HM/WMD;
- Select applicable decontamination procedures; and
- Control a release using specialized protective clothing and equipment.

Similarly, the definition of a Hazardous Materials Response Team (HMRT) has been modified to specifically reference that HMRT's perform Haz Mat Technician-level skills and must be staffed with personnel trained to the Hazardous Materials Technician level.

Given that Haz Mat Entry Units are a typed resource under the National Incident Management System (NIMS), the Technical Committee believes that this will ensure consistency in operational capabilities. In addition, the NIMS Resource Typing Standards reference NFPA 472 as the basis for Haz Mat Entry Unit training.

SUMMARY

The revisions to NFPA 472 (2008) are another step in the growth and maturation of the HM/WMD response community. Changes to the 2008 edition can be summarized as follows:

- The Technical Standard better reflects competencies for all responders to HM/WMD incidents and provides more flexibility in meeting discipline-specific mission requirements while maintaining a high standard.
- The Technical Standard integrates WMD issues and removes the need for two stand-alone documents.
- Awareness-Level Personnel are no longer viewed as emergency responders.
- Operations-Level Responders can be trained in mission-specific tasks without being fully trained to the Haz Mat Technician level.
- No major changes to other training levels

Rather than trying to fit emergency responders into a regulatory box, NFPA 472 (2008) provides emergency response agencies with a competency-based framework to ensure

that emergency responders are trained to perform their expected tasks and assigned duties. In addition, training programs designed to meet the requirements of NFPA 472 (2008) will far surpass the regulatory requirements of OSHA 1910.120 (q).

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APPENDIX D

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Introducing ...



National Response Framework

Homeland Security

January 2008

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NATIONAL RESPONSE FRAMEWORK

What Is the *National Response Framework*?

The ***National Response Framework*** presents the guiding principles that enable all response partners to prepare for and provide a unified national response to disasters and emergencies – from the smallest incident to the largest catastrophe.

This important document establishes a comprehensive, national, all-hazards approach to domestic incident response.

The ***Framework*** defines the key principles, roles, and structures that organize the way we respond as a Nation. It describes how communities, tribes, States, the Federal Government, and private-sector and nongovernmental partners apply these principles for a coordinated, effective national response. It also identifies special circumstances where the Federal Government exercises a larger role, including incidents where Federal interests are involved and catastrophic incidents where a State would require significant support. The ***Framework*** enables first responders, decisionmakers, and supporting entities to provide a unified national response.

How Did the *Framework* Evolve?

In recent years, our Nation has faced an unprecedented series of disasters and emergencies, and as a result our national response structures have evolved and improved to meet these threats. The ***National Response Framework*** reflects those improvements and replaces the former ***National Response Plan (NRP).***

This ***Framework*** represents a natural evolution of the national response architecture. Although the ***NRP*** was originally called a plan, it was actually a framework written to guide the integration of local, tribal, State, and Federal response efforts. By adopting the term "framework" within the title, this document is now more accurately aligned with its intended purpose.

Who Needs To Know About This *Framework*?

The ***Framework*** is written for senior elected and appointed leaders, such as Federal department or agency heads, Governors, mayors, tribal leaders, and city or county officials – those who have a responsibility to provide an effective response to preserve the safety and welfare of the community.

At the same time, the ***Framework*** informs emergency management practitioners, explaining the operating structures and systems used routinely by first responders and emergency managers at all levels of government.

The ***Framework*** document is augmented with online access to supporting documents, further training, and an evolving resource for exchanging lessons learned.

An effective, unified national response requires layered, mutually supporting capabilities.

The Framework systematically incorporates public-sector agencies at all levels, the private sector, and nongovernmental organizations (NGOs). It also emphasizes the importance of personal preparedness by individuals and households.



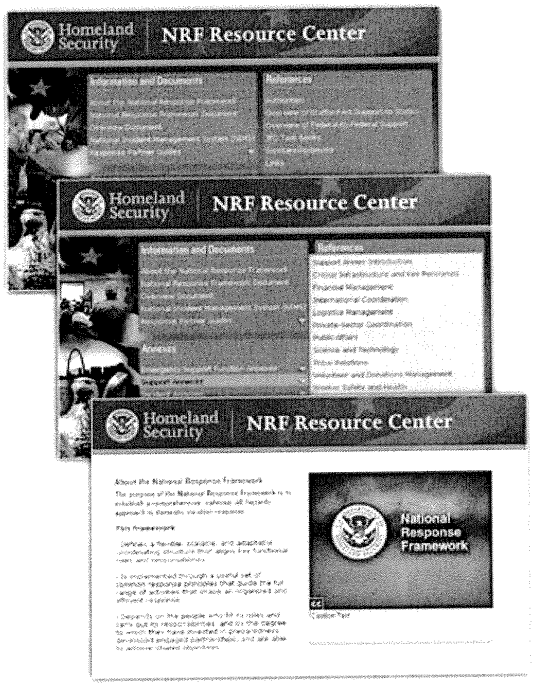
Sharing Resources and Best Practices

Looking for additional information?

The *National Response Framework (NRF)* Resource Center provides ready access to information and tools needed for all response partners to fulfill their roles under the *Framework*.

Key Documents

- *National Response Framework (NRF):* Delineates our Nation's response doctrine, responsibilities, and structures.
- *National Incident Management System (NIMS):* Establishes a systematic approach for managing incidents nationwide.
- *ESF, Support, and Incident Annexes:* Provide concept of operations, procedures, and structures for achieving response objectives.
- *National Strategy for Homeland Security:* Reflects the National Preparedness Guidelines, which include the National Planning Scenarios.
- *Response Partner Guides:* Provide a ready reference of key roles and actions for local, tribal, State, Federal, and private-sector response partners.



References

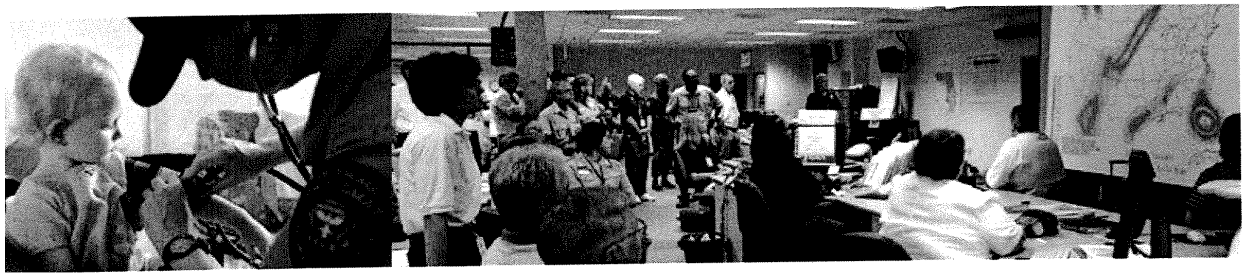
- Authorities and References
- Stafford Act Support Overview
- Federal-to-Federal Support Overview
- Task Books/Position Descriptions
- Standard Operating Procedures
- Glossary of Terms/Acronyms
- Additional Links

Learning Resources

- Job Aids
- Training Courses
- Online Videos

Comprehensive Information With Just One Click

http://www.fema.gov/NRF



A *Framework* for Sharpening National Response

The *National Response Framework* is a guide to how the Nation conducts all-hazards response.

Guided by the input and help of many hundreds of stakeholders, the *Framework* represents a natural evolution of the national response architecture. Specifically, the *Framework*:

- Reflects lessons learned and defines the core principles for managing incidents.
- Broadens the focus from a purely Federal plan to one that is truly national.
- Methodically describes the who, what, and how of emergency preparedness and response.
- Articulates the five key principles of response doctrine.

Response Doctrine: Key Principles

- **Engaged Partnership.** Leaders at all levels must communicate and actively support engaged partnerships by developing shared goals and aligning capabilities so that no one is overwhelmed in times of crisis.
- **Tiered Response.** Incidents must be managed at the lowest possible jurisdictional level and supported by additional capabilities when needed.
- **Scalable, Flexible, and Adaptable Operational Capabilities.** As incidents change in size, scope, and complexity, the response must adapt to meet requirements.
- **Unity of Effort Through Unified Command.** Effective unified command is indispensable to response activities and requires a clear understanding of the roles and responsibilities of each participating organization.
- **Readiness To Act.** Effective response requires readiness to act balanced with an understanding of risk. From individuals, households, and communities to local, tribal, State, and Federal governments, national response depends on the instinct and ability to act.

National Response Framework Components

The *Framework's* clear, simple writing style makes the serious work of incident management understandable for government and business executives as well as emergency management practitioners. The *Framework* is structured as follows:

Chapter I: Roles and Responsibilities — Sharpens the focus on **who** is involved with emergency management activities at the local, tribal, State, and Federal levels and with the private sector and NGOs.

Chapter II: Response Actions — Describes **what** we as a Nation collectively do to respond to incidents.

Chapter III: Response Organization — Explains **how** we as a Nation are organized to implement response actions.

Chapter IV: Planning — Emphasizes the importance of planning and summarizes the elements of national planning structures.

Chapter V: Additional Resources — Summarizes the content and plan for the online NRF Resource Center.



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APPENDIX E

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NATIONAL FIRE PROTECTION ASSOCIATION UPDATE

A. Origin and Development (O&D) lays out the scope and application of the document. Key points:

1. Applies to **all** personnel who respond to the emergency phase of hazardous materials/weapons of mass destruction (hazmat/WMD) incidents.

2. If you are a "player," you are covered by National Fire Protection Association (NFPA) 472.

3. If you are not involved directly in the delivery of on-scene emergency services, you are **not** covered by NFPA 472.

B. Awareness level.

1. Definition: Those persons who, in the course of their normal duties, could be the first on the scene of an emergency involving a hazmat/WMD and who are expected to:

a. Recognize the presence of hazmat/WMD.

b. Protect themselves.

c. Call for trained personnel.

d. Secure the area.

2. Comments.

a. Term "responder" has been dropped.

b. Individuals, in the course of their duties, may be first on scene.

c. Competencies are essentially comparable to Occupational Safety and Health Administration (OSHA) Hazard Communication requirements (OSHA 1910.120).

C. Operations level.

1. Definition: Those persons who respond to releases or potential releases of a hazmat/WMD as part of the response to the incident for the purpose of protecting nearby persons, the environment, or property from the effects of the release.

2. These persons may have additional competencies that are specific to their response mission, expected tasks, equipment and training as determined by the authority having jurisdiction (AHJ).

3. Comments.

   a. If you are tasked to respond to the scene of a hazmat/WMD incident (i.e., player versus support), you are an operations-level responder.

   b. Operations-level competencies are divided into:

      - Operations-level core competencies.

      - Mission-specific competencies.

      - Agent-specific competencies (annex information).

   c. Represents the **most** significant change to NFPA 472.

4. Core competencies.

   a. The knowledge, skills and judgment needed by all operations-level responders who may respond to releases or potential releases of a hazmat/WMD.

   b. Are 472-2002 competencies minus product control, personal protective equipment (PPE), and some decon competencies.

   c. Trained to use PPE provided by the AHJ.

   d. Capable of implementing emergency decon.

   e. All product control competencies are reclassified as mission-specific competencies.

5. Mission-specific competencies.

   a. The knowledge, skills and judgment needed by operations-level responders who have completed the requisite core competencies and who are designated by the AHJ to perform mission-specific tasks.

   b. Determined based on duties as assigned by the AHJ.

   c. Mission-specific competencies.

      - Use personal protective clothing.

      - Perform technical decontamination.

      - Perform mass decontamination.

- Perform product control measures.

- Perform air monitoring and sampling.

- Perform victim rescue and removal.

- Evidence preservation and sampling.

- Illicit laboratories incident response.

d. Competencies shall be performed under the guidance of either:

- Hazmat technician.

- Allied professional.

- Written standard operating procedures (SOPs) as determined by the AHJ.

e. Mission-specific competencies are packaged in a common chapter.

6. Allied professional.

Definition: That person who possesses the knowledge, skills and technical competence to provide assistance in the selection, implementation and evaluation of mission-specific tasks at a hazmat/WMD incident.

a. Certified Industrial Hygienist (CIH).

b. Certified Safety Professional (CSP).

c. Certified Health Physicist (CHP).

d. Other similar credentialed or competent individuals as determined by the AHJ.

7. EMS personnel (NFPA 473).

a. EMS personnel must meet NFPA 472 core competency requirements.

b. Mission-specific competencies.

- Basic life support (BLS) personnel.

- Advanced life support (ALS) personnel.

8. Agent-specific competencies.

The knowledge, skills and judgment needed by operations-level responders who have completed the requisite core competencies and who are designated by the AHJ to respond to releases or potential releases of a specific WMD agent (e.g., chemical, biological, explosive, radioactive).

a. These are determined based upon duties as assigned by the AHJ.

b. Annex information.

D. Hazmat technician.

1. Definition: Person who responds to releases or potential releases of a hazmat/ WMD and has the competence to:

a. Analyze a problem involving hazmat/WMD using a risk-based response process (see 6.1.2.2(1)).

b. Select the appropriate decon procedures.

c. Control a release using specialized protective clothing and control equipment.

2. These persons may have additional competencies specific to their response mission, expected tasks, equipment and training as determined by the AHJ.

3. Comments.

a. No major changes to hazmat technician, although some competencies have moved from hazmat technician to first responder operations.

b. "A technician is a technician" regardless of discipline affiliation.

- Hazmat technicians are now a Department of Homeland Security (DHS)-typed resource.

- DHS resource typing training requirements directly reference NFPA 472.

E. Hazmat response team.

1. Definition.

a. Organized group of trained response personnel operating under an emergency response plan and appropriate SOPs who perform technician-level skills at hazmat/WMD incidents.

b. **Justification:** Changed to better reflect the point that hazmat technicians are tasked to perform technician-level skills and competencies.

2. Risk-based response.

   A systematic process by which responders analyze a problem involving hazmat/ WMD, assess the hazards, evaluate the **risks**, and determine appropriate response actions based upon facts, science and the circumstances of the incident.

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UNIT 2: INCIDENT COMMAND SYSTEM

TERMINAL OBJECTIVE

The students will be able to demonstrate knowledge of Incident Command System (ICS)/Emergency Operations Center (EOC) organization and operations at hazardous materials/weapons of mass destruction (hazmat/WMD) to include the process of transfer of Command and the development/implementation of an effective Incident Action Plan (IAP).

ENABLING OBJECTIVES

The students will:

1. *Demonstrate the following:*
    a. *Roles and responsibilities of Command and General Staff.*
    b. *Single versus Unified Command.*
    c. *ICS structure (Divisions/Groups/Branches).*
    d. *First-arriving Incident Commander (IC).*
    e. *Transfer of Command.*
    f. *Safety Officer required.*
    g. *Resources — Go/No Go.*
2. *Demonstrate competency/use of appropriate ICS forms needed to compile a safe and effective IAP that addresses the seven incident objectives/goals of hazmat/WMD incidents.*
3. *Explain the organization and interaction of both an Incident Command Post (ICP) and an EOC for hazmat/WMD incidents, and identify the following:*
    a. *Role of the ICP.*
    b. *Role of the EOC, to include how it's activated.*
    c. *Interaction of ICP with the EOC.*

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NATIONAL RESPONSE PLAN

In Homeland Security Presidential Directive-5 (HSPD-5), the president directed the development of a new National Response Plan (NRP) to align federal coordination structures, capabilities and resources into a unified, all-discipline and all-hazards approach to domestic incident management. This approach is unique and far reaching in that it, for the first time, eliminates critical seams and ties together a complete spectrum of incident management activities to include the prevention of, preparedness for, response to, and recovery from terrorism, major natural disasters, and other major emergencies. The end result is vastly improved coordination among federal, state, local and tribal governments to help save lives and protect America's communities by increasing the speed, effectiveness and efficiency of incident management.

The NRP represents a true "national" framework in terms of both product and process. The NRP development process included coordination with federal, state, local and tribal governments, nongovernmental organizations, private-sector entities, and the first-responder and emergency management communities across the country. The NRP incorporates best practices from a wide variety of incident management disciplines to include fire, rescue, emergency management, law enforcement, public works, and Emergency Medical Services (EMS). The collective input we received from our public- and private-sector partners has been, and will continue to be, absolutely critical to the implementation and continued refinement of the core concepts included in this ground-breaking national plan.

The NRP is built on the template of the National Incident Management System (NIMS), which provides a consistent doctrinal framework for incident management at all jurisdictional levels, regardless of the cause, size or complexity of the incident. The activation of the NRP and its coordinating structures and protocols — either partially or fully — for specific incidents of national significance provides mechanisms for the coordination and implementation of a wide variety of incident management and emergency assistance activities. Included in these activities are federal support to state, local and tribal authorities; interaction with nongovernmental, private donor, and private-sector organizations; and the coordinated, direct exercise of federal authorities, when appropriate.

The NRP is also an essential element of the broader policy coordination and reconciliation mechanisms of the federal government. The operational and resource coordinating structures described in the NRP are designed to support existing White House policy mechanisms and decision-making entities during the response to a specific threat or incident. Also, while the NRP itself creates no new authorities, it serves to unify and enhance the incident management capabilities and resources of individual agencies and organizations acting under their own authorities in response to a wide array of potential threats and hazards.

The NRP:

- Establishes a comprehensive, national, all-hazards approach to domestic incident management.
- Is predicated on NIMS.

- Provides the structure and mechanisms for national-level policy and operational coordination for domestic incidents.
- Does not alter or impede federal, state, local, or tribal governments and agencies' specific authorities.
- Assumes that incidents typically are managed at the lowest possible geographic, organizational and jurisdictional level.

HSPD-5 — The National Incident Management System

On February 28, 2003, President Bush issued HSPD-5. The purpose of HSPD-5 is "to enhance the ability of the United States to manage domestic incidents by establishing a single, comprehensive national incident management system." This excerpt from HSPD-5 summarizes the key goals of creating the NIMS (emphasis added):

> (15) The Secretary shall develop, submit for review to the Homeland Security Council, and administer a National Incident Management System (NIMS). This system will provide a **consistent nationwide approach for Federal, State, and local governments** to work effectively and efficiently together to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity. To provide for **interoperability and compatibility among Federal, State, and local capabilities**, the NIMS will include **a core set of concepts, principles, terminology, and technologies** covering the incident command system; multi-agency coordination systems; unified command; training; identification and management of resources (including systems for classifying types of resources); qualifications and certification; and the collection, tracking, and reporting of incident information and incident resources.

One of the most important concepts of NIMS is the scope of the effort to integrate federal, state, and local government planning, preparation, and response capabilities. Implementing a consistent nationwide approach to responding and recovering from domestic incidents requires cooperation and investment by responders at all levels of government to harmonize their efforts. HSPD-5 also describes the creation of the NRP.

HSPD-5 requires all federal departments and agencies to adopt NIMS and to use it in their individual domestic incident management and emergency prevention, preparedness, response, recovery, and mitigation programs and activities, as well as in support of all actions taken to assist state, local or tribal entities. **The directive also requires federal departments and agencies to make adoption of NIMS by state and local organizations a condition for federal preparedness assistance (through grants, contracts and other activities).**

The National Incident Management System

On March 1, 2004, after close collaboration with state and local government officials and representatives from many public safety organizations, the Department of Homeland Security

(DHS) issued NIMS. NIMS represents a core set of doctrine, principles, terminology and organizational processes to enable effective, efficient and collaborative incident management at all levels. To provide the framework for interoperability and compatibility, NIMS is designed to achieve a practical balance between flexibility and standardization. NIMS establishes the Incident Command System (ICS) as the standard incident organizational structure for the management of all incidents.

NIMS integrates existing best practices into a consistent, nationwide approach to domestic incident management that is applicable at all jurisdictional levels and across functional disciplines in an all-hazards context. Six major components make up this systems approach. Of these components, the concepts and practices for command and management and preparedness are the most fully developed, reflecting their regular use by many jurisdictional levels and agencies responsible for incident management across the country. Resource management, communications and information management, supporting technologies, and ongoing management and maintenance introduce many concepts and requirements that also are integral to NIMS, but that will require further collaborative development and refinement over time. Although there is a heavy reliance on technology to link the components of NIMS, the success of NIMS will depend largely on whether state, local and tribal governments also adopt key implementation strategies that accompany the use of new technologies.

The following discussion, summarized from the NIMS document (see NIMS, March 1, 2004, at http://www.fema.gov/nims), provides a brief synopsis of each major component of NIMS, as well as how these components work together as a system to provide the national framework for preparing for, preventing, responding to, and recovering from domestic incidents, regardless of cause, size or complexity.

Command and Management

The NIMS command and management component is based on three key organizational systems: the ICS, Multiagency Coordinating System (MACS), and public information systems. The ICS defines the operating characteristics, interactive management components, and structure of incident management and emergency response organizations engaged throughout the life cycle of an incident. MACS define the operating characteristics, interactive management components, and organizational structure of supporting and coordinating those entities engaged at the federal, state, local, tribal and regional levels through mutual-aid agreements and other assistance arrangements. Public information systems refer to processes, procedures and systems for communicating timely and accurate information to the public during crisis or emergency situations.

Preparedness

Effective incident management begins with a host of preparedness activities conducted on a "steady-state" basis, well in advance of any potential incident. Preparedness involves an integrated combination of planning, training, exercises, personnel qualification and certification

standards, equipment acquisition and certification standards, and publication management processes and activities.

Planning describes how personnel, equipment and other resources are used to support incident management and emergency response activities. Plans provide mechanisms and systems for setting priorities, integrating multiple entities and functions, and ensuring that communications and other systems are available and integrated in support of a full spectrum of incident management requirements. Mutual-aid agreements may be a substantial part of this planning effort. These agreements may extend far beyond the contiguous jurisdictions to include similar resources in another part of the state or even another state. Information about interstate mutual-aid agreements can be found at http://www.emacweb.org/.

Training includes standard courses on multiagency incident command and management, organizational structure, and operational procedures; discipline-specific and agency-specific incident management courses; and courses on the integration and use of supporting technologies. Required baseline ICS training, depending upon an individual's function/role within an incident management structure, is based around four standard levels of ICS training:

1. I-100 (Introduction to ICS).

2. I-200 (Basic ICS).

3. I-300 (Intermediate ICS).

4. I-400 (Advanced ICS).

ICS training that has been developed, managed or administered by **Fi**re **Res**ources of **C**alifornia **O**rganized for **P**otential **E**mergencies (FIRESCOPE), the National Wildfire Coordinating Group (NWCG), the National Fire Academy (NFA), or Emergency Management Institute (EMI) is considered NIMS-compliant. New Web-based, blended learning and classroom-format I-100, I-200, I-300, and I-400 courses have been developed jointly by the U.S. Fire Administration's (USFA's) National Fire Programs Division, EMI, U.S. Department of Agriculture, and the NWCG, with the support of the NIMS Integration Center (NIC).

Incident management organizations and personnel must participate in realistic exercises — including multidisciplinary, multijurisdictional and multisector interaction — to improve integration and interoperability and optimize resource use during incident operations.

Qualification and certification activities are undertaken to identify and publish national-level standards and measure performance against these standards to ensure that incident management and emergency responder personnel are qualified appropriately and certified officially to perform NIMS-related functions. The NIC retains the responsibility for establishing the criteria for compliance, developing related standards, and designing the qualification and certification process for implementation by the states.

Incident management organizations and emergency responders at all levels rely on various types of equipment to perform mission-essential tasks. A critical component of operational preparedness is the acquisition of equipment that will perform to certain standards, including the capability to be interoperable with similar equipment used by other jurisdictions.

Publications management refers to forms and form standardization, developing publication materials, administering publications — including establishing, naming, and numbering conventions, managing the publication and promulgation of documents, and exercising control over sensitive documents — and revising publications when necessary.

Communications and Information Management

The NIMS identifies the requirement for a standardized framework for communications, information management (collection, analysis and dissemination), and information sharing at all levels of incident management. These elements are incident management, communications, and information management. Incident management organizations must ensure that effective, interoperable communications processes, procedures and systems exist to support a wide variety of incident management activities across agencies and jurisdictions. Information management processes, procedures and systems help ensure that information, including communications and data, flow efficiently through a commonly accepted architecture supporting numerous agencies and jurisdictions responsible for managing or directing domestic incidents, those affected by the incident, and those contributing resources to the incident management effort. Effective information management enhances incident management and response, and helps ensure that crisis decision-making is better informed.

Supporting Technologies

Technology and technological systems provide supporting capabilities essential to implementing and continuously refining NIMS. These include voice and data communications systems, information management systems (i.e., recordkeeping and resource tracking), and data display systems. Also included are specialized technologies that facilitate ongoing operations and incident management activities in situations that call for unique technology-based capabilities.

Ongoing Management and Maintenance

This component establishes an activity to provide strategic direction for and oversight of NIMS, supporting both routine review and the continuous refinement of the system and its components over the long term. This is one of the primary responsibilities of the NIC. The NIC is a multijurisdictional, multidisciplinary entity made up of federal stakeholders and state, local, and tribal incident management and first responder organizations.

Within DHS, the NIC establishes required compliance dates and facilitates the development of standards, guidelines and compliance protocols for determining whether a federal, state, local or

tribal entity has adopted the required aspects of NIMS. The NIC also will publish, on an ongoing basis, additional standards, guidelines and compliance protocols for the aspects of NIMS not yet fully developed.

The NIC has developed a Web page to provide updated information and resources to assist with NIMS implementation (www.fema.gov/nims). Included is information about required and supplemental training for all responders. A downloadable, PDF version of NIMS also can be found on this website.

States and local jurisdictions were required to be in compliance with NIMS no later than October 1, 2006. Compliance with certain aspects of NIMS is possible prior to that date, such as institutionalizing the use of ICS. Other key technology-dependent aspects of NIMS may require additional development and refinement to enable compliance by state, local and tribal governments at a future yet-to-be-determined date (e.g., data and communications systems interoperability).

An online, independent study program called the "National Incident Management System, An Introduction" provides an overview of NIMS. The course can be found on the National Emergency Training Center (NETC) Virtual Campus, accessible from http://training.fema.gov. The course number is IS-700. Responders at the local, state and federal level are required to complete this training as a requirement under NIMS.

DIFFERENCES BETWEEN FIRE RESOURCES OF CALIFORNIA ORGANIZED FOR POTENTIAL EMERGENCIES INCIDENT COMMAND SYSTEM AND NATIONAL INCIDENT MANAGEMENT SYSTEM INCIDENT COMMAND SYSTEM

The ICS established in NIMS is based on the **ICS** developed by FIRESCOPE. With the exception of how the Information and Intelligence function is handled, the principles and concepts of NIMS ICS are the same as the FIRESCOPE ICS — the same ICS used in the National Interagency Incident Management System (NIIMS). (See www.fema.gov/nims for a history of ICS.)

The ICS organization has five major functions: Command, Operations, Planning, Logistics and Finance/Administration. In NIMS ICS, a potential sixth functional area can be established. The Information and Intelligence function provides analysis and sharing of information and intelligence during an incident. Intelligence can include national security or classified information but also can include operational information such as risk assessments, medical intelligence, weather information, structural designs of buildings, toxic contaminant levels, etc., that may come from a variety of sources. Traditionally, the Information and Intelligence function is located in the Planning Section. However, in exceptional situations, the Incident Commander (IC) may need to assign this role to other parts of the ICS organization. Under NIMS ICS, the Information and Intelligence function may be assigned in one of the following ways:

- Within the Command Staff.
- As a unit within the Planning Section.

- As a branch within the Operations Section.
- As a separate General Staff Section.

The only other difference between NIMS ICS and FIRESCOPE ICS is the title of the Command Staff position, Public Information Officer (PIO). The use of this title more clearly differentiates the responsibility to coordinate information for the public from coordinating information and intelligence gathering for resolving the incident.

The NIC was established to provide "strategic direction for and oversight of the NIMS … supporting both routine maintenance and the continuous refinement of the system and its components over the long term." The NIC will oversee all aspects of NIMS through multidiscipline working groups that facilitate the development of standards, systems and resources to meet NIMS goals fully. It is situated in DHS's FEMA. When fully staffed, the NIC will be a multijurisdictional, multidisciplinary entity made up of federal stakeholders and state, local, and tribal incident management and first-responder organizations.

Some efforts that the NIC will be undertaking during its first few years:

- Implementing a nationwide system for the qualification, certification, and credentialing of incident management personnel and organizations, based on existing national consensus standards.
- Facilitating the development of national standards for qualification and certification of incident management personnel and equipment where no such standards exist.
- Providing guidance and tools to help participants understand and comply with NIMS as they implement the system.

Some examples of NIMS products and resources:

- IS-700, "NIMS, An Introduction," which can be taken online through the NETC Virtual Campus or can be downloaded for a classroom delivery from the USFA website.
- NIMSCAST — Compliance Assurance Support Tool — a checklist for adopting NIMS: http://www.fema.gov/nimscast/index.jsp.
- Model mutual-aid agreements.
- Resource typing definitions.
- ICS training information.

The National Response Plan

Issued in 1992, the Federal Response Plan (FRP) outlined how the federal government implemented the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, to assist state and local governments, when a major disaster or emergency overwhelmed their ability to respond effectively to save lives, protect public health, safety, and property, and restore their communities. The FRP described the policies, planning assumptions, concept of operations, response and recovery actions, and responsibilities of 25 federal departments and agencies and the American Red Cross. The FRP guided federal operations following a presidential declaration of a major disaster or emergency.

The Homeland Security Act of 2002 and HSPD-5 mandated the development of an NRP that would define a single comprehensive national approach to incidents requiring federal response and assistance. Additionally, the NRP identifies coordination structures and mechanisms, direction for the incorporation and concurrent implementation of existing plans, and a consistent approach to reporting incidents. The NRP also requires providing incident assessments and making recommendations to the president, DHS secretary, and the Homeland Security Council (HSC).

Specifically, HSPD-5 tasks the secretary of DHS as follows (emphasis added):

> (16) The Secretary shall develop, submit for review to the Homeland Security Council, and administer a National Response Plan (NRP). The Secretary shall consult with appropriate Assistants to the President (including the Assistant to the President for Economic Policy) and the Director of the Office of Science and Technology Policy, and other such Federal officials as may be appropriate, in developing and implementing the NRP. **This plan shall integrate Federal Government domestic prevention, preparedness, response, and recovery plans into one all-discipline, all-hazards plan.** The NRP shall be unclassified. If certain operational aspects require classification, they shall be included in classified annexes to the NRP.
>
> (a) The NRP, using the NIMS, shall, with regard to response to domestic incidents, provide the structure and mechanisms for national level policy and operational direction for Federal support to State and local incident managers and for exercising direct Federal authorities and responsibilities, as appropriate.
>
> (b) The NRP will include protocols for operating under different threats or threat levels; incorporation of existing Federal emergency and incident management plans (with appropriate modifications and revisions) as either integrated components of the NRP or as supporting operational plans; and additional operational plans or annexes, as appropriate, including public affairs and intergovernmental communications.
>
> (c) The NRP will include a consistent approach to reporting incidents, providing assessments, and making recommendations to the President, the Secretary, and the Homeland Security Council.
>
> (d) The NRP will include rigorous requirements for continuous improvements from testing, exercising, experience with incidents, and new information and technologies.

The NRP creates a single "all-hazards" federal plan for prevention, preparedness, response and recovery plans: "The NRP is built on the template of NIMS, which provides a consistent doctrinal framework for incident management at all jurisdictional levels, regardless of the cause, size, or complexity of the incident."

The NRP supersedes the FRP, the Domestic Terrorism Concept of Operations Plan (CONPLAN), the Federal Radiological Emergency Response Plan (FRERP), and the Initial National Response Plan (INRP). Many of the familiar concepts and mechanisms associated with these plans have been carried over to the NRP, such as the Emergency Support Function (ESF) components of the FRP. Elements institutionalized in the NRP include the Homeland Security Operations Center (HSOC), Interagency Incident Management Group (IIMG), Principal Federal Official (PFO), and the Joint Field Office (JFO).

The NRP, as the base plan, establishes the national framework for assessing domestic incidents to determine the appropriate level of federal involvement. It is designed to link to an array of national-level hazard-specific contingency plans, such as the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), which is a plan for guiding federal response to oil spills or releases of hazardous substances. These contingency plans can be implemented independently during localized incidents or concurrently with the NRP to coordinate interagency incident management efforts, using NIMS for events considered Incidents of National Significance.

The NRP defines Incidents of National Significance as those that meet the following criteria:

- When another federal department or agency has requested DHS assistance.
- When state/local capabilities are overwhelmed and federal assistance is requested.
- When an incident substantially involves more than one federal department/agency.
- When the secretary of DHS has been directed by the president to assume incident management responsibilities.

National Response Plan Components

The following identifies the component parts of the NRP:

The **Base Plan** describes the structure and processes comprising a national approach to domestic incident management designed to integrate the efforts and resources of federal, state, local, tribal, private sector, and nongovernmental organizations. The Base Plan includes planning assumptions, roles and responsibilities, concept of operations, incident management actions, and plan maintenance instructions.

The **Appendices** provide other relevant, more detailed supporting information, including terms, definitions, acronyms, authorities and a compendium of national interagency plans.

The **Emergency Support Function (ESF) Annexes** detail the missions, policies, structures, and responsibilities of federal agencies for coordinating resource and programmatic support to states, tribes, and other federal agencies or other jurisdictions and entities during Incidents of National Significance. The introduction to the ESF Annexes summarizes the functions of ESF coordinators and primary and support agencies. (Note that there is an increase in the number of ESFs in the NRP, to 15, from the original 12 in the old FRP.) The ESF Annexes include:

- ESF 1 — Transportation.
- ESF 2 — Communications.
- ESF 3 — Public Works and Engineering.
- ESF 4 — Firefighting.
- ESF 5 — Emergency Management.
- ESF 6 — Mass Care, Housing, and Human Services.
- ESF 7 — Resource Support.
- ESF 8 — Public Health and Medical Services.
- ESF 9 — Urban Search and Rescue.
- ESF 10 — Oil and Hazardous Materials Response.
- ESF 11 — Agriculture and Natural Resources.
- ESF 12 — Energy.
- ESF 13 — Public Safety and Security.
- ESF 14 — Long-term Community Recovery and Mitigation.
- ESF 15 — External Affairs.

The **Support Annexes** provide guidance and describe the functional processes and administrative requirements necessary to ensure efficient and effective implementation of NRP incident management objectives. The Support Annexes are described below:

- **Financial Management** provides guidance for NRP implementation to ensure that incident-related funds are provided expeditiously and that financial management activities are conducted in accordance with established laws, policies, regulations and standards. (For the purposes of the NRP, "hazardous materials" is a general term intended to include hazardous substances, pollutants and contaminants as defined by the NCP.)

- **International Coordination** provides guidance for carrying out responsibilities regarding international coordination in support of the federal response to domestic Incidents of National Significance.

- **Logistics Management** describes the framework within which the overall NRP logistics management function operates. It also outlines logistics management responsibilities and mechanisms for integrating federal, state, local and tribal resource providers.

- **Private Sector Coordination** outlines processes to ensure effective incident management coordination and integration with the private sector, including representatives of the nation's Critical Infrastructure and Key Resources (CIKR) sectors and other industries.

- **Public Affairs** describes interagency incident communications procedures designed to enable the coordination and dissemination of timely, public information during Incidents of National Significance.

- **Science and Technology** provides guidance and mechanisms to ensure that all levels of government can leverage the nation's science and technology resources efficiently and effectively in the management of Incidents of National Significance.

- **Tribal Relations** describes the policies, responsibilities, and concept of operations for effective coordination and interaction with tribal governments and communities during Incidents of National Significance.

- **Volunteer and Donations Management** provides guidance on volunteer and donations management functions related to Incidents of National Significance.

- **Worker Safety and Health** details processes to ensure coordinated, comprehensive efforts to identify responder safety and health risks and implement procedures to minimize or eliminate illness or injuries during incident management and emergency response activities.

The **Incident Annexes** address contingency or hazard situations requiring specialized application of the NRP. The Incident Annexes describe the missions, policies, responsibilities and coordination processes that govern the interaction of public and private entities engaged in incident management and emergency response operations across a spectrum of potential hazards. These annexes typically are augmented by a variety of supporting plans and operational supplements. The Incident Annexes are described below:

- The **Biological Incident Annex** describes incident management activities related to a biological terrorism event, pandemic, emerging infectious disease, or novel pathogen outbreak.

- The **Catastrophic Incident Annex** establishes the strategy for implementing and coordinating an accelerated national response to a catastrophic incident.

- The **Cyber Incident Annex** establishes procedures for a multidisciplinary, broad-based approach to the preparation for remediation and recover from catastrophic cyber events affecting critical national processes and the national economy.

- The **Food and Agriculture Incident Annex** describes incident management activities related to a terrorist attack, major disaster, or other emergency involving the nation's agriculture and food systems. (To be published in a subsequent version of this plan.)

- The **Nuclear/Radiological Incident Annex** describes incident management activities related to nuclear/radiological incidents.

- The **Oil and Hazardous Materials Incident Annex** describes incident management activities related to certain nationally significant oil and hazmat pollution incidents.

- The **Terrorism Incident Law Enforcement and Investigation Annex** describes law enforcement and criminal investigation structures and processes in response to a terrorist event.

A basic premise of the NRP is that incidents are handled at the lowest governmental level possible. DHS becomes involved through the routine reporting and monitoring of threats and incidents, and/or when notified of an incident or potential incident of the severity, magnitude, complexity and/or threat to homeland security that it is considered an Incident of National Significance. DHS then will establish multiagency structures at the headquarters, regional, and field level to coordinate efforts and provide support to the on-scene incident command structures. Other federal agencies carry out their incident management and emergency response authorities within this overarching framework.

The NRP replaces certain federal plans, e.g., the FRP, while providing for the coordination of remaining plans during Incidents of National Significance. The NRP requires the compliance and participation of federal departments and agencies. Although it is intended specifically for federal agencies, state and local governments are encouraged to work within the concept of operations and to understand the role/function of coordinating federal agencies within the NRP.

The NIC is charged with validating compliance with the NRP as well as providing guidance and tools to help all relevant parties, including state and local governments, to understand and comply with the NRP and NIMS. An initial review of the NRP will occur one year after implementation. Following this, the NRP will be subject to a deliberate four-year review and reissuance cycle.

The NRP can be found on the NIC website (http://www.fema.gov/nims). An online, independent study program called, "The National Response Plan," can be found on the NETC Virtual Campus (http://training.fema.gov/). The course number is IS-800.A.

INTRODUCTION TO THE INCIDENT COMMAND SYSTEM

Federal regulations on hazmat response mandate how to manage the incident. Many of the directives in the regulations and standards may be somewhat unfamiliar to many responders. This is true for two reasons. First, until recently, the specified management system generally has been a fire-service system. Second, hazmat scene setup considerations and related concepts are quite different from most routine emergency response situations. In this unit, we will explore some of the similarities and differences.

With the implementation of NIMS, there should be a standardization of the ICS used throughout the country. This course will focus on the use of NIMS during response to a hazmat incident. The mainstays of NIMS include:

- Command and management.
- Preparedness.
- Resource management.

- Communications and information management.
- Supporting technologies.
- Ongoing management and maintenance.

History of the Incident Command System

In the early 1970s, southern California experienced several devastating wildland fires. The overall cost and loss associated with these fires totaled $18 million per day. This multijurisdictional disaster was the impetus for the development of an improved interagency incident management system known as ICS. ICS is one of the most beneficial results of a federally funded project called FIRESCOPE that was convened after these fires. Its charter was to examine various aspects concerning interagency response to incidents.

FIRESCOPE derives its name from the following words: **Fi**re **Res**ources of **C**alifornia **O**rganized for **P**otential **E**mergencies. The FIRESCOPE ICS is primarily a command and control system delineating (job) responsibilities and organizational structure for the purpose of managing day-to-day operations for all types of emergency incidents. While originally developed for wildland incidents, it was found that the system could be applied easily to day-to-day fire and rescue operations. It also is flexible enough to manage catastrophic incidents involving thousands of emergency response and management personnel.

The NIIMS is another system using ICS that was developed by the wildland community in order to provide a common system for wildland fire and protection agencies on local, state and federal levels. The NIIMS organization includes the following agencies: Bureau of Land Management, Bureau of Indian Affairs, U.S. Fish and Wildlife Service, U.S. Forest Service, representatives of State Foresters, and the National Park Service. NIIMS consists of five major subsystems that collectively provide a total systems approach to risk management:

1. The ICS that includes operating requirements, eight interactive components, and procedures for organizing and operating an on-scene management structure.

2. Training that is standardized and supports the effective operations of NIIMS.

3. A qualifications and certification system that provides personnel across the national standard training, experience, and physical requirements for filling specific positions in the ICS.

4. Publications management that includes the development, publication, and distribution of NIIMS materials.

5. Supporting technologies such as orthophoto mapping, infrared photography, and a multiagency coordination system that supports NIIMS operations.

Since the time ICS was developed, several challenges have been experienced by the fire service in understanding its application. As a result, inconsistencies in the system began to develop as well as other hybrid systems which further distanced a common approach to Incident Command.

A single Incident Management System (IMS) is critical to effective command and control of major incidents. On these incidents, a single department may interface with other agencies on the local, state and federal level. In order to reduce the inherent confusion that may be associated with larger-scale incidents, involving a common Command system is a must.

Recognizing the challenges that were occurring in the fire service in applying a common approach to Incident Command, the National Fire Service IMS Consortium was created in 1990 in order to evaluate an approach to developing a single Command system. The Consortium consists of many individual fire service leaders, representatives of most major fire service organizations, and representatives of federal agencies including FIRESCOPE. One of the significant outcomes of the work done by the Consortium was the identification of the need to develop operational protocols within ICS, so that fire and rescue personnel could apply ICS as one common system. As a result of this, the IMS Consortium completed its first document in 1993: "Model Procedures Guide for Structural Firefighting," and FIRESCOPE adopted this in principle as an application to the Model FIRESCOPE Command System. The basic premise is that the organizational structure found in the FIRESCOPE ICS now is enhanced with operational protocols that allow the nation's fire and rescue personnel to apply ICS effectively regardless of what area in the country one is assigned. NFA, having adopted the FIRESCOPE ICS in 1980, incorporated this material in its training curricula.

Following the terrorist attacks of 2001, President Bush issued HSPD-5 which, among other things, required the development and implementation of a single ICS for use by all agencies. The DHS implemented this process with a mandate for all agencies to adopt NIMS or risk losing federal assistance by September 2005.

Incident Command System at Hazardous Materials Incidents

A hazmat incident emergency has no respect or regard for whatever boundaries we have assigned to our geographic locations. An emergency also can require the involvement of several levels of government. Local incidents, in most instances, require the response and assistance of several of the jurisdiction's agencies. A state response is required if the incident affects state land or is beyond the capabilities of the local response agencies. Federal agencies will respond when the incident occurs on federal land or if the need for a long-term cleanup exists.

Industrial responders may be called to the scene when specialized resources are needed, or when the potential responsible party is a private industry.

Both the Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) Part 1910.120 and the Environmental Protection Agency's (EPA) 40 CFR Part 311 regulations state: "The Senior Emergency Response Official responding to a (chemical) emergency shall become the individual in charge of the Site-Specific ICS." Essentially, this means that all hazmat emergency responders must operate using an ICS.

Because hazmat incidents, like most incidents, are dynamic, frequent shifts within the plan of action must be anticipated. The ICS provides an effective and efficient system that is capable of

managing even the most complex situation with a great degree of flexibility, control and reliability.

Large-Scale Resource Management

Large-scale incidents require not only many response agencies but also large amounts of resources. All response agencies have a certain amount of resources they will bring with them, thus adding to the scope of the incident.

Hazmat releases may not stay within jurisdictional boundaries. Air and water releases may migrate great distances in a short period of time. These large-scale incidents require a multiagency and/or a multijurisdictional response. No single agency has or can handle all of the resource needs of a large-scale hazmat incident.

UNIFIED COMMAND

Three levels of ICS are available for implementation at a hazmat incident, depending on the incident's scale: the single Command, the Unified Command, and the Emergency Operations Center (EOC)/ICS.

Single versus Unified Command

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

Single Command is established only when the incident involves primarily one agency and the incident occurs within a single jurisdiction. That agency must have a predetermined IC as designated in the emergency response plan. The IC in this instance is responsible for developing all strategic goals.

Hazmat incidents, mass casualty incidents, natural disasters, or wildland fires, among others, may involve a number of jurisdictions and agencies that have a legal need to be involved directly in the decision-making process. If each of these responsible agencies were to establish a Command Post (CP) of its own, separate and distinct from the others, chaos would ensue. In these instances, it is critical that there be a Unified Command.

The concept of Unified Command simply means that all agencies with a functional responsibility at a multiagency or multijurisdictional incident contribute to the process. They all help:

- Determine strategies.
- Determine overall incident objectives.
- Plan jointly for tactical objectives.
- Maximize use of all assigned resources.

There are various cues for a Unified Command.

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

  Example: A passenger airline crash within a national forest. Local fire, local medical, federal forestry, and the National Transportation Safety Board (NTSB) are all involved.

- More than one jurisdiction is involved.

  Example: A major flood or hurricane affects many counties.

- The extent of the incident.

  Example: An inland waterway entirely within the boundaries of a single jurisdiction could also involve Department of Fish and Game and the U.S. Coast Guard (USCG).

All agencies with responsibility to manage some part of the incident contribute to the Command process. Together they determine overall incident objectives, determine strategies, and plan tactics jointly. This collaboration ensures maximum use of assigned resources. The Command structure includes one key official from each responsible jurisdiction or agency. It also may involve representatives from the departments when only a single jurisdiction is involved.

A Unified Command structure should consist of a key official from each jurisdiction in a multijurisdictional situation, or several functional departments within a single political jurisdiction. As an option, a Unified Command structure could include land owners or individuals or agencies that have functional expertise or capabilities.

The IC may be determined by local or state law. For example, California law states that the law enforcement agency representative is the IC for hazmat incidents on the highways. Where there is no law determining who is in charge, agencies should plan ahead to determine which agency takes the lead for each risk a community faces.

To function well, this system needs common objectives and strategy on major multi-jurisdictional or multiagency incidents. The strategy and tactics then guide the development of the Incident Action Plan (IAP). Under the Unified Command structure in the ICS, the implementation of the IAP occurs under the direction of a single individual, the Operations Section Chief (OSC).

The OSC normally will be from the agency that has the greatest jurisdictional involvement. All agencies having jurisdictional and functional responsibility at the incident must agree on the designation of the OSC.

Differences Between Single and Unified

In a single Command structure, a single IC is solely responsible for management of the incident. In a single Command structure, the implementation of strategy and tactics to achieve operational control is the responsibility of one person, the OSC. In a Unified Command structure, individuals designated by involved jurisdiction/departments jointly determine objectives, strategy and priorities.

The determination of which jurisdiction or agency the OSC represents must be made by mutual agreement of the Unified Command.

Emergency Operations Center

The EOC and the EOC/ICS interface issue appears in another portion of this Student Manual (SM). EOC activation is required when long-term operations are anticipated, the incident is very complex in nature, or a disaster or catastrophic situation develops. **EOC activation serves to relieve the IC of some administrative duties, but not Command or responsibility for the incident.**

Large-scale operations at incidents involving threats to the entire community or beyond may require the appearance of a federal on-scene coordinator. This coordinator will be from the USCG if the incident involves navigable waterways, or from the EPA if the incident is inland, and the USCG and EPA may operate in each other's jurisdiction if necessary. The coordinator's role is to make the resources of the federal government available to the IC.

Roles and Responsibilities

Responders to the incident have specific roles and responsibilities as designated by statutes and the emergency response plan.

The fire service may provide — among other functions — first-response personnel, citizen rescue, and the response teams to perform incident control measures. Law enforcement may be responsible for evacuation, site and crowd control, and investigation of the incident. EMS provides medical care of injured or exposed persons, transportation to medical treatment facilities, and medical monitoring of incident response personnel. Other agencies (emergency management, health, etc.) may be responsible for cleanup activities and monitoring of the incident.

Depending on the nature of the incident, agencies such as fish and game enforcement and habitat divisions, which provide habitat information and supervision, and Public Works which provides heavy equipment, support, and some supplies such as sand and dirt, may become involved.

Incident Command System Management Levels

The ICS organizational structure develops in modular fashion from the top down at any incident; the specific ICS organizational structure for a hazmat incident is based on the incident's needs. **The IC and the Safety Officer are always appointed.** If other positions of responsibility are not needed, the IC assumes those duties. Command and General Staff positions are discussed below.

Note that the material in this SM is not intended to be a complete presentation of the system, but only a refresher. Further training in ICS may be required.

General Staff

Within ICS management levels there are five functional areas, or General Staff. These include the IC, Operations Section, Planning Section, Logistics Section, and the Finance/Administration Section. The person appointed to the position of chief of each of these sections has very specific duties. Again, if the IC chooses not to fill any of these positions, the IC assumes those duties.

Incident Commander

The IC is the overall manager of the incident and scene. The IC is responsible for developing strategic goals for the incident, a task accomplished through the development and implementation of an IAP, also known as the Plan of Action.

OSHA regulations mandate that the IC position be filled (29 CFR 1910.120(q)). The National Fire Protection Association (NFPA) 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents* (5 1.2) states that the IC will direct and coordinate all aspects of a hazmat incident. Under either the regulation or the standard, the IC is ultimately responsible for all actions taken by all responders at the emergency scene.

Functions of Command

There are three very critical functions of Command:

1. Assume and announce Command and establish an effective operating position (CP).

2. Rapidly evaluate the situation (size up).

3. Initiate, maintain and control the communications process.

Used in priority:

- Identify the incident objectives, develop an IAP, and assign resources consistent with plans and standard operating procedures (SOPs).

- Develop an effective Incident Command organization.
- Provide strategies and tactics.
- Review, evaluate and revise (as needed) the IAP.
- Provide for the continuity, transfer and termination of Command.
- Provide for safety and personnel accountability.

The IC is responsible for all these functions. As Command is transferred, so is the responsibility for the functions. The first five functions must be addressed immediately from the initial assumption of Command.

Operations Section Chief

The OSC is responsible for managing, directing and coordinating all tactical operations at the incident. As part of his or her role, the OSC consults with the IC on the IAP, operational plans, tactical objectives, and the overall response. The OSC also supervises the Staging Area Manager. Filling the position of OSC relieves the IC of the burden of making tactical determinations and assignments.

Staffing Operations

The Operations Section is responsible for the direct management of all incident tactical activities, tactical priorities, and the safety of personnel working in the Operations Section.

The most common reason for staffing Operations is to relieve the span-of-control problem for the IC. This span-of-control problem occurs when the number of Branches, Divisions and Groups, coupled with staffed Planning and/or Logistics Section elements, exceeds the IC's ability to manage effectively. The IC then is able to focus attention on the overall management of the entire incident as well as to interact with the Command and General Staff.

A complex incident, in which the IC needs assistance determining strategic goals and tactical objectives, also may require implementing Operations.

However, Operations should be staffed only to improve the management of the incident. If it is not used to maintain a manageable workload or an effective span of control, the IC could end up with a span of control of one.

After Operations is implemented, the duties of the IC are modified slightly. Operations will be responsible for all operations, resources and accomplishment of specific activities. The IC will be responsible for the development of the incident strategy and the communication of that strategy to the OSC.

Branches under the Operations Section may consist of hazmat, medical, rescue, law enforcement and others as needed. Branches are the organizational level responsible for performing the

operations for major segments of the incident. The Branch level reports to the Section level and manages the Division or Group level.

Division is the organizational level having responsibility for functions within a defined geographical area. Divisions provide coordination and control of operations when several Units are assigned to perform a function within the geographical area.

Group is the designation given to multiple resources assigned to a function within the incident. An example would be the Hazmat Group which provides the resources and skilled personnel to manage the hazmat mitigation function at the incident.

Even during large, complex incidents, the IC appoints only one OSC. This person should be selected from the agency having the greatest resource commitment, unless preplanning dictates selection from a specific agency.

Progress Reports

An agency's communications guidelines should include communications necessary to gather and analyze information to plan, issue orders, and supervise operations. For example, a tactical level officer should communicate the following:

- Assignment completed.
- Additional resources required.
- Inability to complete the assignment.
- Special information.
- Personnel accountability report.
- Operational location.

It is imperative for the IC to understand what is happening at an incident scene. Once orders are given to Group/Division Supervisors, or Branch Directors, feedback is critical to that understanding. The items listed above allow the IC to effectively understand to what point the various operations have progressed. Through these reports, the IC can track actions done or completed, needed additional resources for any given assignment, a needed tactical change to overcome an impossible task, and other special factors, such as safety, requiring attention.

Progress reports are essential to incident management. They allow for effective decision-making and assist in prioritizing the commitment of resources. Progress reports allow for effective refinement and revision of the IAP. To be effective, progress reports need to be timely, complete and concise.

Progress reports should briefly detail the location and type of completed actions and those being undertaken. For example, a Vent Group Supervisor directed to do vertical and horizontal ventilation may provide a progress report as follows:

> Vertical ventilation will be completed in about five minutes. Horizontal ventilation of the fire floor is completed. Ventilation of the floor above is just beginning.

Progress reports will occur with greater frequency in the early stages of an incident, typically every five to 15 minutes, or as major parts of the job are completed. An IC or OSC must request progress reports from subordinate personnel on a periodic basis, when these reports are not given by those personnel. Some departments have the dispatch center announce time on location every 15 minutes to assist the IC with time-tracking, and these act as a mind jogger for the progress reports. It is important to ensure that, if time tracking is done, emergency communication procedures are not overridden by these reports.

In catastrophic events, using large numbers of resources and a large ICS organization, it is critical that all General Staff know the progress of operations on a timely basis. Branch Directors must query their subordinate Group and Division Supervisors frequently as to the state of their operations. This information must be forwarded to the OSC and upward to the IC.

Without the progress report information, the IC, as well as the OSC and Planning Section Chief (PSC), will find his or her information processing ability lessened. Often he or she will initiate or recommend actions that are unneeded as well as being untimely for the situation.

Planning Section Chief

The PSC is responsible for collecting, evaluating, dispersing and using information about the incident and available resources both at the time of the incident as well as in the hours or days ahead. Understanding the current situation creates a basis for accurate predictions to develop an overall estimate of incident course and harm. Proactive incident management depends on an accurate assessment of the incident's potential and prediction of likely results.

The Planning Section performs several functions. If the incident is small, the PSC may perform them all, but if the incident is large and complex, it is better to assign personnel to each component.

- The Resource Status (RESTAT) Unit is responsible for recording the status of resources committed to the incident. Further, this unit evaluates the expected need for additional resources, and the effect those resources will have on the incident. The leader advises the IC of possible future needs.

- The Situation Status (SITSTAT) Unit is responsible for analyzing the situation as it progresses, through recording and evaluating information about the status of the incident. Major questions this unit covers are:

  - What has happened?
  - What is happening now?
  - What might happen?

- The Documentation Unit records and protects all documents relating to the incident. This includes incident reports, communications logs, injury reports, RESTAT, and SITSTAT reports. Thorough documentation is critical to post-incident analysis.

- Technical specialists are persons with special skills or knowledge that may support incident operations. Examples include chemists, building maintenance engineers, and industry representatives. They are assigned anywhere in the ICS as needed.

- Demobilization is responsible for developing a plan for the demobilization of the resources committed to the incident and assisting in the implementation of the plan. In incidents requiring a major resource commitment, an efficient, safe, and cost-effective demobilization and return of resources to service depends on accurate planning.

Logistics Section Chief

The Logistics Section Chief (LSC) is responsible for facilities, services and materials for the incident. As incidents grow in size and complexity, the logistic needs increase significantly. The Logistics Section consists of two Branches, Service and Support.

The Service Branch provides Communications, Medical and Food Units to operational forces. The Communications Unit maintains and supervises the communication network. The Medical Unit provides treatment for emergency responders, but not civilians. Providing food to personnel at major incidents and during severe environmental conditions is a significant task assigned to the Food Unit.

Support Units provide personnel, equipment and supplies to support incident operations. Included in the Support Branch are Supply, Facilities and Ground Support Units. The Supply Unit maintains an ongoing inventory and control of resources, including self-contained breathing apparatus (SCBA) cylinders, foam concentrate, hazmat protective clothing, and other supplies. The Facilities Unit provides fixed facilities for the incident. This includes an incident base, and feeding, sanitary, and sleeping facilities. The Ground Support Unit is responsible for fueling, maintaining, and repairing vehicles, and for preparing a traffic plan.

Responder Rehabilitation

The IC needs to consider Responder Rehabilitation or “Rehab” during the initial planning stages of an emergency response. However, the climatic or environmental conditions of the emergency scene should not be the sole jurisdiction for establishing Responder Rehab. Any activity or incident that is large in size, long in duration, or labor intensive will deplete the energy and strength of personnel rapidly and therefore merits consideration for Responder Rehab.

A critical factor in the prevention of heat injury is the maintenance of water and electrolytes. Water replacement is critical during exercise periods and at emergency incidents. During heat stress, the member should consume at least one quart of water per hour. The rehydration solution should be a 50/50 mixture of water and a commercially-prepared activity beverage and

administered at about 40 F (4.4 C). Alcohol, caffeine and carbonated beverages should be avoided as they may interfere with the body's water conservation mechanisms.

Food is a necessity at the scene of an extended incident of three hours or more. A cup of stew, soup or broth is highly recommended because it is digested much faster than sandwiches and fast-food products. Fatty or salty foods should be avoided.

Hazmat incidents may call for a separate Responder Rehab in the Warm Zone adjacent to the Decontamination Unit when it is likely that these personnel may re-enter the Hot Zone. Personnel who have become contaminated would need to go through decontamination prior to going to the rehabilitation area. This method would facilitate the hazmat operations by reducing lead-time and turn-around time. While there are no specific ICS positions for these operations, it could be designated as Hazmat Rehab and have that Unit leader report to the Hazmat Group Supervisor.

The "two air bottle rule," or 45 minutes of work time, is recommended as an acceptable level prior to mandatory rehabilitation. Members shall rehydrate during exchange of SCBA cylinders. Firefighters having worked for 45 minutes (two full 30-minute-rated bottles) should immediately go to Responder Rehab for rest and evaluation. Rest should not be less than 10 minutes and may exceed an hour as determined by the Responder Rehab Manager. Crews released from Responder Rehab should be available in Staging to ensure that fatigued members are not required to return to duty before they are rested, evaluated and released by the Responder Rehab Manager.

Members in the rehabilitation area should maintain a high level of hydration. Members should not move from a hot environment directly into an air-conditioned area because the body's cooling system can shut down in response to the external cooling.

The most highly trained and qualified EMS personnel on the scene (at a minimum of basic life support (BLS) level) should provide EMS. They need to measure the member's heart rate for 30 seconds as early as possible in the rest period. If the member's heart rate exceeds 110 beats per minute, an oral temperature should be taken. If the member's temperature exceeds 100.6 F (38.1 C), that person should not be permitted to wear protective equipment. If it is below 100.6 F and the heart rate remains above 110 beats per minute, **rehabilitation time should be increased.** All medical evaluations should be recorded on standard forms along with the member's name and complaints. The Responder Rehab Manager or a designee should sign, time and date the form.

Members assigned to Responder Rehab should enter and exit as a crew. The crew designation, number of crew members, and the times of entry and exit from the Responder Rehab area are documented on the Company Check In/Out Sheet. Crews should not leave the Responder Rehab area until authorized by the Responder Rehab Manager.

Finance/Administration Section Chief

Finance is responsible for tracking all incident costs, evaluating the financial considerations, and providing financial documentation for the incident. The functional Units within Finance/ Administration are the Cost, Time, Procurement and Compensation/Claims Units.

The primary functions of the Cost Unit are tracking costs, analyzing cost data, making cost estimates, and recommending cost-saving measures. The primary function of the Time Unit is the timekeeping required for personnel working at the incident. When incident operations require procurement of goods or services from vendors, the Procurement Unit manages this function. The function of the Compensation/Claims Unit involves recordkeeping and financial concerns resulting from injuries or fatalities at the incident. The person in charge of this section also manages the legal risks of the incident.

Command Staff in the Incident Command System

Especially at large or complex incidents, the IC must consider the functions of safety, liaison and information. Staffing of these functions begins when the emergency response plan requires it, or the demands of these functions begin to interfere with the performance of the IC's Command duties.

Safety

Safety Officers report directly to the IC as mandated by OSHA. Their function is to monitor and assess the safety hazards and other unsafe conditions and to develop measures that ensure responder safety, and then suggest these measures to the IC. NFPA 1521, *Standard for Fire Department Safety Officer* provides a standard for Safety Officers. The Safety Officer has the authority to bypass the chain of command and correct unsafe conditions immediately but should inform the IC of these changes. Safety Officers must have a working knowledge of all hazmat operational approaches and options in order to determine their safety.

If the Incident Safety Officer either does not possess sufficient knowledge or expertise, or faces a large or complex incident, the officer may appoint an Assistant Safety Officer for hazardous materials. This person must be competent in the area of safety factors and concerns during hazmat responses. The Safety Officer at a hazmat incident must be knowledgeable in the operations completed by the Hazmat Team.

Public Information

The PIO also reports to the IC and is responsible for working with the media, thus freeing the IC for Command duties. The PIO is the clearing point for the release of information, and coordinates the release with the IC. Coordination reduces the risk of receiving and disseminating conflicting information from several sources. PIOs also keep the incident response personnel

informed of progress of operations. An effective method is periodic posting of general information during long-term operations.

Liaison

A Liaison Officer is the point of contact for agencies assisting in the operation. Liaison Officers also report directly to the IC. One of the Liaison Officer's roles is to coordinate the management of all assisting agencies, so as to avoid a duplication of effort. This allows each agency to do what it does best. Activated at large or complex incidents, the Liaison Officer must have a specific location where agencies report.

Some of the agencies and personnel who may report to the Liaison Officer include the federal OSC, the Red Cross or other volunteer agencies, and private contractors.

Span of Control

Span of control refers to the number of personnel who are reporting to any given individual. Optimum span of control in ICS is five, with an acceptable spread of two to seven. On a situation that is not yet under control, no one operating under ICS should have more than five personnel reporting back.

Span-of-control ratios depend on a number of factors.

- Training and experience level of subordinates. Poorly trained or less experienced personnel require more direct supervision, thereby lessening the number of subordinates one can manage effectively.

- Complexity of the incident. A hazmat incident may require more mental concentration, thereby leaving less time available to supervise personnel.

- Type of incident or timeframe of the incident. The speed of operations may influence span of control. A fast-moving incident may require a tighter span of control with fewer Divisions/Groups in place. In a slower-moving operation such as overhaul, the supervisor is less pressed for time for decision-making and therefore can manage more personnel/ Divisions/Groups.

For span-of-control purposes, the following are not counted as reporting to a supervisor: Safety Officer, Liaison Officer, PIO, and Staging Area Manager. In ICS, these positions basically are assistants to the IC, or in the case of Staging, also to the OSC.

OTHER COMMANDS AND CONSIDERATIONS

Area Command

An Area Command is an organization established to:

- Oversee the management of multiple incidents that are each being managed by an ICS organization.
- Oversee the management of large incidents that cross jurisdictional boundaries.

Area Commands are particularly relevant to public health emergencies because these incidents are typically:

- Not site specific.
- Not immediately identifiable.
- Geographically dispersed and evolve over time.

These types of incidents call for a coordinated response, with large-scale coordination typically found at a higher jurisdictional level.

The Area Command has the responsibility for:

- Setting overall strategy and priorities.
- Allocating critical resources according to the priorities.
- Ensuring that incidents are properly managed.
- Ensuring that objectives are met.
- Ensuring that strategies are followed.

An Area Command may become a Unified Area Command when incidents are multijurisdictional or involve multiple agencies.

An Area Command is organized similarly to an ICS structure but, because operations are conducted on-scene, there is no Operations Section in an Area Command. Other sections and functions are represented in an Area Command structure.

Crisis Management

A comprehensive crisis response plan strategically supports the execution of emergency response plans and procedures. It is not intended to subjugate those existing response plans or procedures that provide tactical guidance and are facility or asset specific. The focus of the crisis response plan should be on defining what constitutes a crisis for the organization and what is the correlating notification process and response to the crisis. Functional roles, as opposed to personal names or titles, should be clearly defined in the plan. The use of checklists and sample documents should be used liberally to ease tasks and provide guidance during the response.

A critical component of the overall crisis response program is adoption of an emergency management structure such as the ICS.

Consequence Management

"Crisis management" refers to measures to identify, acquire and plan the use of resources needed to anticipate, prevent, and/or resolve a threat or act of terrorism. The federal government exercises primary authority to prevent, pre-empt and terminate threats or acts of terrorism and to apprehend and prosecute the perpetrators; state and local governments provide assistance as required. Crisis management is predominantly a law enforcement response. "Consequence management" refers to measures to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses and individuals affected by the consequences of terrorism. State and local governments exercise primary authority to respond to the consequences of terrorism; the federal government provides assistance as required. Consequence management is generally a multifunction response coordinated by emergency management.

First-Arriving Unit/Incident Commander

1910.120(q)(3)(i) Procedures for Handling Emergency Response.

The senior emergency response official responding to an emergency shall become the individual in charge of a site-specific ICS. All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer.

Note to paragraph (q)(3)(i) — The "senior official" at an emergency response is the most senior official on the site who has the responsibility for controlling the operations at the site. Initially it is the senior officer on the first-due piece of responding emergency apparatus to arrive on the incident scene. As more senior officers arrive (i.e., Battalion Chief, fire chief, state law enforcement official, site coordinator, etc.), the position is passed up the line of authority which has been previously established.

Safety Officer Required

1910.120(q)(3)(vii).

The individual in charge of the ICS shall designate a Safety Officer, who is knowledgeable in the operations being implemented at the emergency response site, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

1910.120(q)(3)(viii).

When activities are judged by the Safety Officer to be immediately dangerous to life and health (IDLH) and/or to involve an imminent danger condition, the Safety Officer 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.

PLANNING PROCESS

Events tend to be easiest to prepare for. Planners can establish exactly what is required for the organization to accomplish and ensure that adequate resources are allotted to the effort. Agency administrators may provide these elements of information to the planners early in the process, or the process may be used to help identify these issues. Typically, when dealing with an event, more time is allotted for preparing and staffing the plan. The pressure on the planners is reduced and, therefore, plans and activities can be more detailed or specific.

Examples of the kinds of events that lend themselves to an ICS planning process include:

- Major field training exercises.
- A planned public event such as a major parade or concert.
- A planned public safety activity such as a law enforcement sweep, a major pest control effort, or a prescribed fire for wildfire fuel hazard reduction.

The information and other considerations used when planning for events include:

- Type of event (static or moving).
- Type of attendees (controlled or free access).
- Single or multiagency involvement.
- Single or multiple jurisdictions.
- Command and General Staff needs on the day of the event.
- Is the planning done for the organizing and preparation for the event or for actions to be taken in managing the event when it takes place?
- Kind, type and number of resources needed.
- Any aviation activities planned.
- Staging Areas required.

- Other event facilities needed.
- Logistical support for event managers.
- Known agency limitations or restrictions.
- Communication system needed.

With this information, the planners can develop an appropriate organizational structure to meet the needs of the event.

The second type of situation, and a more common one, is the unplanned incident. This type of situation is different from a planned event in several important ways. The situation occurs prior to the engagement of response personnel.

- Time is of the essence.
- The situation is unstable.
- The situation typically has the potential to expand rapidly.
- Communication and incident information may be incomplete.
- Staff on hand may vary in experience in managing expanding incidents.

This type of situation demands immediate planning and organizational actions to ensure safe and effective response activities. It often is overlooked that these incidents will present an ever-expanding list of variables and new considerations as long as the responders are reacting to the situation. Appropriate, effective planning actions are the only way to move to a proactive stance. Shortly after the arrival of Command personnel, the formal incident action planning process must be engaged to allow for the responders to accelerate in order to keep pace with the incident.

Beginning the process as described by the ICS will move any IC in the right direction. The balance of this unit describes the process of incident action planning within the ICS and also includes contingency and demobilization planning.

Operational Periods

An important concept to be discussed in regard to this planning process is the operational period concept. All ICS planning is designed around identifying accomplishments expected over a set period of time called the operational period. The specific length of time of the operational period varies, based on a list of factors:

- Safety conditions — safety of responders, victims and others is always the first priority on any response.

- Condition of resources — planning must be done far enough in advance to ensure that additional resources needed for the next operational period are available.

- The length of time necessary or available to achieve the tactical assignments.

- Availability of fresh resources.

- Future involvement of additional jurisdictions or agencies.

- Environmental conditions — factors such as the amount of daylight remaining and weather and wind conditions can affect decisions about the length of the operational period.

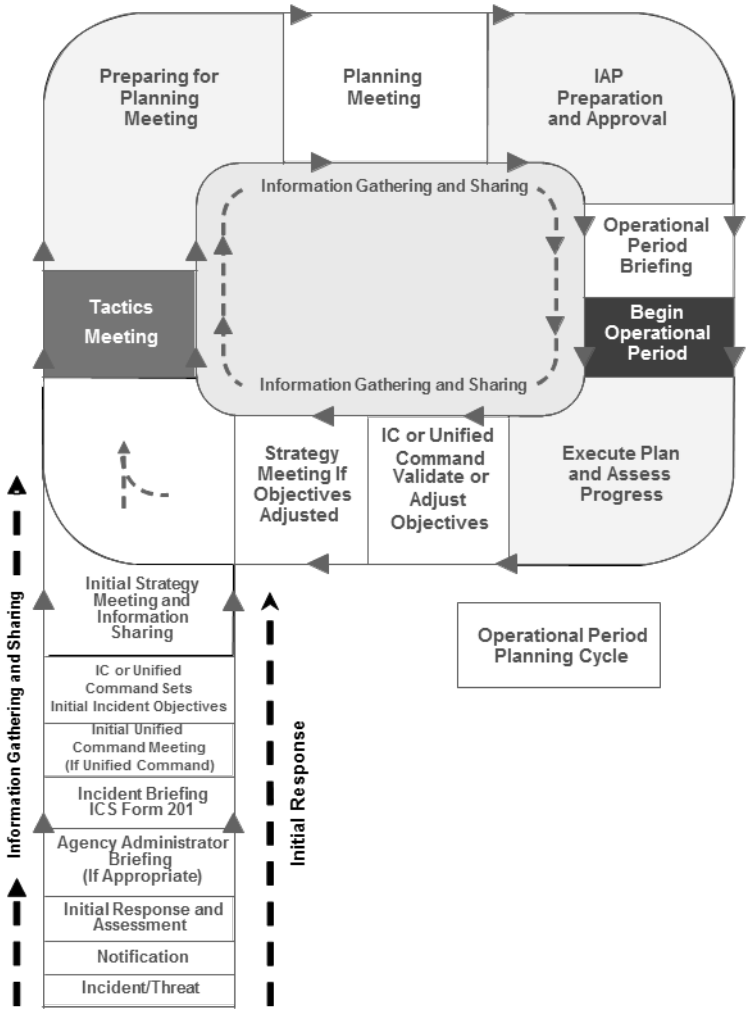
The IC will determine the length of the operational period with input from staff. In some cases, the operational period length may change from day to day based on operational and incident needs.

Common lengths of operational periods are four, eight, 12 or 24 hours, depending on the complexity of the incident. Sometimes the operational period may span into multiple days for relatively stable situations and recovery actions such as debris removal.

Often the start times and end times for the operational period are established during the initial Tactics Meeting. As an example, for 12-hour periods, it may be 0600 to 1800 hours. For some incidents, the starting time and duration of the operational period may have to be established at the Planning Meeting. There may be a need to integrate the results of the previous operational period fully before the next planning cycle can be established. This delay in establishing the operational period might be seen during the initial stages of an incident involving a hazmat release, where the results of the first entry might alter the approaches or need for subsequent entries. Later in the operations, multiple operational periods may be addressed within a single planning cycle and IAP.

The Planning "P"

The Planning "P"



The Planning "P" illustrates the incident planning process.

The leg of the "P" describes the initial response period. Once the incident/threat begins, the steps are Notification, Initial Response and Assessment, ICS Form 201, Incident Briefing, and Initial IC or Unified Command Meeting.

At the top of the leg of the "P" is the beginning of the first operational period planning cycle. In this circular sequence, the steps are IC or Unified Command Sets Objectives, Tactics Meeting, Preparing for the Planning Meeting, Planning Meeting, IAP Preparation and Approval, and Operations Briefing. At this point, a new operational period begins. The next step is Execute Plan and Assess Progress, after which the cycle begins anew with IC or Unified Command Sets Objectives, etc.

It is important to note that before each operational period begins, the incident objectives must be assessed and updated as needed. To achieve this, the incoming IC must meet with the initial response Command Staff and receive information regarding the status of the incident and the actions taken up to that point. Some of the vital information that the IC will want to obtain includes:

- Is the incident stable, or is it increasing in size and complexity?
- What are the current incident objectives, strategies, and tactics?
- Are there any safety issues?
- Are the objectives effective? Is a change of course needed?
- How long will it be until the current objectives are completed?
- What is the current status of resources? Are resources in good condition? Are there sufficient resources?

When the IC has gathered the above information and answered the above questions, the Command Staff can start to develop the incident objectives for the next operational period.

There is a relationship among incident objectives, strategies and tactics.

- **Incident objectives** state what is to be accomplished in the operational period.

- **Strategies** establish the general plan or direction for accomplishing the incident objectives.

- **Tactics** specify how the strategies will be executed.

Tactical direction describes what must be accomplished within the selected strategy or strategies in order to achieve the incident objectives. Tactical direction is the responsibility of the IC or the OSC, if that position has been assigned. The IC or the OSC gathers input from the Branch Directors and Division and/or Group Supervisors on alternative tactics. Gathering input is particularly important when the incident involves personnel from multiple disciplines. Jointly developed tactics can ensure understanding and enhance commitment.

Tactical direction consists of the following steps:

- **Establish Tactics:** Determine the tactics needed to implement the selected strategy. Typically, tactics are to be accomplished within an operational period. During more complex incidents, tactical direction should be stated in terms of accomplishments that can be achieved realistically within the timeframe currently being planned.

- **Assign Resources:** Determine and assign the kind and type of resources appropriate for the selected tactics. Resource assignments will consist of the kind, type, and numbers of resources available and needed to achieve the tactical operations desired for the operational period.

- **Monitor Performance:** Performance monitoring will determine if the tactics and resources selected for the various strategies are both valid and adequate.

An important component to developing an IAP is to determine what resources will be required to carry out the plan effectively. This is done in the Tactics Meeting and, once the tactics have been developed, an estimate of the needed resources that will be required for the next operational period can be developed. There is an ICS form that will assist in documenting the need: ICS Form 215, Operational Planning Worksheet. ICS Form 215 is a planning tool used to assist in establishing resource needs for an operational period, and it is also used to communicate the decisions made during the Planning Meeting concerning resource assignments to the Resources Unit. The Resources Unit uses the worksheet to complete Assignment Lists (ICS Form 204s); the LSC uses it for ordering resources for the incident.

ICS Form 215 is initiated prior to the Planning Meeting by the IC or the OSC who uses the worksheet to plan resource requirements for the next operational period. Additionally, it is used as a display during the Planning Meeting where it is finalized based on contributions from the Command and General Staff. ICS Form 215G is generic, and ICS Form 215W is preprinted with kinds and types of wildland fire resources listed. ICS Form 215 provides information on:

- Incident work location.
- Work assignments.
- Kind and type of resources needed.
- Current availability of incident resources.
- Reporting location.
- Requested arrival time for additional resources.

Although ICS Form 215 is not required to be part of the IAP, it is very effective on larger incidents, and in the larger incidents it always should be used to determine what tactical resources are needed.

ICS Form 215 can show graphically that span of control is within guidelines or has been exceeded, as well as quickly help to identify surplus resources that may be released. Some agencies that regularly use ICS Form 215 have prepared it in a larger format on various sizes of whiteboard. This makes the worksheet visible to a larger audience at Planning Meetings.

Resource Ordering

ICS Form 215 indicates the kind and type of resources needed to implement the recommended tactics to meet the incident objectives. The number of resources on-site, ordered and needed is indicated. It is designed to help link incident objectives and resources needs. If a less formal planning process is used, the IC still should ensure that resource needs are based on incident objectives.

Resource managers use various resource inventory systems to assess the availability of assets provided by public, private and volunteer organizations. Preparedness organizations enter all resources available for deployment into resource tracking systems maintained at local, state, regional and national levels. The data then are made available to dispatch/ordering centers, EOCs, and multiagency coordination entities.

Knowing the specific capabilities of the various kinds of resources helps planners decide the kind, type and quantity of resource best suited to perform activities required by the IAP. Ordering resources by type saves time, minimizes error, gives a clear indication of exactly what is needed, and reduces nonessential communications between the incident and the off-site order point. Knowing the type of tactical resources assigned enables managers to monitor for under- or over-capability, and to make changes accordingly. Careful monitoring of resource performance can lead to the use of smaller or less costly resources, which can result in increased work performance and reduced cost.

NIMS is based on the need for standard definitions and practices. NIMS has a national typing system that will provide responders with common definitions when ordering or receiving assets through mutual aid. Systems that do not conform to these common definitions are not compliant with NIMS.

To ensure that responders get the right personnel and equipment, ICS resources are categorized by the kind and type of resource.

- **Kinds of resources:** Describe what the resource is (for example: engines, water tenders, Incident Management Teams (IMTs)).

- **Types of resources:** Describe the size, capability and staffing qualifications of a specific kind of resource.

Another important consideration when ordering resources is considering the impact that safety procedures and requirements will have on the amount and type of resources. The ICS Form 215A, Incident Action Plan Safety Analysis is used to identify, prioritize, and mitigate the hazards and risks of each incident work location by operational period.

When the Safety Officer reviews the proposed tactics, assignments and number of resources required to complete the incident objectives, he or she then documents the safety analysis on ICS Form 215A. It will identify hazardous tactics so that alternatives may be considered, as well as determine the safety implications for the types of resources required. The Incident Action Plan Safety Analysis also may reveal that the proposed tactic is too hazardous to attempt and another tactic must be developed. Both the completed ICS Forms 215 and 215A are displayed during the Planning Meeting.

Transfer/Pass Command

Transfer of Command: The process of moving the responsibility for Incident Command from one IC to another is called “transfer of Command.” It should be recognized that transition of Command on an expanding incident is to be expected. It does not reflect on the competency of the current IC.

Command is transferred to improve the quality of the Command organization. The following information outlines a sample transfer of Command process. The transfer of Command procedures/guidelines must be predetermined by individual agencies for their use.

The fact that a higher ranking person has arrived on the scene does not necessarily mean that he or she is prepared to assume Command of the incident. The person may or may not have knowledge of previous orders or a grasp of the current situation. Without a thorough briefing of the situation status, the officer may compromise incident operations.

It is essential that SOPs/standard operating guidelines (SOGs) for the transfer of Command to a qualified person be developed and practiced within the organization. It is important to remember that Command is transferred in both directions, up as the incident escalates and down during the demobilization phase.

The best method of transferring Command is through a face-to-face meeting between the initial IC and the subsequent IC. In face-to-face conversation the relieving IC is able to take full advantage of all communication mediums. Communication is more than just words; the pitch of the voice, facial expressions, hand gestures, and other body language assist greatly in conveying necessary information. The officer being relieved also can "read" the receiver's body language, helping him or her to see whether or not the message is understood.

The person being relieved of Command should review the tactical worksheet with the officer assuming Command (sample Tactical Worksheet is in the appendix). This sheet provides the most effective framework for transfer of Command because, properly used, it outlines the location and status of personnel and resources. The person being relieved then should be reassigned to the best advantage of the officer assuming Command. Remember, as the relieving IC you are at a disadvantage. You probably have not been on the scene long, some actions have taken place prior to your arrival, other actions have yet to take place, and you are in a catch-up mode. The information that you receive and retain is critical to your knowledge of the situation and the success of the next operational phase.

The second best method of transferring Command is by radio. However, because this is only spoken communication, radio transfer often leaves the relieving commander with information gaps and extends the time needed to "catch up" to the incident. Information gaps can lead to poor initial decisions and affect firefighter safety.

The least desirable is a Command change without an information exchange. Use this method only when other methods cannot be used. The new commander usually is at such an informational disadvantage that "catch-up" time is significantly extended.

As previously stated, it is critical that a briefing takes place when Command is transferred. Such a briefing should include, at a minimum, the following information:

- Incident status/conditions (rescue situations, injuries, hazards, etc.).
- An IAP (strategies and tactics being employed).
- Progress toward achieving incident objectives.
- Safety considerations and concerns.
- Conduct personnel accountability roll call.
- Assignment/deployment of companies and personnel operating on the incident.

Projection of incident condition and additional resource needs.

Passing Command: The initial IC has three options of personal involvement at the incident:

1. IC.

2. Combat — hands-on.

3. Tactically involved commander.

Select the IC role when there are sufficient personnel to accomplish the initial high-priority tasks or when the initial officer's involvement will not resolve a critical incident priority. Two examples of the latter are a well-involved structure fire needing numerous hoselines to bring control, and no life hazards present, or a fire in a nursing home where 50 trapped persons may perish. In both of these examples, it is likely that the first-in officer's involvement in tactical operations will not affect the outcome significantly. Will the addition of the officer and a small amount of water extinguish the structure fire? Probably not. How many of the 50 lives can be saved by the addition of one additional person in the combat role? These types of incidents require immediate Command.

Choose the combat role when the first-in officer's environment will resolve a critical incident priority, for example, a room-and-contents fire in a dwelling that can be extinguished with one hoseline. Only one firefighter is available to enter the structure with the hoseline. In this case, the first-in officer should assist the firefighter in advancing the hoseline into the dwelling and extinguishing the fire. When in the combat role, the first-in officer may pass Command to the officer on the next-arriving unit.

Passing Command is a process that alerts the next arriving officer to be in the "order-giving" mode rather that the "order-receiving" mode immediately on arrival. This is an important alert. Instead of receiving an assignment, he or she will be coordinating tactical applications, scene safety, and a number of other mentally intensive tasks.

A unit not yet on the scene should be advised that they will assume Command on arrival. This allows the other unit leader time to change roles and get into the "order-giving" mode (a primary reason for "passing Command" in the first place). However, Command should not be assumed by the new IC until he or she is on the scene and declares so via radio, and contacts the first-in officer who passed Command. It is also recognized by most authorities that one cannot manage an incident until one is on the scene and one should, therefore, not be accountable until then.

In addition, Command should only be passed one time (except under extraordinary conditions); otherwise free-enterprise firefighting may result, as Command is passed from one unit to the next based on their arrival sequence. It is imperative that this, as well as the other parameters of passing/transfer of Command, is clearly stated in a department policy and that all personnel are familiar with that policy.

There are five important steps in effectively assuming command of an incident in progress.

Step 1: The incoming IC should, if at all possible, personally perform an assessment of the incident situation with the existing IC.

Step 2: The incoming IC must be adequately briefed. This briefing must be by the current IC, and take place face-to-face if possible. The briefing must cover the following:

- Incident history (what has happened).
- Priorities and objectives.
- Current plan.
- Resource assignments.
- Incident organization.
- Resources ordered/needed.
- Facilities established.
- Status of communications.
- Any constraints or limitations.
- Incident potential.
- Delegation of authority.

ICS Form 201 is especially designed to assist in incident briefings. It should be used whenever possible because it provides a written record of the incident as of the time prepared. ICS Form 201 contains:

- Incident objectives.
- A place for a sketch map.
- Summary of current actions.
- Organizational framework.
- Resources summary.

Step 3: After the incident briefing, the incoming IC should determine an appropriate time for transfer of Command.

Step 4: At the appropriate time, notice of a change in Incident Command should be made to:

- Agency headquarters (through dispatch).
- General Staff members (if designated).
- Command Staff members (if designated).
- All incident personnel.

Step 5: The incoming IC may give the previous IC another assignment on the incident. There are several advantages of this:

- The initial IC retains first-hand knowledge at the incident site.
- This strategy allows the initial IC to observe the progress of the incident and to gain experience.

Resource Management

NIMS defines standardized mechanisms and establishes requirements for processes to describe, inventory, mobilize, dispatch, track and recover resources over the life cycle of an incident. Included in this initiative is the "typing" of resources, e.g., Type 1 helicopter, Type 2 Engine, etc. A link to the definitions of typed resources can be found at http://www.fema.gov/nims.

Under NIMS, a standard, automated resource management system will define the process for localities and states to request resources from other jurisdictions when needed for disasters. This system also will define the process for notification, dispatch, mobilization and travel of these resources to the incident scene where work assignments are made.

Resource Management System

Resource request:

- The need for the resource is identified by Command.
- The resource is requested through the incident communication process — most likely to the appropriate ESF in the local EOC.
- If the resource is not available in Staging, then the request goes to the next step.

Resource ordering/tasking:

- The local EOC orders the resource from the state EOC.
- The state EOC locates the resource, e.g., in-state (through regional response plans) or interstate (through Emergency Management Assistance Compact (EMAC), an interstate mutual-aid plan).
- An order number is assigned to the resource, and a specific assignment (task) is defined to be performed by the resource.

Dispatch:

- The tasked resource is dispatched by the authority having jurisdiction (AHJ) to the incident site.
- The individual components of the resource are mobilized for travel to the incident; travel may be via over-the-road transport or air transport.
- The departure point is where (resource and personnel) accountability really kicks in.
- The resource arrives at the incident base or Staging Area (as identified in the mobilization order), where it is checked in on the incident (continuing accountability) and incident work assignment(s) is/are made.

Accountability is maintained throughout the resource's operations on the incident as well as through the demobilization process, and on return to home base/agency.

Resources

- Responder/Team type.

  - On-scene.
  - Training.
  - Mutual aid.
  - Team response.
  - Specialty.
  - Response time to scene.
  - Entry/Defensive.

- Physical type.

  - Apparatus.
  - Equipment.
  - Specialty (foam, agents, detection).
  - Response time to scene.
  - Preplan mutual agreements.
  - Replacement/Restocking.

- Financial type.

  - Scene documentation methods for reimbursement.
  - Open purchase orders.
  - Standardize charging fees.
    - -- Personnel.
    - -- Equipment.
    - -- Hazmat teams.
  - Scene reimbursement costs.

Hazmat Group Responsibility

Tactical operations outside the controlled zones, and many other related functions, are managed by the regular ICS positions. The Hazmat Group manages tactical operations carried out inside the control zones. These operations include site safety, rescue, containment and confinement operations, decontamination, medical monitoring, and sample taking.

Efforts of the various technical specialists need coordination through the hazardous materials/ weapons of mass destruction (Hazmat/WMD) Group Supervisor/Branch Director. These technical specialists include reference specialists, science specialists, and weather specialists.

It is recommended and highly desirable for Hazmat/WMD Group Supervisors/Branch Directors to receive training to the technician level.

A checklist of activities of the Hazmat/WMD Group Supervisors/Branch Directors includes the following:

- Check in and obtain briefing from the OSC or Hazmat/WMD Branch Director (if activated).
- Develop control zones and access control points and oversee placement of appropriate control lines.
- Evaluate and recommend public protection action options to the OSC or Branch Director (if activated).
- Obtain current weather data and future weather predictions.
- Establish environmental monitoring of the hazard site for contaminants.
- Develop and implement a Site Safety Plan.
- Conduct safety meetings with the Hazmat/WMD Group.
- Participate, when requested, in the development of the IAP.
- Ensure that responders follow recommended safe operational procedures.
- Ensure that responders select and use the proper personal protective equipment (PPE).
- Notify the appropriate agencies through the IC.
- Maintain ICS Form 214.

Entry Leader

The Entry Leader reports to the Hazmat/WMD Group Supervisor and is responsible for the overall entry operations of assigned personnel and directs any rescue operations within the Exclusion Zone.

A checklist of activities for the Entry Leader includes:

- Check in and obtain briefing from the Hazmat/WMD Group Supervisor.
- Supervise entry operations.
- Recommend actions to mitigate the situation within the Exclusion Zone.
- Carry out actions, as directed by the Hazmat/WMD Group Supervisor, to mitigate the hazmat/WMD release or threatened release.
- Maintain communications and coordinate operations with the Decontamination Leader.
- Maintain communications and coordinate operations with the Site Access Control Leader and the Safe Refuge Area Manager (if activated).
- Maintain communications and coordinate operations with technical specialist/hazmat reference.
- Maintain control of the movement of people and equipment within the Hot Zone, including contaminated victims.
- Direct rescue operations, as needed, in the Hot Zone.
- Maintain ICS Form 214.

Decontamination Leader

The Decontamination Leader also reports to the Hazmat/WMD Group Supervisor and is responsible for all operations and personnel inside the Contamination Reduction Zone (CRZ) (decontamination corridor). Decontamination requirements and guidelines are in the IAP.

A checklist of activities of the Decontamination Leader includes:

- Check in and obtain briefing from the Hazmat/WMD Group Supervisor.
- Establish the CRZ (decontamination corridor).
- Identify contaminated people and equipment.
- Supervise the operations of the Decontamination Crew in the process of decontaminating people and equipment.
- Maintain control of movement of people and equipment within the CRZ.
- Maintain communications and coordinate operations with the Entry Leader.
- Maintain communications and coordinate operations with the Site Access Control Leader and the Safe Refuge Area Manager (if activated).
- Coordinate the transfer of contaminated patients requiring medical attention (after decontamination) to the Medical Group.
- Coordinate handling, storage and transfer of contaminants within the Warm Zone.
- Maintain ICS Form 214.

Site Access Control Leader

The Site Access Control Leader also reports to the Hazmat/WMD Group Supervisor and is responsible for the control of movement of all personnel and equipment through appropriate routes and corridors at the hazmat incident site. Further, this person ensures the control of contaminants and the keeping of records.

A checklist of activities of the Site Access Control Leader includes:

- Check in and obtain briefing from the Hazmat/WMD Group Supervisor.
- Organize and supervise assigned personnel to control access to the hazard site.
- Oversee the placement of control lines.
- Ensure that appropriate action occurs to prevent the spread of contamination.
- Establish the Safe Refuge Area in the Hot Zone adjacent to the Warm Zone.
- Appoint a Safe Refuge Area Manager (as needed).
- Ensure the decontamination of injured or exposed individuals prior to departure from the hazard site.
- Ensure long-term observations of people being decontaminated.
- Coordinate with the Medical Group for proper separation and tracking of potentially contaminated individuals needing medical attention.
- Maintain observations of any changes in climatic conditions or other circumstances external to the hazard site.

- Maintain communications and coordinate operations with the Entry Leader.
- Maintain communications and coordinate operations with the Decontamination Leader.
- Maintain ICS Form 214.

Safe Refuge Area Manager

The Safe Refuge Area Manager reports to the Site Access Control Leader and is responsible for evaluating and determining the priority of victims for treatment, collecting information from the victims, and preventing the spread of contamination by the victims. The manager coordinates activities with the Decontamination and Entry Leaders. The Safe Refuge Area should be at the interface of the Hot and Warm Zones, near the CRZ.

A checklist of activities of the Safe Refuge Area Manager includes:

- Check in and obtain briefing from the Site Access Control Leader.
- Establish the Safe Refuge Area at the interface of the Hot and Warm Zones, adjacent to the CRZ and the Exclusion Control Line.
- Monitor the hazmat release to ensure that the Safe Refuge Area is not subject to exposure.
- Assist the Site Access Control Leader by ensuring the evaluation of victims for contamination.
- Manage the Safe Refuge Area for holding and evaluating victims who may have information about the incident, or who are suspected of being contaminated.
- Maintain communications with the Entry Leader to coordinate the movement of victims from the Refuge Area(s) in the Exclusion (Hot) Zone to the Safe Refuge Area.
- Maintain communications with the Decontamination Leader to coordinate the movement of victims from the Safe Refuge Area into the CRZ, if needed.
- Maintain ICS Form 214.

Technical Specialist/Hazmat/Weapons of Mass Destruction Reference

The technical specialist/hazmat/WMD reference reports to the PSC, but may work under the Hazmat/WMD Group Supervisor. The technical specialist/hazmat/WMD reference provides technical information and assistance to the Hazmat/WMD Group using various reference sources. These sources include facility representatives, technical references, computer databases, and the Chemical Transportation Emergency Center (CHEMTREC). The specialist provides product identification methods to either categorize or identify unknown materials.

A checklist of activities of the technical specialist/hazmat/WMD reference includes:

- Obtain briefing from the PSC.
- Check in and obtain briefing from the Hazmat/WMD Group Supervisor.
- Provide technical support to the Hazmat/WMD Group Supervisor.
- Maintain communications and coordinate operations with the Entry Leader.

- Provide and interpret environmental monitoring information.
- Provide analysis of hazmat/WMD samples.
- Determine compatibility of PPE to hazmat/WMD.
- Provide technical information of the incident for documentation.
- Provide technical information management with public and private agencies, such as Poison Control Center, Tox Center, CHEMTREC, State Department of Food and Agriculture, National Response Team.
- Assist PSC with projecting the potential environmental effects of the release.
- Maintain ICS Form 214.

Safety Officer or Assistant Safety Officer/Hazmat/Weapons of Mass Destruction

The Assistant Safety Officer/Hazmat/WMD, when appointed, must be present during all operations at the incident or until relieved properly by the IC Staff Safety Officer. The Assistant Safety Officer/Hazmat/WMD reports to the Incident Safety Officer and coordinates with the Hazmat/WMD Group Supervisor (or Hazmat/WMD Branch Director if activated).

The Assistant Safety Officer coordinates safety-related activities that have a direct effect on the Hazmat/WMD Group operations. Additionally, the Assistant Safety Officer/Hazmat/WMD advises the Hazmat/WMD Group Supervisor on all aspects of health and safety and has the authority to stop or prevent unsafe acts in IDLH conditions (29 CFR 1910.120(q)(3)(viii)). In a multiactivity incident, the Assistant Safety Officer/Hazmat/WMD should not act as the Safety Officer for the overall incident.

A checklist of activities of the Assistant Safety Officer/Hazmat/WMD includes:

- Check in and obtain briefing from the Incident Safety Officer.
- Obtain briefing from the Hazmat/WMD Group Supervisor.
- Participate in the preparation and implementation of the Site Safety Plan.
- Advise the Hazmat/WMD Group Supervisor of deviations from the Site Safety Plan or any dangerous situations.
- Alter, suspend or terminate any activity that may be judged to be unsafe in IDLH areas.
- Ensure the protection of the Hazmat/WMD Group personnel from physical, environmental and chemical hazards/exposures.
- Ensure that EMS are on-site.
- Coordinate with the Medical Unit Leader.
- Maintain current medical records for the Hazmat/WMD Group personnel.
- Maintain ICS Form 214.

Incident Scene Accountability

All officers holding positions within the Command organization are responsible for the welfare and accurate accountability of all assigned firefighters. Several fire departments around the

country have developed fireground accountability systems. While all may vary in overall design, there are common elements that fire departments should apply at emergency incidents to fully account for their personnel. These common elements are:

- Required use.
- Hardware nametags/documentation.
- Point-of-entry control of nametags.
- Accountability officers.
- Benchmarks for required roll calls throughout operations.
- Plans for describing the Command organization response to reports of lost firefighters.
- Use of Rapid Intervention Crews (RICs).

Whatever the design, the system must be able to identify the location of every firefighter within a small geographic work area within the hazard zone at any moment in time. Further, the system must be able to determine if a firefighter is delayed from an assignment, cause initiation of an immediate rescue effort if indicated, and must be able to fully integrate into the ICS.

All fire departments are strongly encouraged to develop and implement a workable accountability system. The final product should be compatible with other metro-area or regional accountability systems.

Rapid Intervention Crew/Rapid Intervention Team

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program* requires having specifically designated rescue crews at the incident scene. This requirement is based on the realization that firefighters face the highest risk of injury or death while operating an emergency scene, and that one of the most effective mechanisms for reducing that risk is to have a crew ready to assist other emergency personnel should the need arise.

It should always be a primary concern to reduce the risks to firefighters during emergency operations. It is not realistic, however, to assume that all risks can be avoided, controlled or eliminated from this environment. Danger is part of the work environment and the possibility that things can go wrong is real. Recognizing this possibility, responders must make some provisions to assist colleagues who find themselves in trouble.

It is an important aspect of incident management to identify the risk characteristics of the situation and to evaluate specific risk factors that apply to each activity. A situation involving a high level of risk requires a greater commitment to rapid intervention for the rescue of emergency personnel should something go wrong. An interior fire in a small, single-story building presents a certain level of risk to the firefighters who enter to search for occupants and to extinguish the fire. While a situation may appear to be “routine,” there are still things that could go wrong and place firefighters in imminent danger. A flashover could envelop them in flames, a structural collapse could trap them, or a faulty SCBA could cause a firefighter to run out of breathable air. In a small, single-story occupancy, the chances are fair that firefighters

could extricate themselves from most situations if they are within a short distance from an exit that leads directly to the exterior.

The same fire situation in a large building, in a basement or an upper floor, in the hold of a ship, or in a high-rise building presents much greater danger. In these areas, the distance responders would have to travel to reach a safe area and the difficulties they might encounter along the way complicate the ability of individuals to rescue themselves.

The risk also may increase from the nature of the task in which they were involved. Rescuing an unconscious worker from a confined space that is filled with toxic and flammable vapor is much more dangerous to the rescuers than removing an unconscious person from a wrecked automobile on a city street. Both situations involve a degree of risk to the rescuers, but the nature and degree of the risks are very different.

The composition and placement of RICs may be somewhat agency-specific, dictated by individual needs and resource ability. However, it is important that written procedures or guidelines exist for the use of these crews, especially when they are performing exterior operations in support of interior crews. These written procedures also should include evacuation signals and guidelines for implementing evacuation and relocation of personnel from the area of danger. In addition, for agencies involved in automatic mutual-aid response it is important to develop consistency among the participating agencies in the use of RICs.

An RIC should consist, at a minimum, of two members, fully equipped with appropriate clothing, SCBAs, portable radios, and necessary tools to be effective. The crew also should monitor the tactical radio channel to maintain a complete and accurate understanding of operations and changing conditions as well as location of tactical personnel. A member of the RIC should record this information on a Tactical Worksheet. In the early stages of an incident, RIC personnel may perform other functions, e.g., secure utilities, flake-out hoselines, work in the CP. However, they must remain prepared to redeploy to perform rapid intervention functions. As the incident expands in size or complexity, personnel should be assigned as a dedicated RIC. Placement of the RIC may be dependent on the incident, for example in a high-rise operation, the RIC should be located in Staging (two floors below the fire). In many other situations, a good location would be near the CP or in proximity of Operations. They should not be located in a position that would interfere with the CP operations. If the incident covers a large geographic area, more than one RIC may be required.

In a hazmat operation, the Entry Team Leader must ensure that there is an RIC of at least two personnel in the appropriate level of protection before the primary Entry Team accesses the Hot Zone. In a hazmat operation, this team is designated as the “Backup” Team. The personnel of the Backup Team need to have the same level of required technical competency as the Entry Team. This includes the appropriate level of protection required for the material(s) involved.

There is some flexibility in procedural issues regarding rapid intervention. But it is paramount that at least one properly-attired RIC is available to provide assistance or rescue whenever personnel are operating in positions or performing functions that would subject them to immediate danger in case of equipment failure or other unexpected sudden events.

Rapid intervention procedures differ from initial interior structural firefighting operations addressed in NFPA 1500. NFPA 1500 requires the assembly of four personnel before beginning interior structural firefighting operations. Two of those members may operate in the hazardous atmosphere while the other two members are the rescue team outside the hazardous atmosphere. The exception to this is that if there is an immediate life-safety situation, rescue may be initiated. However, members should evaluate carefully the level of risk that they would be exposed to by taking such actions. If it is determined that the situation warrants such action, incoming companies should be notified so that they will be prepared to provide necessary support and backup upon their arrival. When waiting to be deployed, members of the RIC may be assigned to other tasks, e.g., pump operator, initial IC, as long as these other activities do not interfere with their ability to respond as an RIC.

ICS Forms versus Tactical Worksheet

Tactical Worksheets

- The value of a worksheet.

  - It's vital for any IC to be able to quickly size up an incident, develop a strategy (either offensive or defensive), and develop an IAP. These key early decisions will determine the outcome of the incident, as well as firefighter safety, communications and incident organization overall.

  - The Tactical Worksheet is a critical piece of equipment because it helps the IC organize these and other tasks by providing reminders, prompts and a convenient workspace for tracking companies, apparatus and resources.

  - It allows the IC to slow down during what could be a large, multialarm incident and record vital information that may be helpful in making future operational decisions.

  - By documenting the assignments, Division/Group officers, and Division/Group resources, the IC creates a visual reference of the overall incident organization and deployment.

  - The worksheet is also an excellent tool for passing Command.

  - For the new IC, the Tactical Worksheet can be of great assistance in maintaining focus and providing comfort in his or her role as commander. The ability to maintain a focal point as the incident grows is critical for a successful outcome.

- The advantages of using a Tactical Worksheet.

  - Includes a location to quickly note individual assignments.
  - Provides prompts for the IC, such as time, air management and strategy prompts.
  - Provides tactical benchmarks, such as "All Clear," "Fire Control" and "Loss Stopped."

- Facilitates consistent, organized information.
- Documents assignments and responsibilities.
- Expedites passing of Command or support for the IC.
- Provides resource status.

INCIDENT COMMAND SYSTEM DOCUMENTATION

Forms

Several management tools are available to the IC and incident personnel. The report forms listed on the following pages are available to the IC as potential incident management tools. A brief description of the standard ICS forms and their uses follow. Forms that are unique to participating agencies at the incident are not included in this section, but are important to the process of documenting the incident activities. Agency-specific forms should be part of all final documentation.

Government agencies may require After-Action Reports in some form or other. These reports may serve for internal review, statistical analyses, determination of training and equipment needs, determination of compliance, and enforcement. Therefore, incident forms and records completed by ICS personnel during the incident should be available for reference after the incident is demobilized. The Documentation Unit is responsible for collecting and filing this information about the incident.

The Documentation Unit is responsible for maintaining all the completed forms prepared during the incident. Copies of each form must go to the appropriate staff (IC, Safety Officer, OSC, etc.) during the incident, but the Documentation Unit must maintain the final completed copies as the official record of activity at the incident. The Unit Leader also may request copies of any records or reports needed to maintain a complete file.

For an incident involving only a single jurisdiction, the responsible agency will complete, maintain, and store all incident documents and files according to agency policy and procedures. For incidents involving more than one jurisdiction (which is common in many hazmat incidents) the jurisdiction where the release takes place should complete, maintain, and store all incident documents and files according to its policies and procedures. The concurrence of agencies participating in the response is required before destroying any incident files.

Completed forms help during post-incident analysis, critique, exposure documentation, hazard communication, and many other situations. The documentation created on the incident may become evidence in legal actions pertaining to the incident. The ICs are responsible for completion and safekeeping of these records. One may have difficulty proving actions if one does not have written record of those actions. The job is not complete until the paperwork is in!

Now we will examine some forms and records that are routinely used in the ICS during planning activities and actual operations.

ICS Form 201, Incident Briefing

This form provides the IC (and the Command and General Staff assuming Command of the incident) with basic information on the incident and the resources allocated to the incident. It also serves as a permanent record of the initial response to the incident.

Preparing ICS Form 201 is the job of the initial-attack IC for presentation to the relieving senior officer. This form can serve as an outline for a more detailed oral briefing during transfer of Command.

ICS Form 201 is a multipage document. Page 1 is a map sketch of the site showing geographical landmarks, resource locations, and wind direction. Page 2 is a summary of current actions. Page 3 shows the current organizational chart, listing individuals assigned to each management position at the incident. Page 4 is a resource summary, listing important information about resources assigned to the incident.

INCIDENT GOALS, OBJECTIVES, STRATEGIES AND TACTICS

Operational responsibilities of Command include three levels.

1. Incident objectives:

    - Isolation.
    - Notification.
    - Identification.
    - Protection.
    - Control.
    - Recovery.
    - Termination.

2. Strategies.

3. Tactics.

The strategic level is a function of the IC. The IC sets the overall plan and priorities.

The tactical level is a function of the OSC. This person selects the tactics and prioritizes the assignments. When an Operations Chief has not been designated, the IC must perform tactical level responsibilities.

When the Planning Section is established, the strategic and tactical levels of the operation should become part of the information given to the PSC. This is vital information since the primary function of this section is evaluating the incident and forecasting incident needs. The PSC also must develop alternative plans that include both strategic and tactical level information.

The task level is a responsibility of the supervisors and emergency responders who are performing the individual tasks that achieve the tactical objectives.

Writing SMART objectives. Acronym for:

- **Specific** — the wording must be precise and unambiguous in describing the objective.
- **Measurable** — the design and statement of objectives should make it possible to conduct a final accounting as to whether objectives were achieved.
- **Achievable** — the objective must have an action word that describes the expected accomplishments.
- **Realistic** — objectives must be achievable with the resources that the agency (and assisting agencies) can allocate to the incident, even though it may take several operational periods to accomplish them.
- **Timeframed** — the timeframe should be specified.

Incident Action Plan

The IAP actually consists of several ICS forms bundled together that document the actions developed by the IC and Command and General Staff or others during the Planning Meeting. When all attachments are included, the plan specifies the incident objectives, strategies and tactics, resources, personnel organization, communications plan, medical plan, and other appropriate information — for use in Operations.

An IAP update must follow each formal Planning Meeting conducted by the PSC and the Command and General Staff. The IC approves it prior to distribution. An IAP is a must for each operational period beyond the initial action phase.

The table that follows summarizes the most important forms related to the IAP.

Here is a list of ICS forms that make up an effective IAP:

- ICS Form 201, Incident Briefing (sketch of site) (page 1).
- ICS Form 202, Incident Objectives.
- ICS Form 203, Organization Assignment List.
- ICS Form 204, Assignment List.
- ICS Form 205, Incident Radio Communications Plan.
- Traffic Plan (internal and external to the incident).
- ICS Form 206, Medical Plan.

ICS Form 202 is the cover page of an IAP. This form describes the basic strategic goals and tactical objectives and provides weather information and safety considerations for use during the next operational period.

ICS Form 203 provides ICS personnel with information on the units that are activated currently and the personnel staffing each position or Unit.

ICS Form 204 informs Operations Section personnel of incident assignments. Once the IC and General Staff have agreed to the assignments, the assignment information is given to the appropriate Units and Divisions/Groups during the briefing meeting prior to the next operational period. The Resource Unit normally prepares this form.

ICS Form 205 provides a single source of information on all radio frequency assignments for each operational period. The Communications Unit Leader prepares this plan.

ICS Form 206 provides information on incident medical aid stations, transportation services, hospitals, and medical emergency procedures. The Medical Unit Leader prepares ICS Form 206 and the Safety Officer reviews it. Section 29 CFR 1910.120(q) requires this.

All of the forms listed are available as standard ICS forms and have varying degrees of importance to the documentation of incident actions. One form that all Unit leaders and incident staff must use is **ICS Form 214**. This form records details of the Unit activity, including team-level activities. The file that is made up of these logs provides a basic reference from which to extract information for inclusion in any After-Action Report.

The Command Staff members, Division/Group Supervisors, Air Operations Groups, Strike Team/Task Force Leaders, and Unit Leaders initiate and maintain this form. A unit log is needed for each operational period. Completed unit logs go to supervisors who then transmit the logs to the Documentation Unit. The log should note the time and brief description of each significant occurrence or event in which the Unit was involved or by which it was affected (injuries, assignments, task completions, difficulties encountered, etc.).

ICS Form Matrix

Name and Number	Purpose	Originator	Required Approval	Distribution
201, Incident Briefing	Gives IC basic information like incident situation, resources and initial response.	Initial attack IC	None	Situation and Resource Units and Document Unit
202, Incident Objectives	Specifies control objectives, including alternatives and specific precautions to be observed. It is the cover sheet for the IAP. A weather forecast is provided.	PSC	IC	All Section, Branch, Division, Group, and Unit Leaders and Documentation Unit
203, Organization Assignment List	Provides ICS positions activated and names of personnel staffing positions.	Resource Unit	None	All Section, Branch, Division, Group, and Unit Leaders and Documentation Unit
204, Assignment List	Keeps Operations personnel current on incident assignments.	Operations Chief and Resource Unit	PSC	All Section, Branch, Division, Group, and Unit Leaders and Documentation Unit
205, Incident Radio Communications Plan	Provides information on all radio frequency assignments. These are placed on the Division Assignment List (ICS Form 204).	Communications Unit Leader	None	All Section, Branch, Division, Group, and Unit Leaders and Documentation Unit
206, Medical Plan	Lists information on medical-aid stations, transportation services, hospitals, and medical emergency procedures.	Medical Unit Leader	Safety Officer	All Section, Branch, Division, Group, and Unit Leaders and Documentation Unit
208HM, Site Safety and Control Plan	Provides documentation of hazmat response personnel, operations and safety.	Hazmat Group Supervisor or Safety Officer	IC Hazmat Group Supervisor Assistant Safety Officer-Hazmat	
214, Unit/Activity Log	Records details of Unit activity. Used as a reference to extract information for the After-Action Report.	Section Chiefs, Branch Directors, Division or Group Supervisors, Unit and Strike Team Leaders	None	Submit to immediate supervisor for transmittal to Documentation Unit
221, Demobilization Checkout	Provides documentation on resources released, equipment, supplies returned, and financial records.	Demobilization Unit	None	Submit to Demobilization Unit upon completion

When an incident engages only a few Units, the IAP lives in the mind of the IC. The IAP includes the strategy and tactics for the incident as well as the needed supporting operations. The IC must ensure that operating resources and managers know the overall strategy. Orders issued to arriving companies and other officers normally convey this information.

On large, complex incidents of long duration, it is mandatory that the IAP take a written form. Naturally, the initial IAP is in the mind of the IC until sufficient staff arrives to create an overall plan and commit it to writing. It is highly advantageous on these types of incidents to have a Planning Meeting headed by the PSC. All of the Command and General Staff as well as others designated by the IC should attend the Planning Meeting. The plan is developed for the next operational period with input from the attendees and placed in writing. All of the attendees leave the meeting with an understanding of the incident objectives and strategies that are to be accomplished.

Additional Planning Meetings occur on a frequency that meets the needs of the incident. Modifications to the plan follow and all personnel needing them receive a copy.

SUMMARY

Common sense dictates the use of an ICS at hazmat incidents, just as one would at other responses. OSHA 29 CFR 1910.120 requires it, and NFPA recommends it. The ICS information presented will help increase incident safety and efficiency and at the same time help meet national standards and regulations as well as the requirements of NIMS.

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ACTIVITIES

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Activity 2.1

Fourteen Essential Elements of ICS

Purpose

To conduct a self-review of your knowledge of ICS.

Directions

1. You will be divided into four groups.

2. The instructor will assign each group three or four of the 14 essential elements.

3. You will have 15 minutes to review your assigned elements and identify how each element produced positive or negative outcomes.

4. Discuss the elements to prepare for a class presentation on your assigned elements. You should share personal experiences/examples. You will have 20 minutes for discussion.

5. Your group will make its presentation. Class discussion is encouraged.

Fourteen Essential Elements of ICS

1. **Common Terminology:** Using common terminology helps to define organizational functions, incident facilities, resource descriptions, and position titles.

2. **Modular Organization:** The Incident Command organizational structure develops in a top-down, modular fashion that is based on the size and complexity of the incident, as well as the specifics of the hazard environment created by the incident.

3. **Management by Objectives:** Includes establishing overarching objectives; developing and issuing assignments, plans, procedures and protocols; establishing specific, measurable objectives for various incident management functional activities; and directing efforts to attain the established objectives.

4. **Reliance on an IAP:** IAPs provide a coherent means of communicating the overall incident objectives in the contexts of both operational and support activities.

5. **Chain of Command and Unity of Command:** Chain of command refers to the orderly line of authority within the ranks of the incident management organization. Unity of command means that every individual has a designated supervisor to whom he or she reports at the scene of the incident. These principles clarify reporting relationships and eliminate the confusion caused by multiple, conflicting directives. Incident managers at all levels must be able to control the actions of all personnel under their supervision.

6. **Unified Command:** In incidents involving multiple jurisdictions, a single jurisdiction with multiagency involvement, or multiple jurisdictions with multiagency involvement, Unified Command allows agencies with different legal, geographic, and functional authorities and responsibilities to work together effectively without affecting individual agency authority, responsibility or accountability.

7. **Manageable Span of Control:** Span of control is key to effective and efficient incident management. Within ICS, the span of control of any individual with incident management supervisory responsibility should range from three to seven subordinates.

8. **Predesignated Incident Locations and Facilities:** Various types of operational locations and support facilities are established in the vicinity of an incident to accomplish a variety of purposes. Typical predesignated facilities include ICPs, Bases, Camps, Staging Areas, Mass Casualty Triage Areas, and others as required.

9. **Resource Management:** Resource management includes processes for categorizing, ordering, dispatching, tracking and recovering resources. It also includes processes for reimbursement for resources, as appropriate. Resources are defined as personnel, teams, equipment, supplies, and facilities available or potentially available for assignment or allocation in support of incident management and emergency response activities.

10. **Information and Intelligence Management:** The incident management organization must establish a process for gathering, sharing, and managing incident-related information and intelligence.

11. **Integrated Communications:** Incident communications are facilitated through the development and use of a common communications plan and interoperable communications processes and architectures.

12. **Transfer of Command:** The Command function must be established clearly from the beginning of an incident. When Command is transferred, the process must include a briefing that captures all essential information for continuing safe and effective operations.

13. **Accountability:** Effective accountability at all jurisdictional levels and within individual functional areas during incident operations is essential. To that end, the following principles must be adhered to:

a. **Check-In:** All responders, regardless of agency affiliation, must report in to receive an assignment in accordance with the procedures established by the IC.

b. **IAP:** Response operations must be directed and coordinated as outlined in the IAP.

c. **Unity of Command:** Each individual involved in incident operations will be assigned to only one supervisor.

d. **Span of Control:** Supervisors must be able to supervise and control their subordinates adequately, as well as communicate with and manage all resources under their supervision.

e. **Resource Tracking:** Supervisors must record and report resource status changes as they occur.

14. **Deployment:** Personnel and equipment should respond only when requested or when dispatched by an appropriate authority.

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Activity 2.2

Common Terminology — "Lego" Activity

Purpose

To achieve a better understanding of the importance of communications and common terminology in Unified Command.

Directions

1. You will be divided into two groups. Then, within those groups, you will be divided into Unified Command and Operations groups. (You will end up being divided into four groups.)

2. The Unified Command groups will be sent to separate rooms, where they will find a structure constructed of Legos.

3. The Operations groups will be sent to the other rooms where they will be provided with enough Legos to construct the structure as described by Unified Command via radio.

4. Command will look at the structure and communicate to Operations what to do to duplicate the structure. Groups may organize in any fashion that they want.

5. Groups should use common terminology in their communications. They should use the communications order model and confirm that the communications have been received. Groups will have 45 minutes for this portion of the activity.

6. The Operations groups will come back into the room with the originally constructed building, and the two groups will compare the buildings, Lego-by-Lego.

7. Gather together as a large group to discuss the activity.

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Activity 2.3

Initial Actions for Hazmat Response

Purpose

To identify and document appropriately their incident goals/objectives through the use of an Incident Command chart and ICS Form 201.

Directions

1. You will work in your same small groups.

2. In your group, identify if needed the following positions: an IC, Safety Officer, PIO, OSC, PSC, LSC and Finance/Administration Section Chief. If there are enough people in your group, you also may assign a Liaison Officer. The IC will speak for the group.

3. View the slide and then review the scenario and map on ICS Form 201 in the group activity.

4. You will also document your incident goals/objectives on an easel pad.

5. You will document the incident by filling out ICS Form 201 and an incident organizational chart, which will be placed on an easel pad.

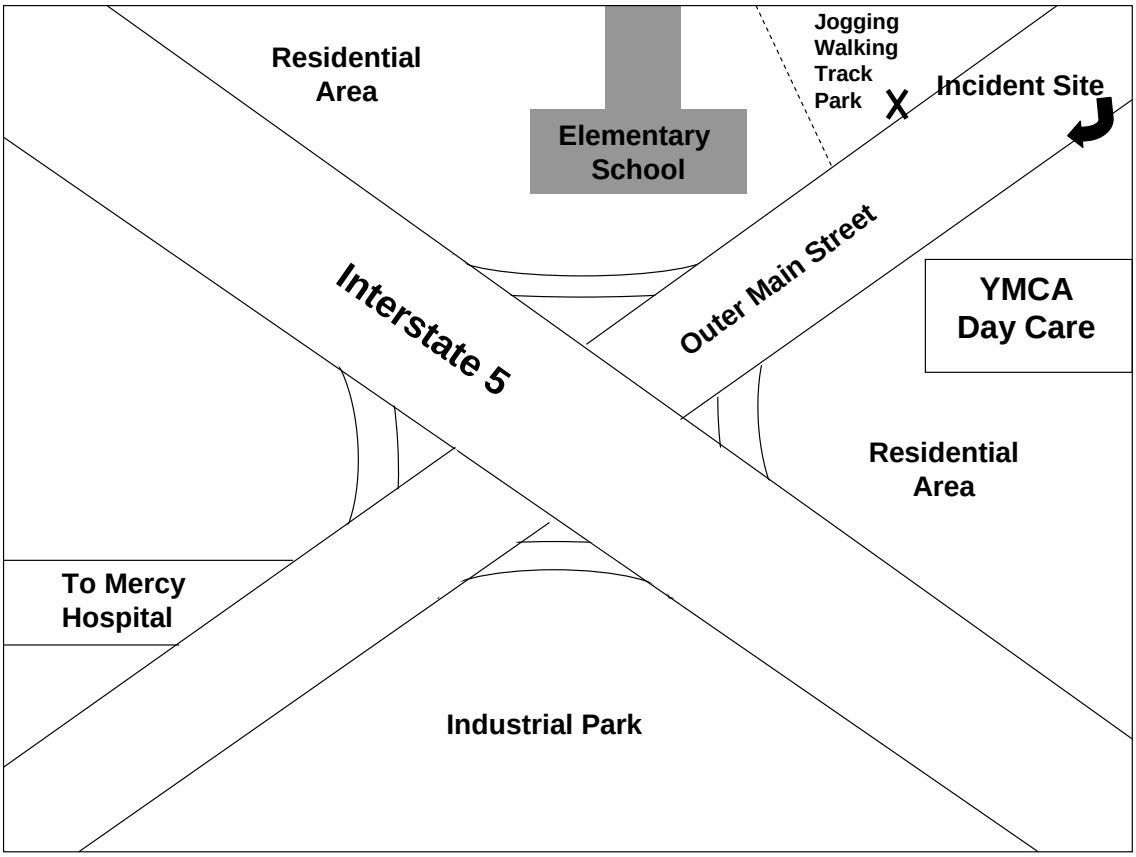
6. You will have 30 minutes for this activity and an additional 30 minutes for debriefing.

Scenario

On Jan. 15, at 0835 hours, a caller reports a home delivery truck has skidded off Outer Main Street and rolled over while trying to avoid a deer in the roadway. The caller gives no other information, conveying a need to get the kids to day care. Two engines, a ladder truck, BLS ambulance, and the duty chief are dispatched. The police department has an officer enroute from the station 3 miles away. Upon arrival, the officer of Rescue Engine 1 gives a size-up. "An overturned propane delivery truck off the west side of Outer Main Street, there is heavy traffic in the area and no driver contact." At 0840 hours, dispatch reports that the elementary school downwind has an unknown odor and children and staff are feeling sick. At 0842 hours, Chief 2 is delayed in traffic and will be investigating an apparent rear-end collision involving multiple vehicles.

INCIDENT BRIEFING HAZMAT/WMD	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED

4. INCIDENT MAP



5. OPERATIONAL CHECKLIST:

[ ] RESOURCES UPWIND, UPHILL, UPSTREAM	[ ] ZONES ESTABLISHED	[ ] COMMAND POST SET UP
[x] MATERIAL IDENTIFIED	[ ] HAZARD ASSESSMENT DONE	[ ] EVACUATION/SHELTERING
[ ] SAFE REFUGE ESTABLISHED	[ ] RESCUE	[ ] HOSPITAL NOTIFIED
[ ] CONTAINMENT, CONTROL	[ ] OFF-DUTY RECALL	[ ] MANDATORY NOTIFICATIONS
[ ] AIR SUPPLY/LIGHTING	[ ] PERSONNEL REHAB	[ ] LOCAL [ ] STATE [ ] FEDERAL
[ ] RESPONSIBLE PARTY ID	[ ] INVESTIGATION	[ ] CLEANUP COMPANY CALLED

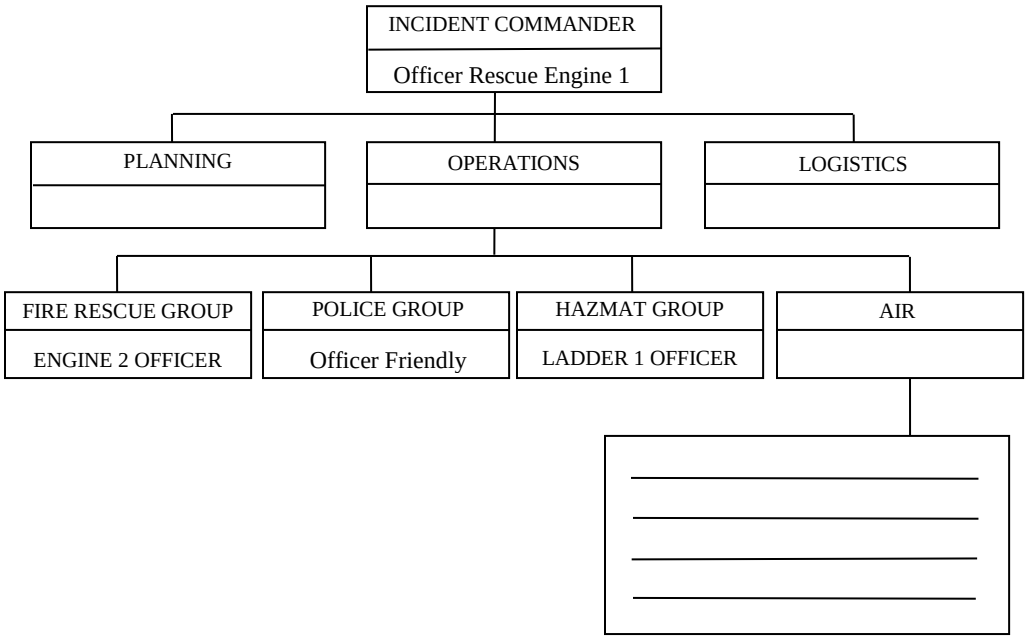
*PRIOR TO ENTRY

[ ] SAFETY OFFICER ASSIGNED	[ ] SITE SAFETY PLAN COMPLETED	[ ] DECONTAMINATION SET UP

ICS 201 (12/93) NFES 1325	PAGE 1	

7. SUMMARY OF CURRENT ACTIONS
Rescue Engine 1 officer established Command
Assessing situation and driver whereabouts
Need additional resources
Request Engine 3 to elementary school
Tasked law enforcement with traffic control/removal
Established perimeters

8. CURRENT ORGANIZATION



Safety Officer is Hazmat Tech from Rescue Engine 1
Need PIO

ICS 201 (12/93) **NFES 1325**	PAGE 3	

9. RESOURCES SUMMARY				
RESOURCES ORDERED	**RESOURCES IDENTIFICATION**	**ETA**	**ON SCENE √**	**LOCATION/ASSIGNMENT**
ICS 201 (12/93) NFES 1325	PAGE 4			

Activity 2.4

Fire and Explosion at Compressed Gas Facility

Purpose

To apply the appropriate strategic goals of an incident involving a simulated fire and explosion at a compressed gas facility, determine appropriate strategic goals and incident objectives and document the incident using appropriate ICS forms.

Directions

1. Review the scenario and material provided for this simulation incident.

2. Also review resources for your city (Center City) as well as neighboring communities.

3. In your small groups, you should answer the questions on the following Student Activity Worksheets (SAWs).

4. Diagram your incident management structure on an easel pad.

5. Explain your documentation of the incident.

6. Select a representative to explain how you managed this incident.

Scenario

Today, nearly two hours ago, an explosion and resulting fire engulfed the Compressed Gas Facility on Madison Street. The fire department was dispatched, and a box alarm was sounded. The initial alarm activated three engines, a ladder truck, advanced life support (ALS) ambulance, and the duty deputy chief. Upon arrival, the IC sized up the situation as a compressed gas facility with heavy fire on the D side of the building. All personnel working at the facility have been accounted for. IC requested a second alarm for both manpower and equipment.

Facility personnel have identified the major fire area to contain thousands of cylinders, vertical fixed storage tanks, horizontal fixed storage tanks, and box and tube trailers containing the following products: helium, hydrogen, argon, nitrogen, liquid oxygen, nitrous oxide, acetylene, MAPP gas, propane, and carbon dioxide.

There are approximately 14 thousand portable cylinders and other types of portable devices within and around this facility. The fixed tank on the AB corner contains liquid oxygen, the two vertical fixed tanks off the CD corner contain MAPP and propane, and the fixed horizontal fixed tanks on the D side contain argon, nitrous oxide, and carbon dioxide.

The site has a loading dock on the A side and an unattached loading dock approximately 40 feet off the AD corner facing Madison Street. There is very limited access to the facility due to the recent erection of a security fence and the parking of delivery trucks.

An overview of the surrounding area shows large industrial buildings to the immediate west, and further west are fixed vertical storage tanks that contain refined hydrocarbon products (gasoline and fuel oil) and associated docking pier. Northwest of the facility is a public boat-launching area and a large vacant industrial building. Northeast of the site is a crude oil offloading pier with a tanker offloading into the underground pipeline. East of the site is a 150 berth marina with a larger, 260 berth, full-service marina just beyond, both berthing vessels from 20 to 50 plus feet. There are 20, three-story townhouse condominiums abutting the smaller marina. Behind the townhouses is an eight-story condominium building. Southwest of the site is parking and open space. There is a community college in its second day of classes located beyond the marinas. Additionally, the flight path for the regional airport is directly overhead. Aircraft generally are flying about 1,800 feet at this point, slowly descending toward landing.

The IC had initial objectives to isolate the immediate area and place protective streams to knock down the thermal column. Sheltering-in-place options were to be discussed.

You will be summoned to determine what incident objectives and strategic goals, with tactical input, can be initiated and accomplished in the next six-hour operational period. You will conduct a Tactics Meeting/Planning Meeting with an instructor, and conduct an Operations Briefing where each team member is expected to present a portion of the IAP.

Activity 2.4 (cont'd)

Center City Resource Inventory

Resource Provider	Resource	Special Information
Center City	**Police Department**	
	Total uniformed staff 124	Normal shift manning:
	1 Chief	day 30, afternoon 30, midnight 22
	2 Assistant Chiefs	
	10 Shift Sergeants	
	8 Detectives	Trained as crime scene evidence techs
	2 Juvenile Officers	
	10 Special Services Units	SWAT, hostage negotiation, explosives
	10 Office and detention (3 holding cells)	
	59 Patrol Officers	
	2 Training Specialists	
	22 Reservists (Peace Officers)	Traffic, parade duty, special events
	Special equipment	30-passenger bus, robot (Bomb Unit) 14-foot boat on trailer, 50-horsepower (hp) motor
	Note: All police officers are state certified, the department is nationally accredited, all cars have automated external defibrillators (AEDs), and several officers are emergency medical technician (EMT) certified.	
	Fire Department	
	Total uniformed staff 111 full time, 32 call members (firefighter 1 certified)	
	1 Chief	
	4 Assistant Chiefs	
	1 Training Captain	
	4 Fire Prevention/Inspection/Investigation Officers	
	Engine 1 1,500 gpm, 1,000 gal tank (staffs 4)	
	Engine 2 1,500 gpm, 1,000 gal tank (staffs 4)	
	Engine 3 1,500 gpm, 1,000 gal tank (staffs 3)	
	Engine 4 1,250 gpm, 750 gal tank (staffs 3)	
	Ladder 1 100-foot ladder w/1,500 gpm and 200 gal tank (staffs 3)	
	Reserve Engine 5 1,000 gpm, 500 gal tank — not staffed	
	Rescue Engine 1 1,500 gpm, 1,000 gal tank (staffs 5) (responds to all calls)	
	Special Services Unit 1 — reserve engine equipped as a Level A Hazmat Unit staffed by Rescue 1 staff when needed (carries 100 gal aqueous film-forming foam (AFFF))	
	Ambulance 1 — BLS (staffs 2)	
	Reserve Ambulance 2 — not staffed	
	Special equipment	City command bus 14-foot rescue boat w/35-hp motor

Resource Provider	Resource	Special Information
	Note: All full-time firefighters are certified EMTs (various levels), 68 career and 32 call members are certified in hazmat operations, and 42 career are certified at the technician level. All Rescue, Engine and Ladder 1 staff are technicians and receive bonus pay. Engine companies do EMS first response for all life-threatening EMS calls. All members carry pagers for callback duty.	
Center City	**Public Works — total staff 87**	
	Street department, water department, parks department — also operate county sewage treatment plant	Dump trucks, snowplows, sand trucks, loaders, excavation equipment, barricades, and dewatering pumps
	Emergency Management/Planning Department — total staff 3	
		Maintain and support City EOC.
	American Red Cross — full-time staff 3, call staff of 12	
		Operate food services vehicle Negotiate contracts for emergency shelters
	Silver Cross EMS	
		1 ALS and 1 BLS transport staffed daily
	Mercy Hospital	
		40-bed short-term care emergency room, operating room (minor surgery only), nearest trauma center 45 minutes
North Town	**Police Department — total staff 32 Sworn Officers**	
15-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 4 Sergeants, 1 Juvenile Officer, 25 Patrol Officers	Rehab bus/Command Post (15 passengers)
	Fire Department — total staff of 22 full time and 20 call members	
	1 Chief, 1 Assistant Chief, 1 Fire Prevention/Investigation/Training Officer Engine 1 1,750 gpm, 1,250 gal tank (staffs 3) Engine 2 1,250 gpm, 1,000 gal tank (staffs 2) Ladder 1 100-foot quint 1,500 gpm, 200 gal tank (staffs 1) Reserve Engine 3 1,000 gpm, 1,000 gal tank — not staffed	

Resource Provider	Resource	Special Information
	EMS provided by Silver Cross Note: All staff hazmat operations trained and have a decontamination trailer.	
South Town	**Police Department — total staff 60 Sworn Officers, 14 Reservist (Peace Officers)**	
20-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 6 Shift Sergeants, 2 Juvenile Officers, 1 Training Officer, 50 Patrol Officers	
	Fire Department — total staff 38 career, 24 volunteer 1 Chief, 2 Assistant Chiefs, 1 Training Captain, 2 Fire Prevention/Public Ed, Fire Investigation Engine 1 1,500 gpm, 1,000 gal tank (staffs 4) Engine 2 1,500 gpm, 1,000 gal tank (staffs 4) Ladder 1 100-foot articulated boom — no pump/water (staffs 2) Ambulance 1 ALS level (staffs 2) Note: All career are level 2 firefighters, hazmat technician certified, and EMS trained. Volunteers are mostly level 2 firefighters, hazmat operations, some EMS trained.	
Ridge County	**Public Works — total staff 62** Typical highway department	
	Emergency Management	
30-minute response time for on-duty resources	Maintain and staff County EOC (staffs 15)	Operate County 911 dispatch center
	Health Department — total professional staff 34 including 14 RNs	
	Sheriff's Department — total staff of 67 Jail (staffs 24) Office/Booking/Evidence/etc. (staffs 8) Road patrol (staffs 30)	
State	**Police — typically 6 officers in county patrolling and other duties** Can provide 45 officers with 3-hour notice	

Resource Provider	Resource	Special Information
	Highway Department — typically 20 workers in county	
	Can provide 45 workers with 3-hour notice	
	National Guard	
	Engineering Unit in Center City — normal staffing is 100. Today 60 are deployed.	
Other Resources	**Civil Support Team 007**	
	3-hour response time	
	Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)	
	3-hour response time	
	FBI	
	3-hour response time	
	Baldwin Level A Hazmat Team	
	2-hour response time (staffs 8 technicians)	
	Exeter Level B Hazmat/Decontamination	
	2-hour response time (staffs 8 technicians)	
	Private hazmat spill cleanup contractor	
	3- to 4-hour response time	

Activity 2.4 (cont'd)

Size-Up Information Worksheet

Product(s): _____

Container(s): _____

Environment: _____

Other critical factors: _____

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Activity 2.4 (cont'd)

Strategic Goals/Incident Objectives Worksheet

Below are typical strategic goals or items that may become incident objectives. Use this page to write SMART incident objectives for each strategic goal you wish to use.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Recovery/Termination:
Other incident objectives/goals:

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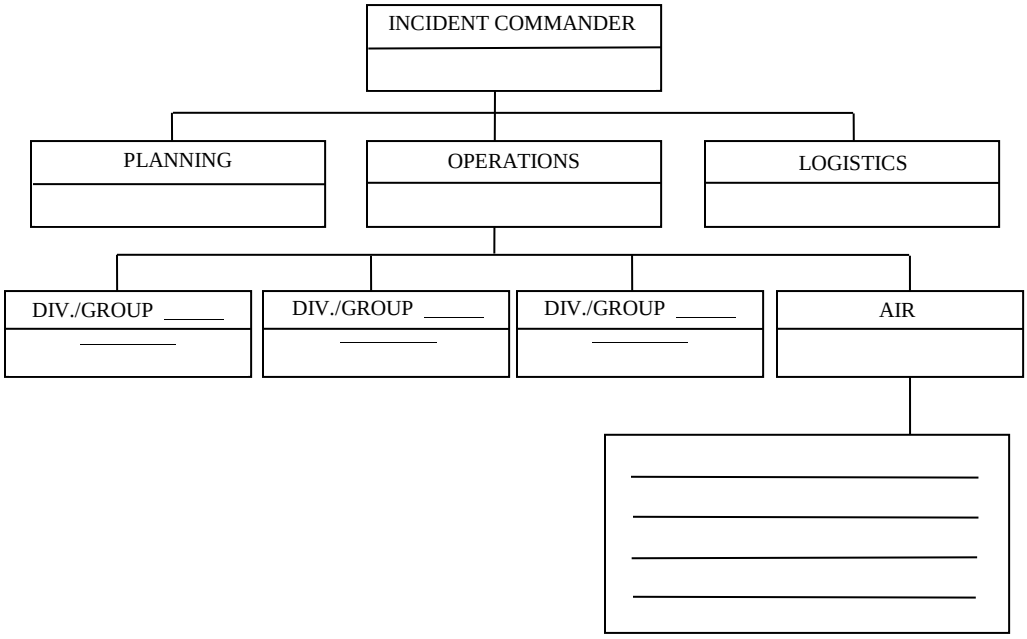
Activity 2.4 (cont'd)

ICS Form 201, Incident Briefing

INCIDENT BRIEFING	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. MAP SKETCH			
ICS 201 (12/93) **NFES 1325**	PAGE 1	5. PREPARED BY (NAME AND POSITION)	

6. SUMMARY OF CURRENT ACTIONS		
ICS 201 (12/93) **NFES 1325**	PAGE 2	

7. CURRENT ORGANIZATION



ICS 201 (12/93) **NFES 1325**	PAGE 3	

8. RESOURCES SUMMARY				
RESOURCES ORDERED	**RESOURCES IDENTIFICATION**	**ETA**	**ON SCENE √**	**LOCATION/ASSIGNMENT**
ICS 201 (12/93) NFES 1325	PAGE 4			

Activity 2.4 (cont'd)

ICS Form 202, Incident Objectives

INCIDENT OBJECTIVES	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. OPERATIONAL PERIOD (DATE/TIME)			
5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)			
6. WEATHER FORECAST FOR OPERATIONAL PERIOD			
7. GENERAL SAFETY MESSAGE			
8. ATTACHMENTS (√ IF ATTACHED) ☐ ORGANIZATION LIST (ICS 203) ☐ MEDICAL PLAN (ICS 206) ☐ _____ ☐ ASSIGNMENT LIST (ICS 204) ☐ INCIDENT MAP ☐ _____ ☐ COMMUNICATIONS PLAN (ICS 205) ☐ TRAFFIC PLAN ☐ _____			
202 ICS 3-80	9. PREPARED BY (PLANNING SECTION CHIEF)	10. APPROVED BY (INCIDENT COMMANDER)	

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Activity 2.4 (cont'd)

ICS Form 208HM, Site Safety and Control Plan

SITE SAFETY AND CONTROL PLAN ICS 208 HM	1. Incident Name:	2. Date Prepared:	3. Operational Period Time

Section I. Site Information

4. Incident Location:

Section II. Organization

5. Incident Commander:	6. HM Group Supervisor:	7. Tech, Specialist — HM Reference:
8. Safety Officer:	9. Entry Leader:	10. Site Access Control Leader:
11. Asst. Safety Officer — HM:	12. Decontamination Leader:	13. Safe Refuge Area Mgr.
14. Environmental Health:	15.	16.

17. Entry Team: (Buddy System) Name:	PPE Level	18. Decontamination Element: Name:	PPE Level
Entry 1		Decon 1	
Entry 2		Decon 2	
Entry 3		Decon 3	
Entry 4		Decon 4	

Section III. Hazard/Risk Analysis

19. Material:	Container type	Qty.	Phys. State	pH	IDLH	F.P.	I.T.	V.P.	V.D.	S.G.	LEL	UEL

Comment:

Section IV. Hazard Monitoring

20. LEL Instrument(s):	21. O_2 Instrument(s):
22. Toxicity/PPM Instrument(s):	23. Radiological Instrument(s):

Comment:

Section V. Decontamination Procedures

24. Standard Decontamination Procedures:	YES:	NO:

Comment:

Section VI. Site Communications

25. Command Frequency:	26. Tactical Frequency:	27. Entry Frequency:

Section VII. Medical Assistance

28. Medical Monitoring:	YES:	NO:	29. Medical Treatment and Transport In-Place:	YES:	NO:

Comment:

Section VIII. Site Map

30. Site Map:



Weather ☐ Command Post ☐ Zones ☐ Assembly Areas ☐ Escape Routes ☐ Other ☐

Section IX. Entry Objectives

31. Entry Objectives:

Section X. SOPs and Safe Work Practices

32. Modifications to Documented SOPs or Work Practices:	YES:	NO:

Comment:

Section XI. Emergency Procedures

33. Emergency Procedures:

Section XII. Safety Briefing

34. Asst. Safety Officer — HM Signature:	Safety Briefing Completed (Time):
35. HM Group Supervisor Signature:	36. Incident Commander Signature:

Activity 2.5

Graniteville Train Collision

Purpose

To document the Graniteville Train Collision incident using appropriate ICS forms, and to develop an appropriate IAP for the incident.

Directions

1. You will view the video "Graniteville Train Collision."

2. You will be divided into small groups. The instructor will review the scenario information provided.

Scenario: Graniteville Train Collision

Center City is a small community of about 27,500 residents. It is the center of county government, has the only hospital in the county, and has several small industries each employing 125 workers or less. The Center City fire department provides fire and EMS services to the city and neighboring community as well. Interstate 2008 passes by the edge of town, and the Pilot Knob Railway Company has two mainline tracks that pass through the city. There are six at-grade crossings that separate the east side from the west side of the city. There is a third set of tracks that is about one-half mile long that intersects the mainline in the center of the city and again on the north side of the city. This siding often is used as an area to park short trains that may be changing crews or placing cars on the three sidings within the city.

At about 3:15 a.m., a train of one engine and 24 cars, to be placed on sidings at two local industries, was placed on the siding in the city to clear the mainline for a southbound freight that was scheduled to pass at about 4 a.m. The local train crew pulled onto the siding and went to an all-night diner across the street for coffee.

At about 3:45 a.m., the 112-car southbound freight consisting of three engines and 112 cars of various products, including hazardous materials, was traveling southbound at a speed of 35 mph. Just as it was to pass the local train, its lead locomotive suddenly veered onto the siding where the local train was located. The engineer hit the emergency brakes but collided almost immediately with the parked train.

A call is received at the sheriff's office dispatch center reporting a train accident. The caller reports that all of a sudden there was a large fog cloud. Subsequent callers report the strong smell of chlorine. Dispatch tones out the Central City Fire Department, Center City Police Department, and Center City Ambulance.

Center City Fire Department response (headquarters) includes:

- Assistant Chief (Duty Chief).
- Engine 1 — three firefighters total.
- Engine 2 — three firefighters total.
- Ladder 1 — three firefighters total.
- Ambulance one — one paramedic and one EMT.

The remaining Center City Fire Department resources are located in outlying areas of the city.

Upon arrival, the assistant chief performs size-up from about 1,000 feet away (outside the vapor cloud) and determines that two trains appear to be involved. A vapor cloud is present near several overturned and damaged railcars. There are no railroad personnel present. Due to the vapor cloud and the damage to the street lights and electrical system in the area, it is dark. The IC is unable to determine railcar numbers, placards or any other details. It is clearly evident that at least one car was carrying a chlorine-based product that is being released.

Dispatch informs the IC that it has received a call from an individual in the warehouse adjacent to the incident who is having difficulty breathing and requesting to be rescued. There is no wind, and the vapor cloud is starting to drift near downtown residential buildings and toward the east side of the city.

The IC orders first-alarm assignment to initiate initial evacuation and calls for a second alarm that is to report to a Staging Area about 2,500 feet away from First and Main streets. This will summon the chief, fire inspectors, on-call firefighters, and one mutual-aid engine to provide fire protection for the rest of the city. Additionally off-duty firefighters returning to work also will staff the reserve engine. The IC summons the Level A and Level B Hazmat Response Teams (one each) and asks that the County EOC be activated.

After about 10 minutes, a person arrives at the CP on foot and identifies himself as the train engineer for the train that was on the siding. He has the train consist for the cars on his train. He is uncertain how many cars on his train are damaged and may be leaking. He states that as he pulled the shipping papers, there did not appear to be any fire.

Parked train:

- Twelve cars of wood products.
- Two cars of poly vinyl chloride (PVC) plastic.
- Six cars of new automobiles.
- One car of acetone cyanohydrin.
- Two cars of toluene diisocyanate.
- One car of 400 gallons sulfuric acid totes tanks.

The train engineer attempts to reach his dispatcher to obtain information about what may have been on the derailed train. He is informed that there are 14 cars containing hazardous materials and 98 cars of general freight.

Derailed train:

- Eight cars of chlorine.
- Four cars of oleum (funding sulfuric acid).
- One car of hydrochloric acid.
- One car of acetylene.

Not having a Level A or B capability, the Center City Fire Department must await the mutual-aid teams. You, the student, now have arrived on-scene and will be assuming Command of the incident. After an incident briefing from the assistant chief and incident information shared, the assistant chief provides you with a completed ICS Form 201. You now plan for the next operational period.

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Activity 2.5 (cont'd)

Center City Resource Inventory

Resource Provider	Resource	Special Information
Center City	**Police Department**	
	Total uniformed staff 124	Normal shift manning:
	1 Chief	day 30, afternoon 30, midnight 22
	2 Assistant Chiefs	
	10 Shift Sergeants	
	8 Detectives	Trained as crime scene evidence techs
	2 Juvenile Officers	
	10 Special Services Units	SWAT, hostage negotiation, explosives
	10 Office and detention (3 holding cells)	
	59 Patrol Officers	
	2 Training Specialists	
	22 Reservists (Peace Officers)	Traffic, parade duty, special events
	Special equipment	30-passenger bus, robot (Bomb Unit) 14-foot boat on trailer, 50-hp motor
	Note: All police officers are state certified, the department is nationally accredited, all cars have AEDs, and several officers are EMT certified.	
	Fire Department	
	Total uniformed staff 111 full time, 32 call members (firefighter 1 certified)	
	1 Chief	
	4 Assistant Chiefs	
	1 Training Captain	
	4 Fire Prevention/Inspection/Investigation Officers	
	Engine 1 1,500 gpm, 1,000 gal tank (staffs 4)	
	Engine 2 1,500 gpm, 1,000 gal tank (staffs 4)	
	Engine 3 1,500 gpm, 1,000 gal tank (staffs 3)	
	Engine 4 1,250 gpm, 750 gal tank (staffs 3)	
	Ladder 1 100-foot ladder w/1,500 gpm and 200 gal tank (staffs 3)	
	Reserve Engine 5 1,000 gpm, 500 gal tank — not staffed	
	Rescue Engine 1 1,500 gpm, 1,000 gal tank (staffs 5) (responds to all calls)	
	Special Services Unit 1 — reserve engine equipped as a Level A Hazmat Unit staffed by Rescue 1 staff when needed (carries 100 gal AFFF)	
	Ambulance 1 — BLS (staffs 2)	
	Reserve Ambulance 2 — not staffed	
	Special equipment	City command bus 14-foot rescue boat w/35-hp motor

Resource Provider	Resource	Special Information
	Note: All full-time firefighters are certified EMTs (various levels), 68 career and 32 call members are certified in hazmat operations, and 42 career are certified at the technician level. All Rescue, Engine and Ladder 1 staff are technicians and receive bonus pay. Engine companies do EMS first response for all life-threatening EMS calls. All members carry pagers for callback duty.	
Center City	**Public Works — total staff 87**	
	Street department, water department, parks department — also operate county sewage treatment plant	Dump trucks, snowplows, sand trucks, loaders, excavation equipment, barricades, and dewatering pumps
	Emergency Management/Planning Department — total staff 3	
		Maintain and support City EOC.
	American Red Cross — full-time staff 3, call staff of 12	
		Operate food services vehicle Negotiate contracts for emergency shelters
	Silver Cross EMS	
		1 ALS and 1 BLS transport staffed daily
	Mercy Hospital	
		40-bed short-term care emergency room, operating room (minor surgery only), nearest trauma center 45 minutes
North Town	**Police Department — total staff 32 Sworn Officers**	
15-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 4 Sergeants, 1 Juvenile Officer, 25 Patrol Officers	Rehab bus/Command Post (15 passengers)
	Fire Department — total staff of 22 full time and 20 call members	
	1 Chief, 1 Assistant Chief, 1 Fire Prevention/Investigation/Training Officer Engine 1 1,750 gpm, 1,250 gal tank (staffs 3) Engine 2 1,250 gpm, 1,000 gal tank (staffs 2) Ladder 1 100-foot quint 1,500 gpm, 200 gal tank (staffs 1) Reserve Engine 3 1,000 gpm, 1,000 gal tank — not staffed	

Resource Provider	Resource	Special Information
	EMS provided by Silver Cross	
	Note: All staff hazmat operations trained and have a decontamination trailer.	
South Town	**Police Department — total staff 60 Sworn Officers, 14 Reservist (Peace Officers)**	
20-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 6 Shift Sergeants, 2 Juvenile Officers, 1 Training Officer, 50 Patrol Officers	
	Fire Department — total staff 38 career, 24 volunteer	
	1 Chief, 2 Assistant Chiefs, 1 Training Captain, 2 Fire Prevention/Public Ed, Fire Investigation	
	Engine 1 1,500 gpm, 1,000 gal tank (staffs 4) Engine 2 1,500 gpm, 1,000 gal tank (staffs 4) Ladder 1 100-foot articulated boom — no pump/water (staffs 2) Ambulance 1 ALS level (staffs 2)	
	Note: All career are level 2 firefighters, hazmat technician certified, and EMS trained. Volunteers are mostly level 2 firefighters, hazmat operations, some EMS trained.	
Ridge County	**Public Works — total staff 62**	
	Typical highway department	
	Emergency Management	
30-minute response time for on-duty resources	Maintain and staff County EOC (staffs 15)	Operate County 911 dispatch center
	Health Department — total professional staff 34 including 14 RNs	
	Sheriff's Department — total staff of 67	
	Jail (staffs 24) Office/Booking/Evidence/etc. (staffs 8) Road patrol (staffs 30)	
State	**Police — typically 6 officers in county patrolling and other duties**	
	Can provide 45 officers with 3-hour notice	

Resource Provider	Resource	Special Information
	Highway Department — typically 20 workers in county	
	Can provide 45 workers with 3-hour notice	
	National Guard	
	Engineering Unit in Center City — normal staffing is 100. Today 60 are deployed.	
Other Resources	**Civil Support Team 007**	
	3-hour response time	
	ATF	
	3-hour response time	
	FBI	
	3-hour response time	
	Baldwin Level A Hazmat Team	
	2-hour response time (staffs 8 technicians)	
	Exeter Level B Hazmat/Decontamination	
	2-hour response time (staffs 8 technicians)	
	Private hazmat spill cleanup contractor	
	3- to 4-hour response time	

Activity 2.5 (cont'd)

Size-Up Information Worksheet

Product(s): _____

Container(s): _____

Environment: _____

Other critical factors: _____

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Activity 2.5 (cont'd)

Strategic Goals/Incident Objectives Worksheet

Below are typical strategic goals or items that may become incident objectives. Use this page to write SMART incident objectives for each strategic goal you wish to use.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Recovery/Termination:
Other incident objectives/goals:

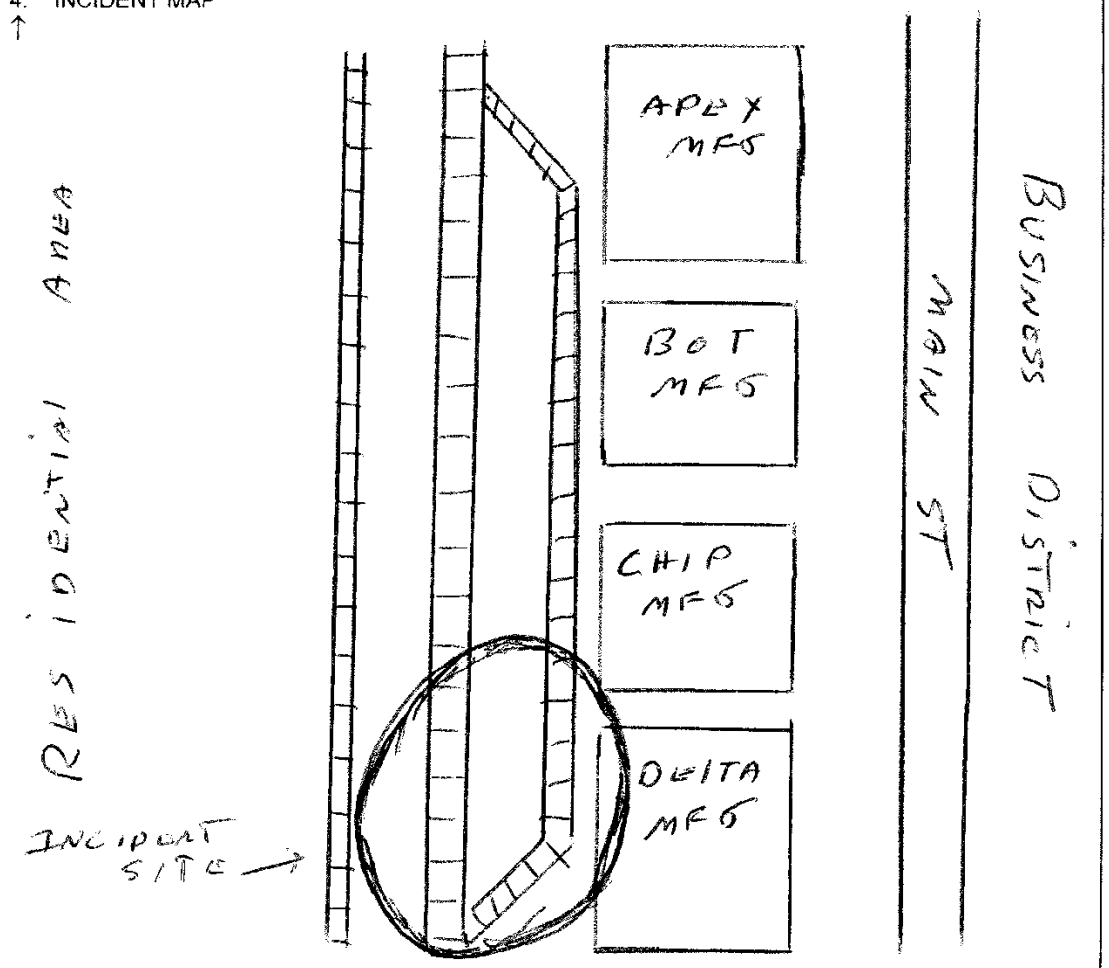
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Activity 2.5 (cont'd)

ICS Form 201, Incident Debriefing

INCIDENT DEBRIEFING HAZMAT/WMD	1. INCIDENT NAME: TRAIN WRECK	2. DATE PREPARED: TODAY	3. TIME PREPARED: 04:30

4. INCIDENT MAP



5. OPERATIONAL CHECKLIST:

[ ] RESOURCES UPWIND, UPHILL, UPSTREAM	[ ] ZONES ESTABLISHED	[ ] COMMAND POST SET UP
[ ] MATERIAL IDENTIFIED	[ ] HAZARD ASSESSMENT DONE	[ ] EVACUATION/SHELTERING
[ ] SAFE REFUGE ESTABLISHED	[ ] RESCUE	[ ] HOSPITAL NOTIFIED
[ ] CONTAINMENT, CONTROL	[ ] OFF-DUTY RECALL	[ ] MANDATORY NOTIFICATIONS
[ ] AIR SUPPLY/LIGHTING	[ ] PERSONNEL REHAB	[ ] LOCAL [ ] STATE [ ] FEDERAL
[ ] RESPONSIBLE PARTY ID	[ ] INVESTIGATION	[ ] CLEANUP COMPANY CALLED
*PRIOR TO ENTRY		
[ ] SAFETY OFFICER ASSIGNED	[ ] SITE SAFETY PLAN COMPLETED	[ ] DECONTAMINATION SET UP

ICS 201 (HM)	PAGE 1	6. PREPARED BY (NAME AND TITLE): ASST Chief Barnes

7. CURRENT ACTIONS

1. Massive release of chemical in downtown area near industrial park. Strong odor of chlorine all over area.

2. Cause of incident appears to have occurred when a southbound freight train ran into a parked train on the industrial warehouse siding. A train of 24 cars, to be placed at local businesses, was parked on the siding.

3. A major part of the city is without electricity due to the wreckage taking down lines.

4. All off-duty firefighters, including call firefighters, have been summoned to duty and will staff reserve equipment.

5. Both Level A and B hazmat teams have been summoned.

6. Dispatch was asked to notify the emergency manager and request that the EOC be opened.

7. No entry has been made into the vapor cloud area. First-alarm firefighters and police officers have been working to initiate an evacuation of the area just outside the vapor cloud. Firefighters are wearing structural gear and self-contained breathing apparatus (SCBA). Law enforcement has been told to move further away from the cloud.

8. Initially Department of Transportation (DOT)/Emergency Relocation Group (ERG) is used for Chlorine UN 1017 and guide page 123. Isolation table for large spill at night indicates initial isolation of 800 feet and downwind 4.6 miles.

9. No offensive operations have been initiated.

10. A worker from a warehouse next to the rail line called for help. Unable to initiate a safe rescue effort with resources currently available.

8. INCIDENT OBJECTIVES

Isolation — initially isolate 800 feet and then downwind 4.6 miles.

Notification — dispatch has notified local fire department, police, emergency manager, mutual-aid Hazmat Teams, state police and CHEMTREC.

Identification — train consist indicates chlorine, oleum, hydrochloric acid, and acetylene on derailed train.

Protection — DOT/ERG 124 states SCBA, structural gear limited protection in fire situations — not effective in spills.

Control — Spill: none
Leak: none
Fire: none

Termination — NA

10. ASSIGNED RESOURCES				
RESOURCES ORDERED	**RESOURCE IDENTIFICATION**	**ETA**	**ON-SCENE TIME**	**LOCATION ASSESSMENT**
CC Eng 1	Eng 1		0347	Evac east side
CC Eng 2	Eng 2		0347	Evac north side
CC Ladder 1	Ladder 1		0347	Evac south side
CC Rescue Eng 1	Rescue 1		0347	Evac west side
CC Eng 3	Eng 3		0355	Staging
CC Eng 4	Eng 4		0355	Staging
CC Ambulance 1	Amb 1		0355	Staging
CC Spec Service 1	Hazmat 1	0430		Staging
CC Reserve Eng 5	Eng 4	0415		CC Station 1
CC Reserve Amb 2	Amb 2	0415		CC Station 1
CC Command bus	Com 1	0430		Staging
Exter HM Level B	HM 2	0600		Staging

11. REMARKS (USE FOR POST-INCIDENT CRITIQUE)

1. Unable to make rescue attempt for victim in warehouse.
2. Rail crew from southbound train whereabouts unknown.
3. Incident will create a major incident, evacuation and damage.
4. Objectives need to ensure safety of responders.

ICS 201 (HM)	**PAGE 4**	

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Activity 2.5 (cont'd)

ICS Form 202, Incident Objectives

INCIDENT OBJECTIVES	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. OPERATIONAL PERIOD (DATE/TIME)			
5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)			
6. WEATHER FORECAST FOR OPERATIONAL PERIOD			
7. GENERAL SAFETY MESSAGE			
8. ATTACHMENTS (√ IF ATTACHED) ☐ ORGANIZATION LIST (ICS 203) ☐ MEDICAL PLAN (ICS 206) ☐ _____ ☐ ASSIGNMENT LIST (ICS 204) ☐ INCIDENT MAP ☐ _____ ☐ COMMUNICATIONS PLAN (ICS 205) ☐ TRAFFIC PLAN ☐ _____			
202 ICS 3-80	9. PREPARED BY (PLANNING SECTION CHIEF)	10. APPROVED BY (INCIDENT COMMANDER)	

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Activity 2.5 (cont'd)

ICS Form 206, Medical Plan

MEDICAL PLAN	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED	4. OPERATIONAL PERIOD

5. INCIDENT MEDICAL AID STATIONS

MEDICAL AID STATIONS	LOCATION	PARAMEDICS	
		YES	NO

6. TRANSPORTATION

A. AMBULANCE SERVICES

NAME	ADDRESS	PHONE	PARAMEDICS	
			YES	NO

B. INCIDENT AMBULANCES

NAME	LOCATION	PARAMEDICS	
		YES	NO

7. HOSPITALS

NAME	ADDRESS	TRAVEL TIME		PHONE	HELIPAD		BURN CENTER	
		AIR	GRND		YES	NO	YES	NO

8. MEDICAL EMERGENCY PROCEDURES

206 **ICS** 8-78	9. PREPARED BY (MEDICAL UNIT LEADER)	10. REVIEWED BY (SAFETY OFFICER)

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Activity 2.5 (cont'd)

ICS Form 208HM, Site Safety and Control Plan

SITE SAFETY AND CONTROL PLAN ICS 208 HM	1. Incident Name:	2. Date Prepared:	3. Operational Period Time

Section I. Site Information

4. Incident Location:

Section II. Organization

5. Incident Commander:	6. HM Group Supervisor:	7. Tech, Specialist — HM Reference:
8. Safety Officer:	9. Entry Leader:	10. Site Access Control Leader:
11. Asst. Safety Officer — HM:	12. Decontamination Leader:	13. Safe Refuge Area Mgr.
14. Environmental Health:	15.	16.

17. Entry Team: (Buddy System) Name:	PPE Level	18. Decontamination Element: Name:	PPE Level
Entry 1		Decon 1	
Entry 2		Decon 2	
Entry 3		Decon 3	
Entry 4		Decon 4	

Section III. Hazard/Risk Analysis

19. Material:	Container type	Qty.	Phys. State	pH	IDLH	F.P.	I.T.	V.P.	V.D.	S.G.	LEL	UEL

Comment:

Section IV. Hazard Monitoring

20. LEL Instrument(s):	21. O_2 Instrument(s):
22. Toxicity/PPM Instrument(s):	23. Radiological Instrument(s):

Comment:

Section V. Decontamination Procedures

24. Standard Decontamination Procedures:	YES:	NO:

Comment:

Section VI. Site Communications

25. Command Frequency:	26. Tactical Frequency:	27. Entry Frequency:

Section VII. Medical Assistance

28. Medical Monitoring:	YES:	NO:	29. Medical Treatment and Transport In-Place:	YES:	NO:

Comment:

ICS 208 HM **Page 1** **3/98**

Section VIII. Site Map

30. Site Map:



Weather ☐ Command Post ☐ Zones ☐ Assembly Areas ☐ Escape Routes ☐ Other ☐

Section IX. Entry Objectives

31. Entry Objectives:

Section X. SOPs and Safe Work Practices

32. Modifications to Documented SOPs or Work Practices:	YES:	NO:

Comment:

Section XI. Emergency Procedures

33. Emergency Procedures:

Section XII. Safety Briefing

34. Asst. Safety Officer — HM Signature:	Safety Briefing Completed (Time):
35. HM Group Supervisor Signature:	36. Incident Commander Signature:

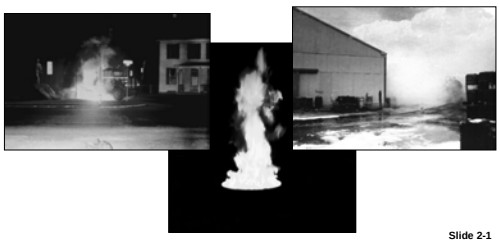
NOTE-TAKING GUIDE

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NOTE-TAKING GUIDE

Slide 2-1

HAZARDOUS MATERIALS INCIDENT MANAGEMENT



Slide 2-1

Slide 2-2

UNIT 2: INCIDENT COMMAND SYSTEM

Slide 2-2

Slide 2-3

TERMINAL OBJECTIVE

The students will be able to demonstrate knowledge of Incident Command System (ICS)/Emergency Operations Center (EOC) organization and operations at hazardous materials/weapons of mass destruction (hazmat/WMD) incidents to include the process of transfer of Command and the development/implementation of an effective Incident Action Plan (IAP).

Slide 2-3

Slide 2-4

ENABLING OBJECTIVES

The students will:

- **Demonstrate the following:**
  - **– Roles and responsibilities of Command and General Staff.**
  - **– Single versus Unified Command.**
  - **– ICS structure (Divisions/Groups/Branches).**
  - **– First-arriving Incident Commander (IC).**
  - **– Transfer of Command.**
  - **– Safety Officer required.**
  - **– Resources — Go/No Go.**

Slide 2-4

Slide 2-5

ENABLING OBJECTIVES (cont'd)

- **Demonstrate competency/use of appropriate ICS forms needed to compile a safe and effective IAP that addresses the seven incident objectives/goals of hazmat/WMD incidents.**

Slide 2-5

Slide 2-6

ENABLING OBJECTIVES (cont'd)

- **Explain the organization and interaction of both an Incident Command Post (ICP) and an EOC for hazmat/WMD incidents, and identify the following:**
  - **– Role of the ICP.**
  - **– Role of the EOC, to include how it's activated.**
  - **– Interaction of ICP with the EOC.**

Slide 2-6

Slide 2-7

Activity 2.1
Fourteen Essential Elements of ICS

Slide 2-7

Slide 2-8

SINGLE VERSUS UNIFIED COMMAND

Single Command

- **Applies when there is no overlap of jurisdictional boundaries or when a single IC is designated by the agency with overall management responsibility for the incident.**

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SINGLE VERSUS UNIFIED COMMAND (cont'd)

Unified Command

- **Applies ICS in incidents involving multiple jurisdictions or organizations.**
- **Enables institutions and agencies with different legal, geographic and functional responsibilities to coordinate, plan and interact effectively.**

Slide 2-9

Slide 2-10

SINGLE VERSUS UNIFIED COMMAND (cont'd)

- **The ICs within the Unified Command make joint decisions and speak as one voice. Any differences are worked out within the Unified Command.**

Slide 2-10

Slide 2-11

SINGLE VERSUS UNIFIED COMMAND (cont'd)

- **Unity of Command is maintained. Each responder reports to a single supervisor within his or her area of expertise. Within a Unified Command, the police officer would not tell the firefighters how to do their job.**

Slide 2-11

Slide 2-12

ICS STRUCTURE (DIVISIONS/GROUPS/BRANCHES)

- **Branch**
- **Division**
- **Group**
- **Unit**

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Slide 2-13

OTHER COMMANDS AND CONSIDERATIONS

- **Area Command**
- **Crisis management**
- **Consequence management**

Slide 2-13

Slide 2-14

FIRST-ARRIVING UNIT/IC

1910.120(q)(3)(i) Procedures for Handling Emergency Response:

The senior emergency response official responding to an emergency shall become the individual in charge of a site-specific ICS. All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer.

Slide 2-14

Slide 2-15

FIRST-ARRIVING UNIT/IC (cont'd)

Note to paragraph **(q)(3)(i) — The "senior official" at an emergency response is the most senior official on the site who has the responsibility for controlling the operations at the site. Initially it is the senior officer on the first-due piece of responding emergency apparatus to arrive on the incident scene. As more senior officers arrive (i.e., Battalion Chief, fire chief, state law enforcement official, site coordinator, etc.), the position is passed up the line of authority which has been previously established.**

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Slide 2-16

SAFETY OFFICER REQUIRED

1910.120(q)(3)(vii)

The individual in charge of the ICS shall designate a Safety Officer, who is knowledgeable in the operations being implemented at the emergency response site, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

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SAFETY OFFICER REQUIRED (cont'd)

1910.120(q)(3)(viii)

When activities are judged by the Safety Officer to be immediately dangerous to life and health (IDLH) and/or to involve an imminent danger condition, the Safety Officer 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.

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Activity 2.2 Common Terminology — "Lego" Activity

Slide 2-18

Slide 2-19

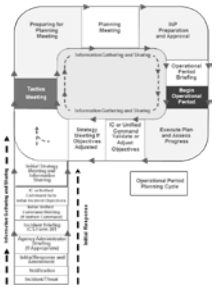
PLANNING PROCESS/ PLANNING "P"



Slide 2-19

Slide 2-20

PLANNING "P" VIDEO



Slide 2-20

Slide 2-21

TRANSFER OF COMMAND

- **The process of moving the responsibility for Incident Command from one IC to another is called "transfer of Command."**
- **It should be recognized that transition of Command on an expanding incident is to be expected.**
- **It does not reflect on the competency of the current IC.**

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Slide 2-22

FIVE STEPS FOR TRANSFERRING COMMAND

Step 1: The incoming IC should, if at all possible, personally perform an assessment of the incident situation with the existing IC.

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FIVE STEPS FOR TRANSFERRING COMMAND (cont'd)

Step 2: The incoming IC must be adequately briefed. This briefing must be by the current IC, and take place face-to-face if possible.

- **ICS Form 201, Incident Briefing**
- **Tactical Worksheet**

Slide 2-23

Slide 2-24

FIVE STEPS FOR TRANSFERRING COMMAND (cont'd)

Step 2: The briefing must cover the following:

- **Incident history (what has happened)**
- **Priorities and objectives**
- **Current plan**
- **Resource assignments**
- **Incident organization**
- **Resources ordered/ needed**
- **Facilities established**
- **Status of communications**
- **Any constraints or limitations**
- **Incident potential**
- **Delegation of authority**

Slide 2-24

Slide 2-25

FIVE STEPS FOR TRANSFERRING COMMAND (cont'd)

- **ICS Form 201 is especially designed to assist in incident briefings.**
- **It should be used whenever possible because it provides a written record of the incident as of the time prepared.**

Slide 2-25

Slide 2-26

FIVE STEPS FOR TRANSFERRING COMMAND (cont'd)

ICS Form 201 contains:

- **Incident objectives.**
- **A place for a sketch map.**
- **Summary of current actions.**
- **Organizational framework.**
- **Resources summary.**

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FIVE STEPS FOR TRANSFERRING COMMAND (cont'd)

Step 3: After the incident briefing, the incoming IC should determine an appropriate time for transfer of Command.

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FIVE STEPS FOR TRANSFERRING COMMAND (cont'd)

Step 4: At the appropriate time, notice of a change in Incident Command should be made to:

- **Agency headquarters (through dispatch).**
- **General Staff members (if designated).**
- **Command Staff members (if designated).**
- **All incident personnel.**

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FIVE STEPS FOR TRANSFERRING COMMAND (cont'd)

Step 5: The incoming IC may give the previous IC another assignment on the incident. There are several advantages of this:

- **The initial IC retains first-hand knowledge at the incident site.**
- **This strategy allows the initial IC to observe the progress of the incident and to gain experience.**

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RESOURCES

- **Responder/Team types**
- **Physical types**
- **Financial types**
- **Resource typing website: http://www.fema.gov/pdf/emergency/nims/fire_haz_mat.pdf**

Depending on Resources Go/No Go

Slide 2-30

Slide 2-31

INCIDENT GOALS AND OBJECTIVES

- **Incident objectives — state what will be accomplished.**
- **Strategies — establish the general plan or direction for accomplishing the incident objectives.**
- **Tactics — specify how the strategies will be executed.**

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HAZMAT/WMD INCIDENT OBJECTIVES

- **Isolation**
- **Notification**
- **Identification**
- **Protection**
- **Control**
- **Recovery**
- **Termination**

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WRITING "SMART" OBJECTIVES

- **Specific — Is the wording precise and unambiguous?**
- **Measurable — How will achievements be measured?**
- **Achievable — Use an action word to describe expected accomplishments.**
- **Realistic — Is the outcome achievable with given available resources?**
- **Timeframed — What is the timeframe?**

Slide 2-33

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Activity 2.3
Initial Actions for Hazmat Response

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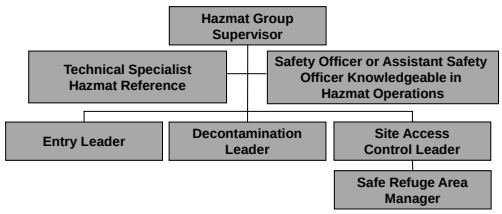
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HAZMAT/WMD GROUP/BRANCH



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Slide 2-37

HAZMAT/WMD GROUP SUPERVISOR/BRANCH DIRECTOR

- **Reports to the Operations Section Chief (OSC)**
- **Directs Hazmat/WMD Groups**
- **Implements hazmat/WMD elements of the IAP**
- **Oversees three primary functions**
  - **Entry into Exclusion Zones**
  - **Decontamination**
  - **Site access control**

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HAZMAT/WMD GROUP SUPERVISOR/BRANCH DIRECTOR (cont'd)

- **Coordinates with Safety Officer or Assistant Safety Officer**
- **Coordinates with technical specialists**
- **Evaluates and recommends public protection measures**
- **Ensures proper personal protective equipment (PPE) is being worn**
- **Maintains ICS Form 214, Unit/Activity Log**

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ENTRY LEADER

- **Reports to Hazmat/WMD Group Supervisor**
- **Responsible for overall entry within Exclusion Zone**
- **Supervises rescue operations within the Exclusion Zone**
- **Supervises all activities within Exclusion Zone**
- **Maintains ICS Form 214**

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DECONTAMINATION LEADER

- **Reports to Hazmat/WMD Group Supervisor**
- **Responsible for operations within the Contamination Reduction Zone (CRZ) (decontamination corridor)**
- **Coordinates special decontamination procedures as prescribed in the IAP**
- **Maintains ICS Form 214**

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SITE ACCESS CONTROL LEADER

- **Reports to Hazmat/WMD Group Supervisor**
- **Responsible for control and movement of people and equipment through access routes at hazard site**
- **Ensures that contaminants are contained, controlled and records kept**
- **Coordinates with Medical Group for separation of people based on their exposure**
- **Maintains ICS Form 214**

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SAFE REFUGE AREA MANAGER

- **Reports to Site Access Control Leader**
- **Evaluates and prioritizes victims for treatment (usually at intersection of Hot/ Warm Zone)**
- **Collects information from victims**
- **Prevents spread of contamination**
- **Coordinates with Decontamination Team Leader and Entry Leader**

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TECHNICAL SPECIALIST/ HAZMAT/WMD REFERENCE

- **Reports to the Planning Section Chief (PSC) — may be detailed to Hazmat/WMD Group Supervisor**
- **Provides technical assistance regarding the product, container and operations being implemented**
- **Uses various reference sources**
- **Maintains ICS Form 214**

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SAFETY OFFICER OR ASSISTANT SAFETY OFFICER/HAZMAT/WMD

- **Safety Officer reports to IC.**
- **Assistant Safety Officer reports to Incident Safety Officer.**
- **IC is required by 29 Code of Federal Regulations (CFR) 1910.120(q)(3)(vii) to designate a Safety Officer knowledgeable with operations being implemented.**
- **Coordinates safety-related activities — makes recommendations to manage safety issues.**

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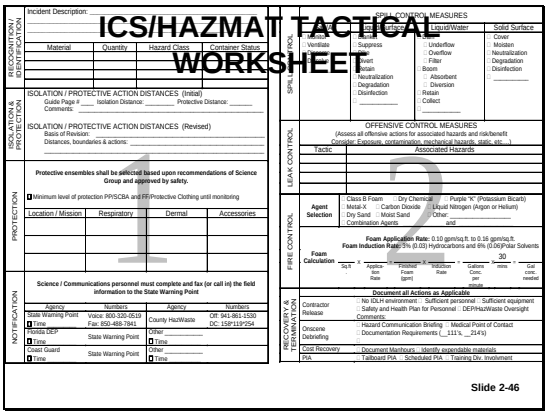
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SAFETY OFFICER OR ASSISTANT SAFETY OFFICER/HAZMAT/WMD (cont'd)

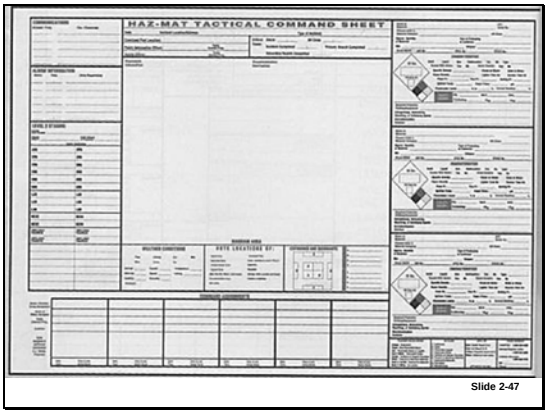
- **Has authority under 29 CFR 1910.120(q)(3)(viii) to alter, suspend or terminate operations when Safety Officer determines activities to be IDLH or to involve imminent danger.**
- **The Safety Officer shall immediately notify IC of actions taken. An Assistant Safety Officer would coordinate such activity through the Safety Officer.**

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ICS FORMS VERSUS TACTICAL WORKSHEET

The value of a worksheet:

- **It's vital for any IC to be able to quickly size up an incident, develop a strategy (either offensive or defensive), and develop an IAP.**
- **These key early decisions will determine the outcome of the incident, as well as firefighter safety, communications and incident organization overall.**

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ICS FORMS VERSUS TACTICAL WORKSHEET (cont'd)

- **The Tactical Worksheet is a critical piece of equipment because it helps the IC organize these and other tasks by providing reminders, prompts and a convenient workspace for tracking companies, apparatus and resources.**

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ICS FORMS VERSUS TACTICAL WORKSHEET (cont'd)

- **By documenting the assignments, Division/ Group officers, and Division/Group resources, the IC creates a visual reference of the overall incident organization and deployment.**

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ICS FORMS VERSUS TACTICAL WORKSHEET (cont'd)

- **The worksheet is also an excellent tool for passing Command.**
- **Tactical Worksheet information can be used as a foundation to document an ICS Form 201.**

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ICS FORMS

http://training.fema.gov/EMIWeb/IS/ICSResource/icsforms.htm

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ICS FORMS

Forms aid incident management for plan development:

- **Identify incident objectives**
- **Identify organization to meet objectives**
- **Ensure resource accountability**
- **Identify task assignments**
- **Specify support and service needs**
- **Clarify thinking and focus on accomplishing objectives**

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ICS FORMS (cont'd)

Formal documentation:

- **Records activities**
- **Records events**
- **Registers accomplishments**
- **Records assignments**
- **Provides basis for After-Action Reports**

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ICS FORMS (cont'd)

Informal documentation:
- **Notes from responders**
- **Comments recorded regarding incident and stabilization efforts**
- **Preincident information**
- **Maps, photographs and videos**
- **Plans and diagrams**

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ICS FORM 201, INCIDENT BRIEFING

- **Provides IC with information about incident situation, strategic goals initiated, and resources assigned**
- **Assists in briefings for transfer of Command**
- **Serves as a permanent record of initial activities**
- **Contains a site-area sketch**

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ICS FORM 202, INCIDENT OBJECTIVES

- **Serves as cover sheet for the IAP.**
- **Lists general control objectives for incident in short, clear and concise statements.**
- **Current strategic goals may be different than overall incident objectives (long-term outcomes).**
  – Overall incident objective: stabilize incident, determine if appropriate to rehabilitate, and so on.
  – Current strategic goals may be to stop leak and contain product.

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ICS FORM 203, ORGANIZATION ASSIGNMENT LIST

- **Provides status of Units or resources currently assigned and names of personnel staffing each position**
- **Indicates person in charge of Unit assignment**
- **Identifies reporting relationships**
- **Adjusted as changes take place in resource levels or assignments**

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ICS FORM 204, ASSIGNMENT LIST

- **Informs Operations Section personnel of incident assignments**
- **Separate form used for each Division or Group**
- **Lists resources within Divisions/Groups**
- **Provides tactical objectives to be accomplished**
- **Identifies special assignments for single Units, safety issues and special precautions**

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ICS FORM 205, INCIDENT RADIO COMMUNICATIONS PLAN

- **Provides one place to identify and record radio frequencies to be used**
- **Identifies the function that each channel number is assigned, i.e., Command, tactical, support, etc.**
- **Helps improve multiagency communications**

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ICS FORM 206, MEDICAL PLAN

- **Provides information on the incident medical-aid stations, transportation services, primary hospitals to be used, and medical emergency procedures.**
- **Medical standby and transportation required by 29 CFR 1910.120(q)(3)(v)(i).**
- **Reviewed by Safety Officer.**
- **Information may be placed on ICS Form 204 as special instructions.**

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ICS FORM 208HM, SITE SAFETY AND CONTROL PLAN

- **Filled out by Safety Officer or Assistant Safety Officer**
- **Recommended by Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 (Appendix C)**
- **Enhances safety at operations**
- **Becomes a checklist to ensure risks associated with materials involved are considered**

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ICS FORM 214, UNIT/ACTIVITY LOG

- **Critical to prepare After-Action Reports.**
- **Records activities performed at incident.**
- **Assists in maintaining accountability.**
- **Each Unit Leader maintains an ICS Form 214 for his or her assigned activity.**
- **Provides time and description of each significant occurrence: assignment, injury, difficulties encountered, new information.**

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ICS FORM 215, OPERATIONAL PLANNING WORKSHEET

- **Records tactical assignments for each operational period**
- **Records resources available and/or resources needed to accomplish assignment**
- **Identifies location and time to report for assignment**
- **Copy provided to Logistics if transportation is required**

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ICS FORM 215A, INCIDENT ACTION PLAN SAFETY ANALYSIS

- **Identifies tactical assignment by Division or Group**
- **Identifies specific safety issues for the tactical assignment**
- **Records risk management considerations to minimize risks or exposures**
- **Prepared by Safety Officer**

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Slide 2-66

ICS FORM 220, AIR OPERATIONS SUMMARY

Identifies:

- **Air Operations Director**
- **Air Attack Supervisor**
- **Helicopter Coordinator**
- **Air Tanker Coordinator**
- **Location and assignment log**
- **Inventory of available or needed equipment**

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ICS FORM 225, INDIVIDUAL PERFORMANCE RATING

- **Used to determine if trainee should be advanced and certified for the position being trained for — getting red card punched.**
- **Form used for trainees working under the direction of an experienced supervisor.**

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ICS FORM 227, CLAIMS LOG

- **Form used to identify financial claim for incident**
- **Form captures:**
  - **Time**
  - **Claim**
  - **Property owner**
  - **Location of incident**
  - **Claim form attached**
  - **Investigation started**
  - **Status of property damage**

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ICS FORM 260-1, RESOURCE ORDER (FOR AIRCRAFT)

- **Form used to order air support resources**
- **Form identifies:**
  - **Type/Purpose of resource needed**
  - **Location needed**
  - **Geographical Information System (GIS) — latitude and longitude coordinates.**
  - **Date and time ordered**
  - **Aircraft assignment information**

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Activity 2.4
Fire and Explosion at Compressed Gas Facility

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Slide 2-84

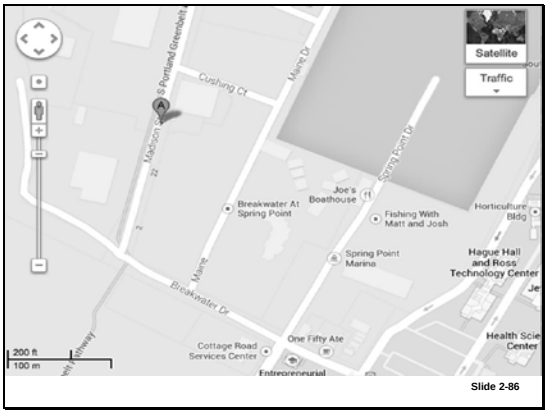


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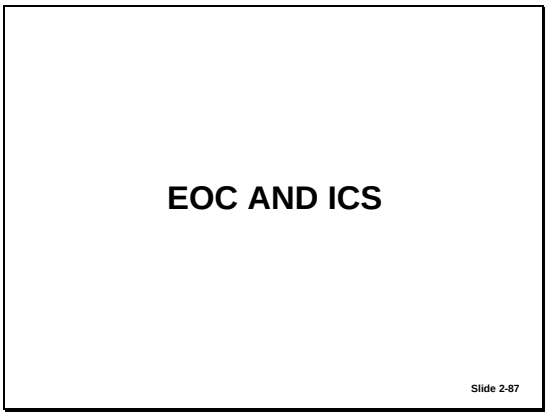
Slide 2-85



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EOC AND ICS (cont'd)

- **Role of EOC in hazmat/WMD incident**
- **Staffing EOC**
- **EOC functions**
- **Activating the EOC**
- **ICS/EOC interface**
- **Emergency management representative on-scene**

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Slide 2-89

MULTIAGENCY COORDINATION SYSTEM COMPONENTS

Policy-Level Decision-Makers (MAC Entity)

- **Consists of agency policy representatives with decision-making authority**
- **Prioritizes resource allocations**
- **Provides policy direction**

Implementing Staff

- **Consists of agency representatives with operational authority**
- **Implements multiagency coordination entity decisions**

Coordination Center

- **A location from which to operate**
- **May consist of permanent or temporary facilities including dispatch center, EOCs, etc.**

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LOCAL EOC'S ORGANIZATION

There is no standard method for organizing an EOC. Most local EOCs are organized using variations on three organizational approaches:

- **ICS-based**
- **Management function-based**
- **Emergency support function-based**

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JOINT INFORMATION SYSTEM

- **Provides an organized, integrated and coordinated mechanism to ensure the delivery of consistent information to the public in a crisis.**
- **Joint information activities are accomplished in a Joint Information Center (JIC) staffed by public information staff from all agencies with responsibility for the incident.**



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EOC/ICS INTERFACE ACTIVATION

- **Incident is complex**
- **Incident is a disaster or catastrophe**
- **If EOC gets activated — anticipate long-term response**

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Slide 2-93

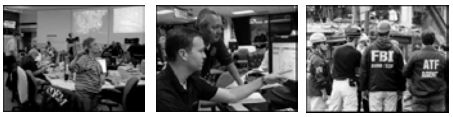
ICS AND EOC INTERFACE

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Slide 2-94

ACTIVATING THE MULTIAGENCY COORDINATION SYSTEM

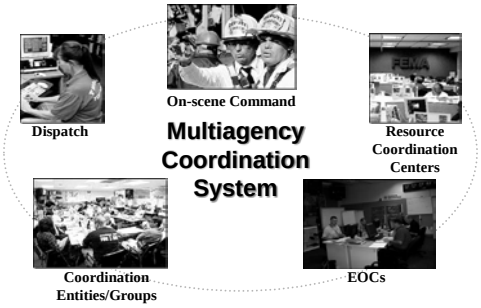
- **When an emergency situation threatens, significantly affects, or involves multiple agencies and/or political subdivisions**
- **When pre-established threat levels are reached**



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Slide 2-95

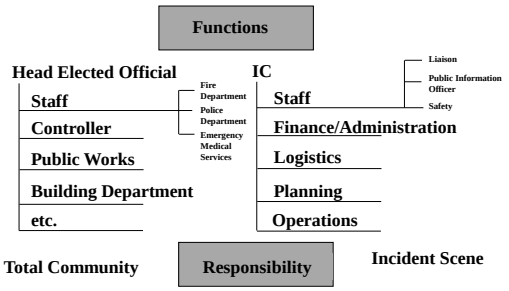
A SYSTEM — NOT A FACILITY



Slide 2-95

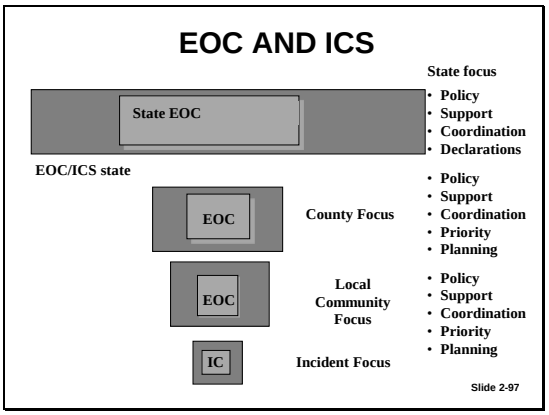
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EOC VERSUS COMMAND POST

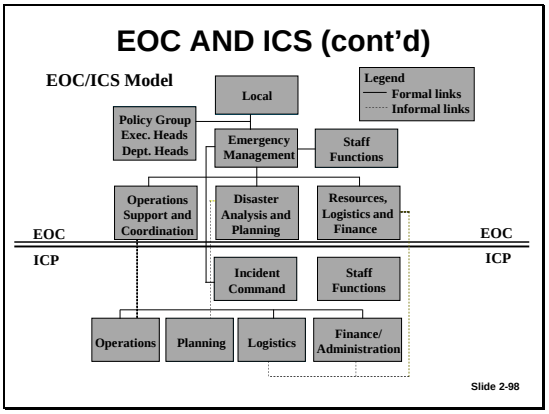


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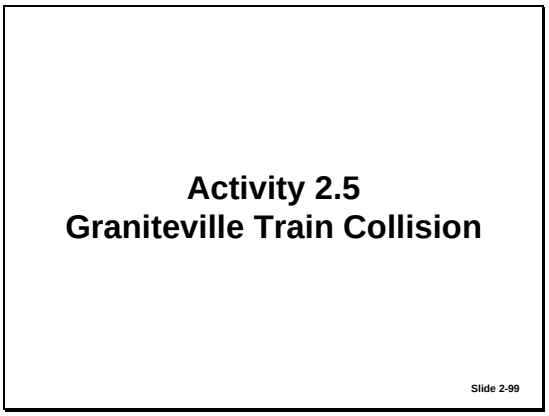
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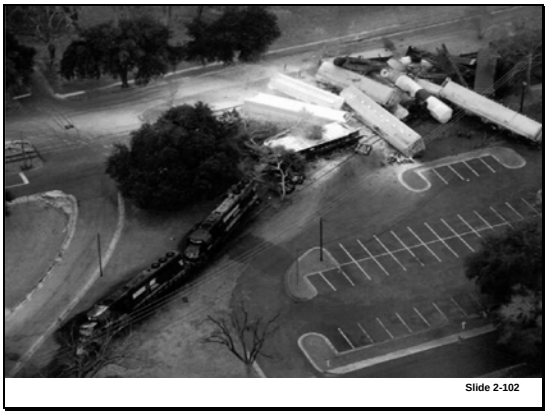
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SUMMARY

- **Single versus Unified Command**
- **ICS structure**
- **Planning "P"**
- **Transfer of Command**
- **Resources**
- **Goals/Objectives**
- **Hazmat Group/ Branch organization**
- **ICS Forms/Tactical Worksheet**
- **EOC**

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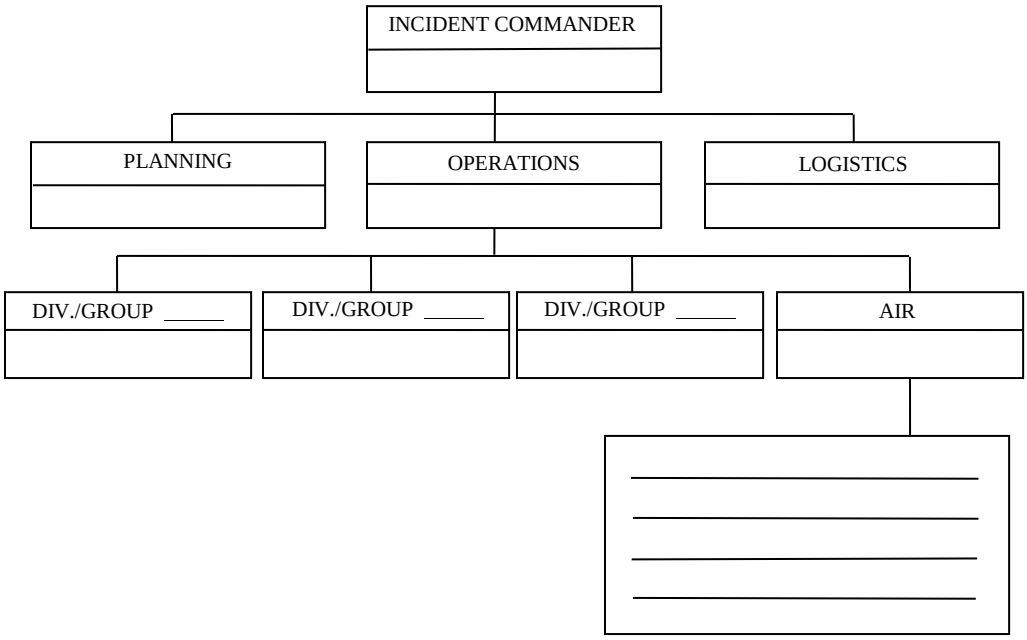
APPENDIX

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INCIDENT BRIEFING	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. MAP SKETCH			
ICS 201 (12/93) **NFES 1325**	PAGE 1	5. PREPARED BY (NAME AND POSITION)	

6. SUMMARY OF CURRENT ACTIONS		

7. CURRENT ORGANIZATION



ICS 201 (12/93) **NFES 1325**	PAGE 3	

8. RESOURCES SUMMARY				
RESOURCES ORDERED	**RESOURCES IDENTIFICATION**	**ETA**	**ON SCENE √**	**LOCATION/ASSIGNMENT**
ICS 201 (12/93) NFES 1325	PAGE 4			

INCIDENT OBJECTIVES	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED

4. OPERATIONAL PERIOD (DATE/TIME)

5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)

6. WEATHER FORECAST FOR OPERATIONAL PERIOD

7. GENERAL SAFETY MESSAGE

8. ATTACHMENTS (√ IF ATTACHED)

- ☐ ORGANIZATION LIST (ICS 203)
- ☐ MEDICAL PLAN (ICS 206)
- ☐ _____
- ☐ ASSIGNMENT LIST (ICS 204)
- ☐ INCIDENT MAP
- ☐ _____
- ☐ COMMUNICATIONS PLAN (ICS 205)
- ☐ TRAFFIC PLAN
- ☐ _____

202 ICS 3-80	9. PREPARED BY (PLANNING SECTION CHIEF)	10. APPROVED BY (INCIDENT COMMANDER)

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ORGANIZATION ASSIGNMENT LIST

1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED

4. OPERATIONAL PERIOD (DATE/TIME)

POSITION	NAME
5. INCIDENT COMMANDER AND STAFF	
INCIDENT COMMANDER	
DEPUTY	
SAFETY OFFICER	
PUBLIC INFORMATION OFFICER	
LIAISON OFFICER	
6. AGENCY REPRESENTATIVES	
AGENCY	**NAME**
7. PLANNING SECTION	
CHIEF	
DEPUTY	
RESOURCES UNIT	
SITUATION UNIT	
DOCUMENTATION UNIT	
DEMOBILIZATION UNIT	
TECHNICAL SPECIALISTS	
8. LOGISTICS SECTION	
CHIEF	
DEPUTY	
a. SUPPORT BRANCH	
DIRECTOR	
SUPPLY UNIT	
FACILITIES UNIT	
GROUND SUPPORT UNIT	
b. SERVICE BRANCH	
DIRECTOR	
COMMUNICATIONS UNIT	
MEDICAL UNIT	
FOOD UNIT	

9. OPERATIONS SECTION		
CHIEF		
DEPUTY		
a. BRANCH I - DIVISION/GROUPS		
BRANCH DIRECTOR		
DEPUTY		
DIVISION/GROUP		
DIVISION/GROUP		
DIVISION/GROUP		
DIVISION/GROUP		
DIVISION/GROUP		
b. BRANCH II - DIVISION/GROUPS		
BRANCH DIRECTOR		
DEPUTY		
DIVISION/GROUP		
DIVISION/GROUP		
DIVISION/GROUP		
DIVISION/GROUP		
DIVISION/GROUP		
c. BRANCH III - DIVISION/GROUPS		
BRANCH DIRECTOR		
DEPUTY		
DIVISION/GROUP		
DIVISION/GROUP		
DIVISION/GROUP		
DIVISION/GROUP		
DIVISION/GROUP		
d. AIR OPERATIONS BRANCH		
AIR OPERATIONS BR. DIR.		
AIR TACTICAL GROUP SUP.		
AIR SUPPORT GROUP SUP.		
HELICOPTER COORDINATOR		
AIR TANKER/FIXED-WING CRD.		
10. FINANCE/ADMINISTRATION SECTION		
CHIEF		
DEPUTY		
TIME UNIT		
PROCUREMENT UNIT		
COMPENSATION/CLAIMS UNIT		
COST UNIT		

203 **ICS** 1-82	11. PREPARED BY (RESOURCES UNIT)

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1. BRANCH	2. DIVISION/GROUP	**ASSIGNMENT LIST**

3. INCIDENT NAME	4. OPERATIONAL PERIOD Date _____ TIME _____

5. OPERATIONS PERSONNEL

OPERATIONS CHIEF _____ DIVISION/GROUP SUPERVISOR _____

BRANCH DIRECTOR _____ AIR TACTICAL GROUP SUPERVISOR _____

6. RESOURCES ASSIGNED THIS PERIOD

STRIKE TEAM/TASK FORCE RESOURCE DESIGNATOR	LEADER	NUMBER PERSONS	TRANS. NEEDED	DROP OFF PT/TIME	PICK-UP PT/TIME

7. CONTROL OPERATIONS

8. SPECIAL INSTRUCTIONS

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

FUNCTION		FREQ.	SYSTEM	CHAN.	FUNCTION		FREQ.	SYSTEM	CHAN.
COMMAND	LOCAL				SUPPORT	LOCAL			
	REPEAT					REPEAT			
DIV/GROUP TACTICAL					GROUND-TO-AIR				

10. PREPARED BY (RESOURCES UNIT)	11. APPROVED BY (PLANNING SECTION CHIEF)	DATE	TIME

ICS 204 1-82

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INCIDENT RADIO COMMUNICATIONS PLAN	1. INCIDENT NAME	2. DATE/TIME PREPARED	3. OPERATIONAL PERIOD DATE/TIME

4. BASIC RADIO CHANNEL UTILIZATION

SYSTEM/CACHE	CHANNEL	FUNCTION	FREQUENCY	ASSIGNMENT	REMARKS

ICS 205 9-86	5. PREPARED BY (COMMUNICATIONS UNIT)

NFES 1330

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MEDICAL PLAN	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED	4. OPERATIONAL PERIOD

5. INCIDENT MEDICAL AID STATIONS

MEDICAL AID STATIONS	LOCATION	PARAMEDICS	
		YES	NO

6. TRANSPORTATION

A. AMBULANCE SERVICES

NAME	ADDRESS	PHONE	PARAMEDICS	
			YES	NO

B. INCIDENT AMBULANCES

NAME	LOCATION	PARAMEDICS	
		YES	NO

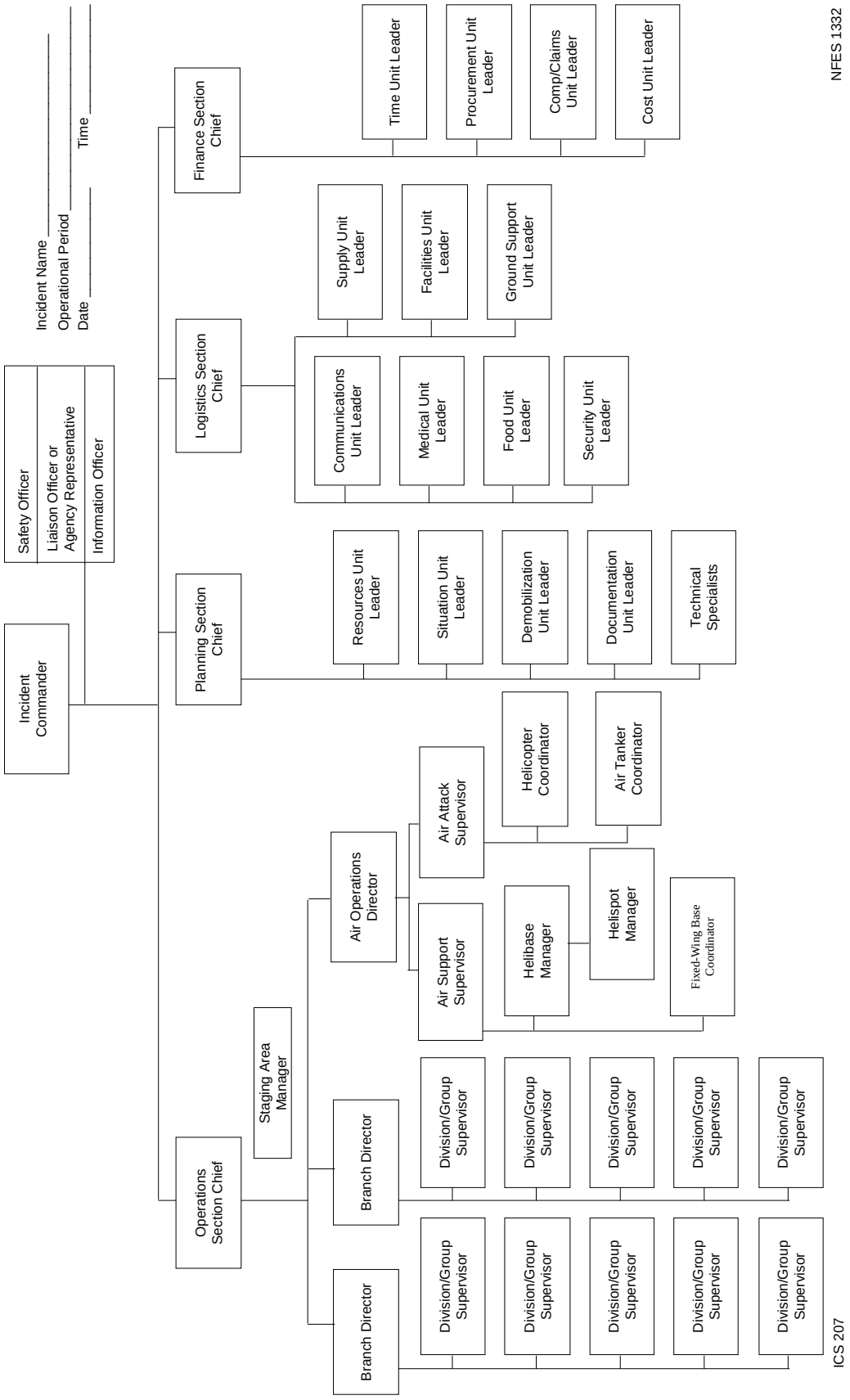
7. HOSPITALS

NAME	ADDRESS	TRAVEL TIME		PHONE	HELIPAD		BURN CENTER	
		AIR	GRND		YES	NO	YES	NO

8. MEDICAL EMERGENCY PROCEDURES

206 **ICS** 8-78	9. PREPARED BY (MEDICAL UNIT LEADER)	10. REVIEWED BY (SAFETY OFFICER)

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Incident Name _____
Operational Period _____ Time _____
Date _____
Safety Officer
Liaison Officer or Agency Representative
Information Officer
Incident Commander
Operations Section Chief
Staging Area Manager
Branch Director
Division/Group Supervisor
Division/Group Supervisor
Division/Group Supervisor
Division/Group Supervisor
Division/Group Supervisor
Branch Director
Division/Group Supervisor
Division/Group Supervisor
Division/Group Supervisor
Division/Group Supervisor
Division/Group Supervisor
Air Operations Director
Air Support Supervisor
Air Attack Supervisor
Helibase Manager
Helicopter Coordinator
Helispot Manager
Air Tanker Coordinator
Fixed-Wing Base Coordinator
Planning Section Chief
Resources Unit Leader
Situation Unit Leader
Demobilization Unit Leader
Documentation Unit Leader
Technical Specialists
Logistics Section Chief
Communications Unit Leader
Medical Unit Leader
Food Unit Leader
Security Unit Leader
Supply Unit Leader
Facilities Unit Leader
Ground Support Unit Leader
Finance Section Chief
Time Unit Leader
Procurement Unit Leader
Comp/Claims Unit Leader
Cost Unit Leader
ICS 207
NFES 1332

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SITE SAFETY AND CONTROL PLAN ICS 208 HM	1. Incident Name:	2. Date Prepared:	3. Operational Period Time

Section I. Site Information

4. Incident Location:

Section II. Organization

5. Incident Commander:	6. HM Group Supervisor:	7. Tech, Specialist — HM Reference:
8. Safety Officer:	9. Entry Leader:	10. Site Access Control Leader:
11. Asst. Safety Officer — HM:	12. Decontamination Leader:	13. Safe Refuge Area Mgr.
14. Environmental Health:	15.	16.

17. Entry Team: (Buddy System) Name:	PPE Level	18. Decontamination Element: Name:	PPE Level
Entry 1		Decon 1	
Entry 2		Decon 2	
Entry 3		Decon 3	
Entry 4		Decon 4	

Section III. Hazard/Risk Analysis

19. Material:	Container type	Qty.	Phys. State	pH	IDLH	F.P.	I.T.	V.P.	V.D.	S.G.	LEL	UEL

Comment:

Section IV. Hazard Monitoring

20. LEL Instrument(s):	21. O_2 Instrument(s):
22. Toxicity/PPM Instrument(s):	23. Radiological Instrument(s):

Comment:

Section V. Decontamination Procedures

24. Standard Decontamination Procedures:	YES:	NO:

Comment:

Section VI. Site Communications

25. Command Frequency:	26. Tactical Frequency:	27. Entry Frequency:

Section VII. Medical Assistance

28. Medical Monitoring:	YES:	NO:	29. Medical Treatment and Transport In-Place:	YES:	NO:

Comment:

Section VIII. Site Map

30. Site Map:



Weather ☐ Command Post ☐ Zones ☐ Assembly Areas ☐ Escape Routes ☐ Other ☐

Section IX. Entry Objectives

31. Entry Objectives:

Section X. SOPs and Safe Work Practices

32. Modifications to Documented SOPs or Work Practices:	YES:	NO:

Comment:

Section XI. Emergency Procedures

33. Emergency Procedures:

Section XII. Safety Briefing

34. Asst. Safety Officer — HM Signature:	Safety Briefing Completed (Time):
35. HM Group Supervisor Signature:	36. Incident Commander Signature:

INCIDENT STATUS SUMMARY
(*See reverse for general instructions*.)

1. Date	Time	2. INITIAL θ UPDATE θ FINAL θ	3. Incident Name (12)	4. Incident Number (8)

5. Incident Commander (12)	6. Jurisdictions (5)	7. County (14)	8. Type Incident (20)	9. Location (64)	10. Started Date _____ Time _____ (6/4)

11. Cause (28)	12. Area Involved (28)	13. % Contained (4)	14. Expected Containment Date Time (6/4)	15. Ext. Control Date _____ Time _____ (6/4)	16. Declared Controlled Date _____ Time _____ (6/4)

17. Current Threat (66)	18. Current Problems (64)

19. Est. Loss (12)	20. Est. Savings (12)	21. Injuries (4)	Deaths (4)	22. Line Built (6)	23. Line to Build (6)

24. Current Weather WS WD Temp RH (14)	25. Predicted Weather WS WD Temp RH (14)	26. Costs to Date (12)	27. Est. Total Cost (12)

	28. AGENCIES												**TOTALS**
29. RESOURCES (4)													
KIND OF RESOURCE	SR ST	SR ST	SR ST	SR ST	SR ST	SR ST	SR ST	SR ST	SR ST	SR ST	SR ST	SR ST	
ENGINES													
DOZERS													
CREWS													
HELICOPTERS													
AIR TANKERS													
TRUCK COS.													
RESCUE/MED.													
WATER TENDERS													
OTHER													
OVERHEAD PERSONNEL													
TOTAL PERSONNEL													

30. Cooperating Agencies (52)

31. Remarks (8 Lines/80)

32. Prepared By (12)	33. Approved By (12)	34. Sent To Date Time By

9/86 ICS 209

GENERAL INSTRUCTIONS

Completion of the Incident Status Summary will be as specified by agency or municipality. Report by telephone, teletype, computer or facsimile to the local agency or municipality headquarters by 2100 hours daily on incidents as required by agency or municipality. (Reports are normally required on life-threatening situations, real property threatened or destroyed, high resource damage potential, and complex incidents that could have political ramifications.) Normally, wildland agencies require a report on all Class D (100 acres plus) and larger incidents (unless primarily grass type in which case report Class E, 300 acres or larger). The first summary will cover the period from the start of the incident to 2100 hours the first day of the incident, if at least four hours have elapsed; thereafter, the summary will cover the 24-hour period ending at 1900 hours (This reporting time will enable compilation of reporting data and submission of report to local agency or municipality headquarters by 2100 hours.) daily until incident is under control. Wildland fire agencies will send the summary to the National Interagency Fire Center by 2400 hours Mountain Time.

1. Enter date and time report completed (mandatory).
2. Check appropriate space (mandatory — no computer entry).
3. Provide name given to incident by Incident Commander or agency (mandatory).
4. Enter number assigned to incident by agency (mandatory).
5. Enter first initial and last name of Incident Commander (optional).
6. Enter agency or municipality (mandatory).
7. Enter county where incident is occurring (optional).
8. Enter type incident, e.g., wildland fire (enter fuel type), structure fire, hazardous chemical spill (mandatory).
9. Enter legal description and general location. Use remarks for additional data if necessary (mandatory).
10. Enter date and Zulu time incident started (mandatory — maximum of six characters for date and four characters for time).
11. Enter specific cause or under investigation (mandatory).
12. Enter area involved, e.g., 50 acres, top three floors of building (mandatory).
13. Enter estimate of percent of containment (mandatory).
14. Enter estimate of date and time of total containment (mandatory).
15. Enter estimated date and time of control (mandatory).
16. Enter actual date and time fire was declared controlled (mandatory).
17. Report significant threat to structures, watershed, timber, wildlife habitat, or other valuable resources (mandatory).
18. Enter control problems, e.g., accessibility, fuels, rocky terrain, high winds, structures (mandatory).
19. Enter estimated dollar value of total damage to date. Include structures, watershed, timber, etc. Be specific in remarks (mandatory).
20. Enter estimate of values saved as result of all suppression efforts (optional).
21. Enter any serious injuries or deaths that have occurred since the last report. Be specific in remarks (mandatory).
22. Indicate the extent of line completed by chains or other units of measurement (optional).
23. Indicate line to be constructed by chains or other units of measurement (optional).
24. Indicate current weather conditions at the incident (mandatory).

25. Indicate predicted weather conditions for the next operational period (mandatory).
26. Provide total incident cost to date (optional).
27. Provide estimated total cost for entire incident (optional).
28. List agencies which have resources assigned to the incident (mandatory).
29. Enter resource information under appropriate agency column by single resource or Strike Team (mandatory).
30. List by name those agencies which are providing support, e.g., Salvation Army, Red Cross, law enforcement, National Weather Service (mandatory).
31. The Remarks space can be used to (1) list additional resources not covered in Section 28/29; (2) provide more information on location; (3) enter additional information regarding threat control problems, anticipated release, or demobilization, etc. (mandatory).
32. This will normally be the incident Situation Unit Leader (mandatory).
33. This will normally be the incident Planning Section Chief (mandatory).
34. The identification of the agency entering the report will be entered (optional — no computer entry).

For those areas using existing computer system, refer to user's manual.

Maximum number of characters allowed for each block are specified in parenthesis on front of form.

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INCIDENT CHECK-IN LIST	1. Incident Name	2. Check-In Location (complete all that apply)					3. Date/Time
Check one: ☐ Personnel ☐ Handcrew ☐ Misc. ☐ Engines ☐ Dozers ☐ Helicopters ☐ Aircraft		☐ Base	☐ Camp	☐ Staging Area	☐ ICP Restat	☐ Helibase	

Check-In Information

4. List Personnel (overhead) by Agency & Name -OR- List equipment by the following format: Agency	Single	Kind	Type	I.D. No/Name	5. Order/Request Number	6. Date/ Time Check-In	7. Leader's Name	8. Total No. Personnel	9. Manifest Yes	9. Manifest No	10. Crew or Individual's Weight	11. Home Base	12. Departure Point	13. Method of Travel	14. Incident Assignment	15. Other Qualifications	16. Sent to RESTAT Time/Int

Page 1 of	17. Prepared by (Name and Position) *Use back for remarks or comments*

ICS 211

NFES 1509

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*U.S. GPO: 1009-783-875

GENERAL MESSAGE

TO:	POSITION
FROM	POSITION
SUBJECT	DATE

MESSAGE:

DATE	TIME	SIGNATURE/POSITION

213 ICS 1/79
NFES 1336

PERSON RECEIVING GENERAL MESSAGE KEEP THIS COPY

SENDER REMOVE THIS COPY FOR YOUR FILES

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UNIT/ACTIVITY LOG	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. UNIT NAME/DESIGNATORS	5. UNIT LEADER (NAME AND POSITION)	6. OPERATIONAL PERIOD	

7. PERSONNEL ROSTER ASSIGNED		
NAME	ICS POSITION	HOME BASE

8. ACTIVITY LOG (CONTINUE ON REVERSE)	
TIME	MAJOR EVENTS

ICS 214

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OPERATIONAL PLANNING WORKSHEET

1. INCIDENT NAME	2. DATE PREPARED / TIME PREPARED	3. OPERATIONAL PERIOD (DATE/TIME)

4. DIVISION OR OTHER LOCATION	5. WORK ASSIGNMENTS	6. RESOURCES BY TYPE (SHOW STRIKE TEAM AS ST) — RESOURCE / TYPE																										7. REPORTING LOCATION	8. REQUESTED ARRIVAL TIME
		REQ																											
		HAVE																											
		NEED																											
		REQ																											
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		HAVE																											
		NEED																											

9. TOTAL RESOURCES REQUIRED	SINGLE RESOURCES / STRIKE TEAMS	10. PREPARED BY (NAME AND POSITION)
TOTAL RESOURCES ON HAND		
TOTAL RESOURCES NEEDED		

215 ICS 9-66

NFES 1338

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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)

ICS 215A

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AIR OPERATIONS SUMMARY

1. INCIDENT NAME	2. OPERATIONAL PERIOD (Date & Time)	3. DISTRIBUTION HELIBASES _____ FIXED-WING BASES _____

4. PERSONNEL AND COMMUNICATIONS

	NAME	AIR/AIR FREQUENCY	AIR/GROUND FREQUENCY
AIR OPERATIONS BRANCH DIRECTOR			
AIR TACTICAL GROUP SUPERVISOR			
HELICOPTER COORDINATOR			
AIR TANKER/FIXED-WING COORDINATOR			

5. REMARKS (Spec. Instructions, Safety Notes, Hazards, Priorities)

6. LOCATION/ FUNCTION	7. ASSIGNMENT	8. FIXED-WING NO.	8. FIXED-WING TYPE	9. HELICOPTERS NO.	9. HELICOPTERS TYPE	10. TIME AVAILABLE	10. TIME COMMENCE	11. AIRCRAFT ASSIGNED	12. OPERATING BASE
13. TOTALS									

220 ICS 1-82	14. AIR OPERATIONS SUPPORT EQUIPMENT	15. PREPARED BY (Include Date & Time)

NFES 1351

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INDIVIDUAL PERFORMANCE RATING

INSTRUCTIONS: The immediate supervisor will prepare this form for a subordinate person. Rating will be reviewed with the individual who will sign and date the form. The completed rating will be given to the Planning Section Chief before the rater leaves the incident.

1. NAME

2. INCIDENT NAME AND NUMBER — START DATE OF INCIDENT

3. HOME UNIT ADDRESS

4. INCIDENT AGENCY AND ADDRESS

5. POSITION HELD ON INCIDENT

6. TRAINEE POSITION ☐ YES ☐ NO

7. INCIDENT COMPLEXITY ☐ I ☐ II ☐ III

8. DATE OF ASSIGNMENT FROM: TO:

9. List the main duties from the Position Checklist, on which the position will be rated.

Enter X under the appropriate column indicating the individuals level of performance for each duty listed.

	PERFORMANCE LEVEL				
	Did not apply on this incident	Unacceptable	Need to Improve	Fully Successful	Exceeds Successful
	EXPLAIN IN REMARKS				

10. REMARKS

11. THIS RATING HAS BEEN DISCUSSED WITH ME (Signature of individual being rated.) — 12. DATE

13. RATED BY (Signature) — 14. HOME UNIT — 15. POSITION HELD ON THIS INCIDENT — 16. DATE

*U.S. GPO: 1991-594-696/40141

NFES 2074 ICS FORM 226 (6/89)

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CLAIMS LOG
(See reverse side for instructions)

1. Incident _____ 2. Date _____ 3. Operational Period _____

4. Time	5. Claim	6. Property Owner	7. Location on Incident	8. Claims Form Initiated	9. Agency Reps Advised	10. Property Owner Contacted	11. Investi-gation Started	12. Claims Form Completed	13. Status

ICS Form 227 12/88

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RESOURCE ORDER

INCIDENT/PROJECT ORDER NUMBER

1. INITIAL DATE/TIME	2. INCIDENT/PROJECT NAME	3. INCIDENT /PROJECT ORDER NUMBER	4. OFFICE REFERENCE NUMBER

5. DESCRIPTIVE LOCATION/RESPONSE AREA	6. SEC.	TWN	RNG	Base MDM	8. INCIDENT BASE/PHONE NUMBER	9. JURISDICTION/AGENCY
	7. MAP REFERENCE					10. ORDERING OFFICE

11. AIRCRAFT INFORMATION			LAT.		LONG.			
BEARING	DISTANCE	BASE OR OMNI	AIR CONTACT	FREQUENCY	Ground Contact	FREQUENCY	RELOAD BASE	OTHER AIRCRAFT/HAZARDS

12. Request Number	Ordered Date/Time	From / To	Q T Y	RESOURCE REQUESTED	Needed Date/Time	Deliver To	To / From	Time	Agency ID	RESOURCE ASSIGNED	ETD / ETA	RELEASED Date	RELEASED To	Time / ETA

13. ORDER RELAYED Req. No.	Date	Time	To/From	ACTION TAKEN	ORDER RELAYED Req. No.	Date	Time	To/From	ACTION TAKEN

ICS 260-1 (7/87) NFES1470

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UNIT 3: DECISION-MAKING

TERMINAL OBJECTIVE

The students will be able to define the use of classical and recognition-primed decision-making in the determination of appropriate incident objectives, strategies and tactics.

ENABLING OBJECTIVES

The students will:

1. *Identify at least one linear decision-making model.*

2. *Identify at least one nonlinear decision-making model.*

3. *Identify the six model incident objectives for a hazardous materials/weapons of mass destruction (hazmat/WMD) incident.*

4. *For a simulated hazmat/WMD incident, implement appropriate incident objectives.*

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DECISION-MAKING DURING A HAZARDOUS MATERIALS INCIDENT

Hazardous materials (hazmat) response has historically been procedure-based. This means that the actions of responders were tightly driven by standard operating procedures/standard operating guidelines (SOPs/SOGs). In the 1980s, emergency responders faced the new challenge of hazmat. Lacking significant experience in hazmat response, a classical decision-making model was adopted by many agencies**.** The model included gathering all the information you can, estimating all the possible outcomes, listing all the options, assessing which option is best, and then implementing the best option. In many cases, the result was "paralysis by analysis." These classical decision-making models proved problematic when faced with uncontrolled situations that required immediate action. In the 1990s, as response agencies gained more experience, hazard-based response and risk-based decision-making became more prevalent. The threat of terrorism has forced responders to adopt a risk assessment model to address the additional challenges presented by intentional events. To summarize, hazardous materials/weapons of mass destruction (hazmat/WMD) events require hazard-based response and risk-based decision-making as key components to an overall risk assessment.

Risk assessment has been described as the study of vulnerabilities, threats, likelihood and consequences. It is also one of the first steps in the risk management process.

As stated previously, the concept of risk-based response is gaining momentum in the hazmat response arena. Risk-based decision-making is a systematic process by which responders analyze a problem involving hazmat/WMD, assess the hazards, evaluate the risk, and determine appropriate response actions based on fact, science and the circumstances of the incident. The experience of the responders is another key component of the process. Risk-based response increases the flexibility with which trained, knowledgeable and experienced responders can operate. As the experience and knowledge increases, so does the efficiency of risk-based response. Continued sharing of smart practices and lessons learned will help develop the use of risk-based response.

The recognition-primed decision-making model is a contrast to classical decision-making models. Classical decision-making is very viable when time is not a critical factor because it includes a step-by-step process that can be mapped and flow-charted for anyone to follow. Rick Klein has written extensively on recognition-primed decision-making in his study of emergency responders. Klein's research supports the hypotheses that, in the emergency responder world, the classical decision-making model does not work.

Klein's book provides evidence that experience is a primary factor in effective decision-making and is required for emergency response. The evidence that stress actually may enhance decision-making is one of Klein's most significant findings. In addition, the reading provides evidence that critical decision-making has an innate component. I would assume each of us can think of someone, despite training and experience, who is a poor decision-maker under pressure. The same individual can make good decisions in less stressful situations.

Twenty years of hazmat response has provided a base of experience, which can be referenced in hazmat/WMD response. Klein's recognition-primed decision-making, also known as recognition-based decision-making by some agencies, is required for hazmat/WMD emergency response. National standards for hazmat/WMD response are beginning to reference hazard-based response and risk-based decision-making as the new standard.

The decision facing the emergency responder is which model to use under what set of circumstances. To assist with that decision, each model will be discussed, and the pros and cons of each model will be discussed in detail.

Classical Decision-Making Models

There are several classical decision-making models. Again, these models use an analytical process that is procedurally based or follows a step-by-step process. This process relies on gathering the information on the problem, facts and opinions of what is happening, and determining what options are available. Once the best option is chosen, that option is implemented as a course of action. The models that have been used in emergency response to hazmat incidents include: Detect, Estimate, Choose, Identify, Do and Evaluate (DECIDE) and **G**ather information, **E**stimate potential course and harm, **D**etermine strategic goals, **A**ssess tactical options and resources, **P**lan and implement actions decided upon, **E**valuate the action plan, and **R**eview strategic goals (GEDAPER).

NFPA 472 (2008 EDITION) RECOMMENDATIONS FOR HAZMAT/WMD RESPONSES

Risk-Based Response

Risk-based response is a systematic process by which responders analyze a problem involving hazmat/WMD; assess the hazards; evaluate the risks; and determine appropriate response actions based on facts, science and the circumstances of the incident.

Risk Assessment

To use the risk-based response model effectively, the responder first must conduct a risk assessment considering the following factors:

- Threat/Hazard.
- Vulnerability.
- Consequences.
- Likelihood.

Hazard

In the first step, the responder must identify what hazards exist. This requires that the responder look at what hazards may be present at a hazmat/WMD event. The hazards may include the chemical, biological, radiological, nuclear and explosive (CBRNE) hazards.

- **Chemical** — in hazmat/WMD response, the responder must gather information regarding the chemical and physical properties of the chemical and how it harms humans, animals and the environment. When discussing chemical weapons, the military identifies chemical hazards by dividing them into categories of harm to the body. The military classifications include:

  - Nerve agents — chemicals that affect the nervous system. The most common such chemicals are organophosphates and carbamates.

  - Blister agents — although some industrial chemicals attack the skin, most blister agents are thought of as military warfare agents. This includes the mustards, a British warfare agent called Lewisite, and phosgene oxime. They work through damaging the skin, causing blisters, and have other toxic effects on the body as well.

  - Blood agents — chemicals that bind or affect blood components or the ability of the blood to carry oxygen. Sometimes called chemical asphyxiants. Examples include cyanide gases and arsine.

  - Choking agents — these chemicals are actually respiratory irritants. The chemicals are used widely in industry and are products that include chlorine, phosgene and ammonia. They inflict damage on the respiratory tract by tissue destruction and causing noncardiogenic pulmonary edema.

  - Incapacitating agents — chemicals that are used primarily to control crowds and opposing troops without long-term effects. The most common are called riot control agents; examples of the products include Mace® and tear gas.

- **Biological** — includes micro-organisms like bacteria and viruses, as well as chemical byproducts that are produced by living organisms that are called toxins.

- **Radiological** — the radiological hazard comes from materials that release ionizing radiation in the form of alpha and beta particles, energy in the form of gamma and X-rays, and neutrons.

- **Nuclear** — the hazards from a nuclear device include radiation as well as thermal and mechanical harm. Such a device may be a nuclear bomb or an operating nuclear reactor.

- **Explosive** — as a WMD, the use of explosives is the most common. Greater than 70 percent of WMD incidents use explosive devices as the weapon. Explosive devices are made using energetic chemicals that release tremendous amounts of energy when activated.

When looking at each of the listed hazards, the responder must consider the following factors regarding the hazard:

- Product — any substance involved in the incident.
- Container — any object that acts to hold the product in an intended location.
- Environment — anything that surrounds the product and the container. This may include the atmosphere, conduits that may transfer the product, and the geology of the area.
- Cause — what caused the incident to occur. The cause may be negligence, illicit activities or intentional.

Vulnerability

The next step in determining risk is determining vulnerability to the hazard. When assessing vulnerability to a hazard, one must consider the mechanisms of harm. They are TRACEME:

- **T**hermal — thermal injuries can come from many sources, including heat from a blast or fire, and cold from cryogenic hazardous materials or endothermic reactions.
- **R**adiological — all life forms are vulnerable to ionizing radiation in large doses. Most responders are familiar with the forms of ionizing radiation including alpha, beta, gamma and neutron.
- **A**sphyxiation — the displacement or exclusion of oxygen denies the human body needed oxygen to survive. There are several causes, including the simple displacement of oxygen by another gas or the chemical interference with oxygen getting to the cells in the body.
- **C**hemical — many chemicals have a toxicological effect on the body. Many of these chemicals we recognize as poisons; however, most chemicals can be toxic to humans, given a large enough exposure or dose.
- **E**tiological — exposure to disease-causing organisms and materials are another mechanism of harm to humans. Most responders have been trained in bloodborne pathogens and body substance isolation procedures for protection against etiological hazards.
- **M**echanical — mechanical hazards always pose a threat to emergency responders and include operating machinery, traffic, explosions and threat of collapse of damaged buildings.
- **E**lectrical — electrical hazards are present in damaged buildings or other emergency sites. Such hazards are similar to radiation hazards in that you cannot see, taste, or smell them, and the first indication comes after the exposure.

When the responder understands the mechanisms of harm, the next step is to understand the protective measures that can be taken to reduce the vulnerability to the harm:

- Time — limiting time in a hazardous area will limit the exposure to the hazard. This works for virtually all hazards, including exposure to chemicals and radiation and exposure to mechanical hazards, like being on a highway with moving traffic.

- Distance — the greater the distance from the hazard, the less likely the exposure of the responder to the mechanism of harm.

- Shielding — many times responders think of shielding as wearing personal protective equipment (PPE). However, it may also include shielding behind buildings, heavy equipment, or other large objects to prevent mechanical harm.

- Detection — finally, detection is a critical element for the hazmat/WMD technician. It is hard to imagine a mechanism of harm if the responder cannot identify that the hazard is present. Detection can come in many forms, including monitoring instruments, colormetric devices or simply physical lookouts. The ability to use and understand the many types of monitoring devices effectively is one of the critical elements that separate the technician from the responders. Using and understanding monitoring equipment is one of the most challenging skills for the hazmat/WMD technician.

Consequences

The third step in the risk assessment process is to evaluate the consequences. If there is an exposure to a hazard and the responder is vulnerable to the hazard, the responder has to determine what the consequences of the exposure will be. Consequences are rated as severe, moderate or low.

Likelihood

The final component is that of the likelihood or probability of the occurrence. This is a somewhat subjective judgment on the part of the responder, and is based on the experience of the decision-maker.

Initial Versus Detailed Risk Assessment

As there are two models of decision-making, there also are two models of risk assessment. Some decision-making processes must be completed quickly at the emergency scene. In the initial risk assessment, a quick sizeup of the hazards present will allow the responders to make rapid decisions and develop a course of action. As stated earlier, this requires knowledge of the hazards and the experience of previous events. Successful initial risk assessments rely heavily upon recognition-primed decision-making and a rapid assessment of the essential basic information elements of the event.

A detailed risk assessment should always be conducted as more information becomes available. The detailed assessment is done in greater depth and requires evaluation of all of the available data. Once it is completed, the initial risk management plan is revised. Just like the other elements of a hazmat/WMD event, the detailed risk assessment should be ongoing throughout the incident, and the risk management plan should be up for constant revision as more information and details regarding the hazards are obtained.

Information Basics

Much of the information gathered in the risk assessment process is obtained through the assessment of physical data. Most emergency responders are trained to conduct a rapid sizeup of the situation through the exposure of the physical data to the senses. It is what they see, hear, smell and feel as they arrive at the incident. Hazmat/WMD responders also may have the availability of instrumentation to assist in the assessment of the hazards. This includes instruments to monitor the atmosphere and computers to generate predictions of the movement of vapor clouds and other hazardous atmospheres. Instrumentation also helps the responder to detect things that cannot be seen, including chemicals, electricity or even radiation.

Technical data is the information that is gained through referring to reference materials, computer databases or even technical experts. Gathering technical data is time consuming and can be overwhelming.

The last step in information gathering is cognitive data. These data are derived from training and experience that is stored in the brain. This requires that the information gathered through the senses is analyzed, interpreted and extrapolated. The cognitive data interpretation and skills is what separates the hazmat/WMD technician from the specialist.

THE GEDAPER[1] PROCESS

The GEDAPER process is the classical decision-making model used in this course. It also may help determine whether or not a standard of care is being provided. GEDAPER is a mnemonic device, representing these concepts:

Gather information.
Estimate potential course and harm.
Determine strategic goals.
Assess tactical options and resources.
Plan and implement actions decided upon.
Evaluate the action plan.
Review strategic goals.

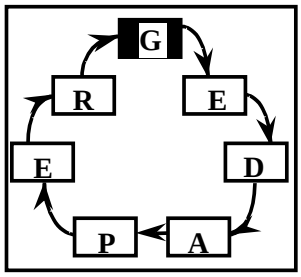
[1] "GEDAPER" is a decision-making model, similar to many found in the fire service. It was accepted by the National Fire Academy (NFA) for this and other programs as **one example** of a decision model that might be used for hazmat incidents.

GEDAPER was derived from concepts first elaborated upon in texts of the 1960s. David M. Lesak has developed and copyrighted the concept he published in a series of articles in "Fire Engineering" between June and November 1989.

By using it in this course, the NFA is not endorsing GEDAPER to the exclusion of other similar systems.

Before continuing with GEDAPER's relationship to the standard of care, we need to talk about a related concept — the incident management triangle. This concept has the Incident Commander (IC) as the primary decision-maker. The IC uses an Incident Command System (ICS) to track and control the personnel and equipment resources available. To accomplish a mission safely and efficiently with the available resources, the IC must determine the present and potential extent of an incident. By evaluating the elements of a hazmat situation in much the same way a traditional size-up occurs at a fire, the IC at a hazmat incident can achieve the same results: make safe and sound strategic and tactical decisions. It is at such times that a process model like GEDAPER can pay off.

Step 1: Gather Information



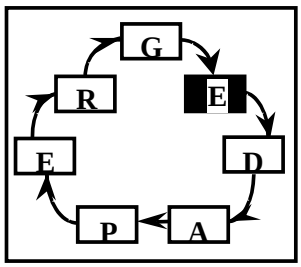
Gathering information is one of the most critical steps in the entire operational, decision-making and management process, because all subsequent steps in the process depend on gathered data. Without this information, the IC will be unable to develop satisfactory strategic goals and tactical objectives. If the IC has insufficient or incorrect information, or if the IC misinterprets information, subsequent strategic goals and tactical objectives may well be inappropriate, ineffective or downright lethal.

Incident Components

If the incident is of any magnitude or complexity, responders may face a substantial influx of physical and technical data in a very short period of time. In fact, so much information may confront officers at once that it becomes difficult to determine what is or is not essential. At this point it is very helpful to break the incident into components.

Most incidents have four components. To manage a hazmat/WMD incident requires information about the **product,** the **environment,** the **container** and the **cause** of the incident. These components, of course, are not completely separate and independent. On the contrary, the components all interact with each other. However, for the purpose of information gathering, it is very useful to separate them and examine each component separately.

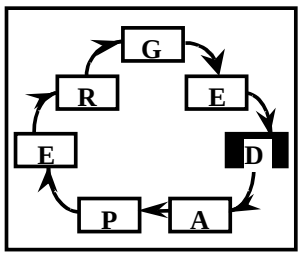
Step 2: Estimate Potential Course and Harm



After gathering data, the IC must make a series of predictions on the anticipated course of various aspects of the incident. If the IC does not do this, he or she will be in the unenviable position of playing catch-up in a critical incident situation. In effect, the incident then would be managing the response. This could lead to disastrous results if the IC does not request sufficient resources in time or does not take into consideration the setup time and other needed actions for tactical operations. The predictions should include, at a minimum, the following:

- Magnitude of the incident.
- Spread of the fire or hazardous material.
- Life hazard.
- Mode of operation (offensive, defensive or nonintervention).
- Impact on exposures (including environment).
- Safety factors and considerations.

Step 3. Determine the Incident Objectives



Incident Priorities

Life Safety

The first priority in an incident is to protect life, including the lives of responders, all who might be affected should the problem get out of hand (bystanders), and the civilian victims in the area of the incident.

While protection of life is always the number one priority in hazmat incidents, it is not identified here as an incident objective. There are several reasons. Most hazmat response teams arrive after first responders are in operation. If first responders have attempted rescue, they themselves may have been contaminated or overcome. Rescue must take place only with the proper PPE and training. The same holds true in confined-space rescue. Remember that 60 percent of the casualties in confined-space rescue are the responders themselves. For an IC to commit staff to rescue without proper training and PPE is to fail to protect life (an incident priority) of the responders.

Just as in a fire situation, there are three basic questions to ask in a rescue, all based on risk. First, is the risk minimal to response personnel? If so, rescue is a possibility. Second, is the risk to response personnel equal to the possibility of attempting the rescue? That is a Command decision made after assessing the entire situation. Third, is the risk to response personnel greater than the possibility of rescue?

Attempting a rescue is always a difficult decision, and the IC will always be second-guessed. Certainly, the firefighters will wish to at least attempt the rescue, but the possibility of additional casualties should outweigh the desire to attempt the rescue.

Incident Stabilization and Property Conservation

The second incident priority is incident stabilization. The third incident priority is to protect property and the environment. The second and third priorities may occur in any order, or simultaneously.

Only in recent years has the status of incident priority extended to the protection of the environment and the lives of responders. The increasing interest in protecting the environment occurred because of an emerging public awareness of the condition and vulnerability of the world. The concept of extending the lives of emergency responders seemed to evolve as slowly.

All emergency response agencies have the same basic priorities: life safety, incident stabilization, and the protection of both property and the environment. These priorities are etched in stone, with life safety always the most important. The safety of responders is the top priority.

Incident priorities help the emergency responder make decisions. They are a statement of policy that provides direction, sets parameters and says emphatically which circumstance is to take precedence over another during an emergency. They are a foundation upon which subsequent actions are built. Their order of importance must be as much second nature to first responders as is breathing.

DETERMINING INCIDENT OBJECTIVES, GOALS AND TACTICS

As the IC, you will need to develop appropriate incident objectives, strategic goals and assign tactical objectives. These decisions will be based on incident priorities which are typically life safety, incident stabilization and property conservation. As a minimum, you will need information about the product, container, environment and cause of the incident before appropriate actions can be initiated.

Some incidents may be recognized as long-term and will most likely require multiple operational periods. Most incidents, however, will be handled as a local level incident with first responders at hand. For long-duration incidents, the overall incident objectives may be different than the current operational period's strategic goals. During the next operational period, the strategic goals may change, as well working toward the overall incident objectives.

For the majority of incidents with hazardous materials involved that you will command, the incident objectives and strategic goals will be the same. The strategic goals for a hazardous materials incident typically include, as a minimum, isolation, notification, identification, protection, spill control, leak control, fire control and termination. For incidents that may have criminal intent, crime scene preservation also must be considered.

Incident objectives are broad in scope and are statements of what is expected to be accomplished in order to stabilize the incident and return the area to normal. This typically will be the strategic goals listed previously. At major long-term incidents, they also will be broadly based in nature but may not be as specific as isolation, notification and so on.

Strategic goals are broad in scope and statements of what is expected to be accomplished, typically in a specific order of accomplishment. Strategic goals may provide for the establishment of appropriate isolation of the incident: Extinguish the fire, stop the leak, contain the spill, and terminate the incident. The strategic goals do not include the tactics needed to accomplish the goal. In fire suppression, one strategic goal often is "rescue and remove the occupants safely." The tactical objective may be for a rescue team to conduct a primary search. Another tactical objective may involve fire confinement, ventilation, scene lighting and so on. All the tactical objectives are geared toward the accomplishment of the strategic goal of "rescue and remove the occupants safely."

Tactical objectives are specific, measurable and define what is to happen, who is to do it and any conditions associated with the assignment. For a spilled product, the typical tactical objective to accomplish the strategic goal of spill control would be for the spill control team to construct an underflow dam 100 feet downstream of the spill within 30 minutes wearing PPE and self-contained breathing apparatus (SCBA) while staying out of the product. Tactical objectives often will describe (A) audience, (B) behavior expected, (C) any conditions associated with the assignment, and (D) to what degree, such as time.

Tasks or methods are the procedures that the responders will employ to accomplish their tactical objective. As an example, with the underflow dam assignment, they will use pipes at the bottom of the ditch, sand or soil to fill the ditch above the pipe and some type of control method

on the pipes to control the flow and allow for the product to rise above the pipe and water beneath the product to flow from the pipe.

Following are brief descriptions of several hazmat incident objectives/strategic goals, tactical objectives and tasks or methods to accomplish the mission.

1. Incident objective/Strategic goal — isolate the incident scene to provide for civilian and responder safety.

   Tactical objective — Isolation Group, in accordance with the recommendations of the Department of Transportation (DOT)-North American Emergency Response Guidebook (NAERG), establish incident zones, and initiate evacuation procedures for the appropriate distances while wearing full PPE and SCBA within 30 minutes.

   Tasks or methods — Isolation Group will use barrier tape to mark the outer perimeter of the Warm Zone within 30 minutes, use their public-address (PA) system on the apparatus to initiate an initial evacuation, and work with the IC and Site Access Control Leader to restrict entry into the incident scene.

   The incident objective or strategic goal defined a broad-based outcome. The tactical objective was clear, concise, measureable, specific and accomplishable with the resources available and assigned. Can you identify the A, B, C and D elements?

   Audience: Isolation Group.
   Behavior: Use DOT-NAERG to determine isolation zone, initiate evacuation procedures.
   Conditions: Wearing PPE and SCBA.
   Degree: 30 minutes.

2. Incident objective/Strategic goal — eliminate ignition sources from the area containing the overturned vehicle and spilled product.

   Tactical objective — the Vapor Control Group will use the appropriate agent or material to provide a surface covering of the flammable liquid leaking from the container, as well as the container itself, within 10 minutes and maintain the blanket while wearing full PPE and SCBA from the upwind side of the incident.

   Tasks or methods — using a class “A” foam application device from Engine 1, apply a foam blanket over the product and container. Apply as often as needed to maintain the blanket foam.

   The incident objective or strategic goal defined a broad-based outcome. The tactical objective was clear, concise, measureable, specific and accomplishable with the resources available and assigned. Can you identify the A, B, C and D elements?

   Audience: Vapor Control Group.
   Behavior: Apply foam blanket over product and container and maintain it.

Conditions: Wear full PPE and SCBA; work from upwind direction.
Degree: 10 minutes.

3. Incident objective — isolate the incident scene and evacuate a 20-block area.

   Strategic goal — for this operational period, the responders will evacuate the 10 blocks adjacent to the incident scene including Memorial Hospital.

   Tactical objective — the Evacuation Branch, within the next six hours, will evacuate Memorial Hospital and 10-block area surrounding the incident scene, sending the evacuees to the shelter at the NG Armory, while wearing PPE and SCBA. A list will be developed for each address as to the status of the evacuation notification.

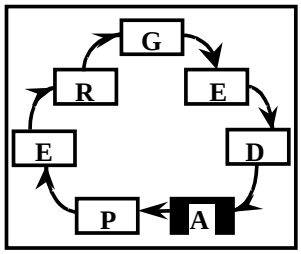
   Task or methods — four Evacuation Groups from the Evacuation Branch will be assigned to Divisions A, B, C and D going door-to-door directing the evacuation. Each group will be given a portable PA system, ID tags to be placed on exterior door of buildings checked and/or occupants notified. Groups 5, 6 and 7 from the Evacuation Branch will be assigned to assist with the evacuation of Memorial Hospital working under the direction of the facility medical director.

   The overall incident objective is to evacuate a 20-block area adjacent to the incident. The strategic goal for this operational period defined a broad based outcome for the evacuation of 10 blocks and a hospital. The tactical objective was clear, concise, measurable, specific and accomplishable with the resources available and assigned. Due to the complexity of this tactical objective an Evacuation Branch was created with seven groups assigned to the branch director. Can you identify the A, B, C and D elements?

   Audience: Evacuation Branch — seven groups.
   Behavior: Evacuate 10-block area and hospital and develop a list by address of actions taken at each location.
   Conditions: Wearing PPE and SCBA.
   Degree: Six hours.

Termination includes both the field administrative functions needed to restore operations to their normal status. This can include operational recovery issues, such as replenishing supplies, while administrative issues typically include debriefing, holding a critique, and following up on areas where improvement can be made. The critique is required by 29 Code of Federal Regulations (CFR) 1910.120 (q)(2) Employers Emergency Response Plan. As part of the critique, it is critical that all responders are provided with the health signs and symptoms associated with the materials involved. This information can be gained from Material Safety Data Sheets (MSDS), local health officials, computer databases or other technical references. A good source for this information is the Chemical Transportation Emergency Center (CHEMTREC). Incidents and After-Action Reports for the incident are critical to document what happened, what actions we took, who was assigned the tasks, and critical observations made during the response. If you are assigned to prepare an After-Action Report, it is important that you gather all records, tapes, and incident data as early after the incident as possible. If the responders used forms to record their actions, such as the ICS forms, they will be a valuable asset for your task.

Step 4: Assess Tactical Options and Resources



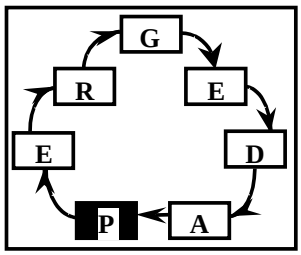
Once the IC has chosen appropriate incident objectives for a particular incident, the specific strategies and tactics to meet those objectives become more apparent. Additionally, the resources needed to accomplish any of the specific tactics become evident. If resources are insufficient to accomplish a specific strategy, the IC must be able to acquire those resources, in a timely way, or must choose another strategy.

For example, during a wildland fire in a mature stand of mixed pine and fir, the IC may determine that confinement is one of the incident objectives. One of the possible strategies to achieve the goal of confinement is to cut a firebreak along a ridge using a bulldozer. The estimate is that the fire will reach the ridge in about 2 1/2 hours, if conditions don't change. The IC learns that the closest available bulldozer will take two hours to reach the ridge and require another 45 minutes to cut the break. In such a case, it is necessary to choose an alternative strategy.

Examine possible strategies for the six generally accepted hazmat incident objectives, and explore methods and resources to accomplish each objective. It is important to repeat that the order in which the goals and the objectives occur does not represent priority. In fact, multiple goals and objectives may exist simultaneously.

There are various possible tactical objectives for each of the six incident objectives. Again, the six goals are isolation, notification, identification, protection, control and termination.

Step 5: Plan and Implement Actions



As appropriate tactical options emerge as attainable, an Incident Action Plan (IAP) starts to develop. At a minimum, the IAP must contain the following 11 elements.

1. Hazard and Risk Assessments.
2. Strategic Goals.
3. Tactical Objectives.
4. Control Objectives.
5. Assignments.
6. General Safety Messages.
7. Weather Conditions.
8. Communications Plan.
9. Medical Plan.
10. Site Diagram.
11. Traffic Plan.

The IC begins to put together a specific series of activities for assigned personnel. The action plan begins as a mental plan. However, especially in complex or long situations, or if Command will transfer, a written plan is vitally important.

At this particular point, the IAP starts to take shape. It is one of the most effective and efficient methods available for implementing a chosen plan of action. It provides the method through which the IC can direct and control all of the resources available and needed both to initiate and to achieve goals and objectives specified in the plan of action.

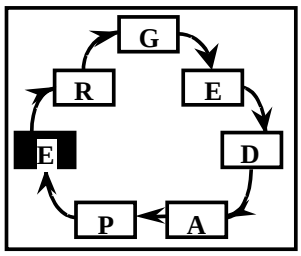
Planning Process

Planning is an ongoing process and never stops until an incident is declared over. The Planning Section is responsible for organizing and performing the planning. The Planning Section may subdivide into units if the situation demands. These units may include a Situation Unit to keep abreast of the situation, a Resources Unit to track all resources, and field observers to keep the Planning Section informed.

The length of time that units or individuals are allowed to operate depends on a specific timed period or major work divisions. Entry teams only make two entries per day into the Hot Zone. In most instances, the time in the Hot Zone depends on air supply. Major work divisions include reconnaissance teams, leak stoppage, spill containment, fire control and spill neutralization. The Planning Section is responsible for planning for these events and ensuring that the IC has the necessary personnel available to accomplish the goals.

As soon as possible into the incident, the Plans Section conducts a Planning Meeting to determine the necessary elements of the IAP and produces the plans based on the strategic goals. The IC and the Safety Officer review the plan for their approval. After approval, all division and group supervisors receive a briefing on the plan.

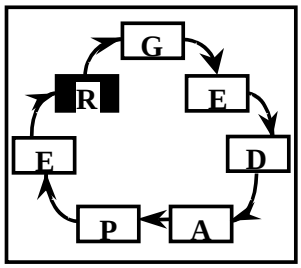
Step 6: Evaluate the Incident Action Plan



Before approving the IAP, the IC must evaluate it to determine its effectiveness. First, the IC verifies that the strategic goals are appropriate. The goals are safety of responders, incident stabilization and protection of property, evidence and the environment.

The IC then determines if the tactical objectives are appropriate for meeting the goals, confirms that sufficient personnel are available, and that equipment and other resources are adequate for the incident. The IC then decides whether the methods selected to accomplish the objectives are efficient and safe, and estimates the results of applying those methods.

Step 7: Review



In the event that the incident does not progress toward the desired outcome, the strategic goals are not met, or the status of the incident changes, as commonly occurs in long operations, the IC must review the original plan. The review process involves an examination of every step of the process, starting with gathering the information. Was some vital piece of information missing, or has the length of the operation radically changed the situation? Was the estimate of incident course based upon some inaccurate, outdated or unknown information? Was the incident potential underestimated or overestimated? Were the incident objectives inappropriate or were the wrong strategies chosen to meet those objectives? Were resource needs greater than anticipated?

If the answer to some of these questions is “yes,” the IC may face a very difficult task. Such situations often compromise the safety of operating personnel as well as the final outcome of the incident. Good managers will not shy away from consulting Operations, Command or staff

personnel to identify the specific problem. The problem may be the result of insufficient feedback from operating personnel, who would have indicated changes in conditions. A brief consultation could remedy that problem. Once the review process is completed, the IC could initiate a modified version of the IAP. Again, the process of evaluation and reevaluation must continue until the modified plan meets its intended objectives.

GEDAPER or any similar process model will provide an IC with the "scientific" tools needed to make critical incident judgments concisely and systematically within the overall incident management process.

IAPs determine the methodology used to accomplish an end. With hazmat incident command, that means incorporating a site safety plan (SSP) and following the established SOP. This plan must be specific, effective, efficient and flexible.

SUMMARY

Two decision-making models were introduced in this unit: recognition-primed decision-making and classical decision-making. For the purposes of this course, the classical decision-making model that we will use is the GEDAPER process. The GEDAPER process, or another decision-making tool, is essential for a safe, efficient response to hazmat incidents. ICs need a comprehensive guide to ensure that no one overlooks any aspect of the response. Plans must exist before the incident, and other plans must be developed as the incident progresses. Workloads and data inflow can overwhelm ICs at hazmat responses unless they delegate tasks. Various plans help the IC to do just that. The plans themselves delegate roles to other responders. An IC who plans the response, works the plan, constantly reviews it, and revises it as needed, will command a much safer and more efficient response.

ACTIVITIES

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Activity 3.1

Risk-Based Response

Purpose

To reinforce the process of recognition-primed decision-making.

Directions

1. The class will be divided into five groups.

2. Each group will be assigned a scenario.

3. Your group will discuss its scenario and identify concerns regarding a safe response to the hazards associated with your scenario (risk-based response).

4. Using the Risk Assessment Tool, identify risks associated with your assigned scenario for each of the vulnerabilities listed. In addition, you may identify risks not easily associated with the Risk Assessment Tool.

5. For each risk identified, your group should identify one or more risk management procedures that could be used to manage risk. For example, if the risk of "Thermal Heat" is identified, "use of structural personal protective equipment (PPE) or a proximity suit" would be an appropriate response.

6. Select a representative to read your scenario and share your risk and risk management procedures with the class.

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Activity 3.1 (cont'd)

Scenarios

Scenario 1

Your team is called to a large office building that houses the local newspaper. There is no printing in this building, only the sales office, distribution, distribution offices and reporters' offices. A reporter opened the postal mail this morning and a short time later discovered a white powder on the desk. Concerned that this could be terrorism, the reporter notified the staff manager, who in turned called 911.

Scenario 2

Your team is dispatched to a vehicle accident at an intersection in town. Upon arrival, you see an overturned truck on an overpass, with the word "Propane" on the tank. It is a single-axle truck that has approximately a 1,000-gallon tank mounted. The vehicle is on its side, and there is a vapor cloud that disappears about 10 feet away from the truck. It is 80 F (27 C) and 45 percent humidity. Traffic is still working around the accident.

Scenario 3

Your team is called to an industrial warehouse that receives, stores, sells and ships industrial chemicals. A person working in the warehouse called 911 after finding a 55-gallon drum that is labeled with a corrosive label. The words "5 percent hydrochloric acid" are stenciled on the side. There is a pinhole leak in the bottom chine of the barrel.

Scenario 4

Your team is called to a farm chemical supply store after a worker on a forklift runs into a pallet of bags that are labeled "Ammonium Nitrate." One bag has torn open and spilled all over the floor. There is a pile of dry powder on the floor where the bag has spilled. Workers are still in the area carrying out their duties.

Scenario 5

Your team is called to a convenience store that sells gasoline from six pumps, diesel from two pumps, and kerosene from a pump at the side of the store. They also have a 20- and 30-pound propane bottle exchange rack outside the front door of the store. A dark pick-up truck speeds across the store parking lot, strikes the propane rack, then spins around and punctures a 30-gallon gasoline tank that was just filled. On your arrival, you smell propane and see gasoline running down the gutter and into a storm drain.

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Activity 3.1 (cont'd)

Risk Assessment Tool Vulnerabilities

	Risk	Risk Management Procedures
Thermal		
Radiological		
Asphyxiation		
Chemical		
Etiological		
Mechanical		
Electrical		
Other		

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Activity 3.2

Risk-Based Decision-Making

Purpose

To reinforce the process of classical decision-making.

Directions

1. The class will be divided into five groups.

2. Each group will be assigned a scenario.

3. In your group, you will discuss the scenario, identify concerns regarding a safe response to the hazard, and provide a summary of how you would handle the incident. Your group must rely on your knowledge, experience and references. Complete the following Tactical Worksheet.

4. Your group will report on your scenario to the class and list your actions to deal with the incident.

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Activity 3.2 (cont'd)

Scenarios

Scenario 1

Your team is called to a vacant building in a residential area that the Drug Enforcement Agency (DEA) and others have had under surveillance. They request your assistance in classifying the materials that were found. At this time, they have found a few cylinders with paperwork nearby that says they contain "uraniumhexaflouride." A nearby school is due to be released in one hour.

Scenario 2

Your team is dispatched to a vehicle accident at an intersection in town. Upon arrival, you see an overturned truck on an off-ramp. The side of the truck has markings from Jack's Plastics, an industrial manufacturer at the industrial park nearby. It is a two-axle truck that is loaded with two totes of acrylonitrile. There is a report that a liquid from the totes is flowing down the ramp and into traffic. It is 80 F and 45 percent humidity. Traffic has not been controlled.

Scenario 3

Your team has been called to an explosion at the county courthouse in a busy downtown area. It occurred at 4:30 a.m. when the building was unoccupied. It did not appear that the explosive device was intended to bring the building down. The first engine company is reporting a significant reading on their Ludlum Radiological Detector. A note was found nearby that said, "I may not get you today, but I will get you some day."

Scenario 4

Your team is called to an old plastics manufacturing facility after a worker, cleaning for the new owners, notices several containers strewn around the loading dock storage area. Some of the containers also are outside, possibly the result of vandalism. Most of the containers look very rusty, and some seem to be leaking. Two containers on the covered dock appear empty, and two other containers have small leaks of faint yellow oily liquid. The containers have a skull and crossbones label and are stenciled "Chloropicrin."

Scenario 5

Your team is called to an industrial warehouse that receives, stores, sells and ships industrial chemicals. A person working in the warehouse called 911 after finding a 55-gallon drum that is labeled with a corrosive label. It is reported that the drums in the area contain acrolein. There is a hole in the bottom chine on the barrel where the forklift tine struck it.

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Activity 3.2 (cont'd)

Tactical Worksheet

List any tactical options that may be appropriate for the objective selected for your assigned scenario. If you do not use an objective listed below, simply state that it's not applicable and move on to the next objective.

Objective Selected	Tactical Options
Isolation	
Notification	
Identification	
Protection	
Control	
Spill Control	
Leak Control	
Fire Control	
Crime Scene	
Termination	
It is critical that you review and evaluate the success or failure of tactical options in accomplishing the objectives, as well as the safety of personnel and the public.	

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NOTE-TAKING GUIDE

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NOTE-TAKING GUIDE

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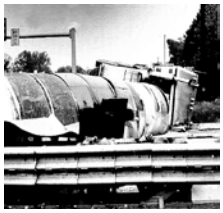
HAZARDOUS MATERIALS INCIDENT MANAGEMENT

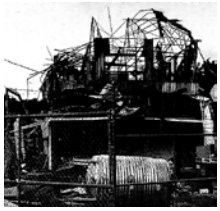


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UNIT 3: DECISION-MAKING





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Slide 3-3



TERMINAL OBJECTIVE

The students will be able to define the use of classical and recognition-primed decision-making in the determination of appropriate incident objectives, strategies and tactics.

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ENABLING OBJECTIVES

The students will:

- **Identify at least one linear decision-making model.**
- **Identify at least one nonlinear decision-making model.**

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ENABLING OBJECTIVES (cont'd)

- **Identify the six model incident objectives for a hazardous materials/weapons of mass destruction (hazmat/WMD) incident.**
- **For a simulated hazmat/WMD incident, implement appropriate incident objectives.**

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DECISION-MAKING



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DECISION-MAKING (cont'd)

Two types of decision-making

Classical Model **Recognition-Primed**





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CLASSICAL DECISION-MAKING

Analytical process
- **Problem, facts, options, best option, implementation and review/follow-up.**

DECIDE, GEDAPER models
Strengths
- **All options are identified, repeatable, support the less experienced; best when time is not a major factor.**

Weaknesses
- **Time, data dependent, paralysis by analysis, does not allow for experience of decision-maker.**

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RECOGNITION-PRIMED DECISION-MAKING

Process
- **Rapid decision-making based on previous experience**
- **Considered an "intuitive" process**

Strengths
- **Uses previous experience, rapid and effective decisions under pressure, mental "war gaming"**

Weaknesses
- **Need an experience base or aggressive simulation training, may not be repeatable, does not evaluate all possible options**

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NFPA 472 (2008 EDITION) RECOMMENDATIONS FOR HAZMAT/WMD RESPONSES

- **Procedural response**
- **Risk-based response**

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VIDEO:

"Gordon Graham — Recognition-Primed Decisionmaking"



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RISK-BASED RESPONSE

A systematic process by which responders analyze a problem involving hazmat/WMD; assess the hazards; evaluate the risks; and determine appropriate response actions based on facts, science and the circumstances of the incident.

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RISK ASSESSMENT

- **Threat/Hazard**
- **Vulnerability**
- **Consequences**
- **Likelihood**

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RISK ASSESSMENT (cont'd)

Hazard

- **Chemical**
- **Biological**
- **Radiological**
- **Nuclear**
- **Explosive**
- **Product**
- **Container**
- **Environment**
- **Cause**

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RISK ASSESSMENT (cont'd)

Vulnerability

- **Thermal**
- **Radiological**
- **Asphyxiation**
- **Chemical**
- **Etiological**
- **Mechanical**
- **Electrical**

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RISK ASSESSMENT (cont'd)

Vulnerability

- **Thermal** → **Time**
- **Radiological** → **Time**
- **Asphyxiation** → **Distance**
- **Chemical** → **Shielding**
- **Etiological** → **Detection**
- **Mechanical** → **Detection**
- **Electrical** → **Detection**

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RISK ASSESSMENT (cont'd)

Consequences

- **Severe**
- **Moderate**
- **Low**

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RISK ASSESSMENT (cont'd)

Likelihood

- **Probability of occurrence is high or low.**
- **Somewhat subjective judgment based on experience of the decision-maker.**

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INITIAL VERSUS DETAILED RISK ASSESSMENT

Initial risk assessment

- **Enables rapid decision-making**
- **Based heavily on recognition-primed decision-making and assessment of essential basic information elements**

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INITIAL VERSUS DETAILED RISK ASSESSMENT (cont'd)

Detailed risk assessment

- **Conducted as more information becomes available.**
- **Greater depth of assessment.**
- **Initial risk management plan is revised as indicated.**

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INFORMATION BASICS

Physical data

- **Through the senses**
- **Instrumentation**



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INFORMATION BASICS (cont'd)

Technical data
- **External references**
- **Computer databases**
- **Technical experts**



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INFORMATION BASICS (cont'd)



Cognitive data
- **Training**
- **Experience**
- **From within one's mind**
- **Analysis, interpretation, extrapolation**

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INFORMATION BASICS (cont'd)



Cognitive data interpretation and skills separate the technician from the specialist.

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HAZMAT/WMD INCIDENT COMPONENTS



Product: any substance involved in the incident

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HAZMAT/WMD INCIDENT COMPONENTS (cont'd)



Container: any object that acts to hold product in an intended location

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HAZMAT/WMD INCIDENT COMPONENTS (cont'd)



Environment

- **Anything that surrounds the product and container**
- **Considered in the broadest context**
- **Exposures, containments, conduits, topography, meteorology and geology**
- **Cause**

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ESSENTIAL ASSESSMENT AREAS

Product
- **Physical state, flammability, toxicity, reactivity, radioactivity**

Container
- **Capacity, operating pressure, damage sustained, probability of failure**

Environment
- **Exposures, meteorological, topography, conduits for spread**

Cause
- **Unintentional, negligence, illicit activities, or intentional**

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Activity 3.1
Risk-Based Response

1. **Identify risks associated with scenario.**
2. **Identify risk management methods that could be implemented.**
3. **How would you measure risk management?**

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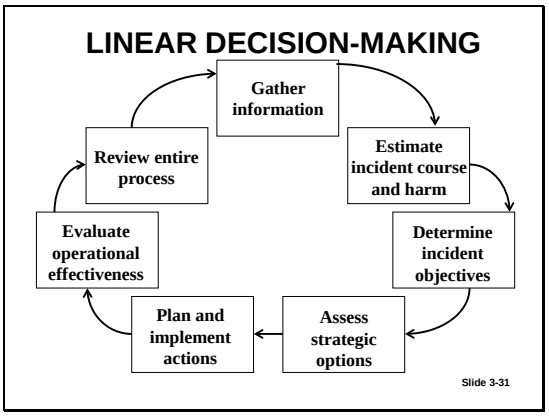
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RISK ASSESSMENT

Vulnerability
- **Thermal**
- **Radiological**
- **Asphyxiation**
- **Chemical**
- **Etiological**
- **Mechanical**
- **Electrical**

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LINEAR

- **Gather information (data) about the product, container, environment and cause**
- **Types of data**
  - **Physical**
  - **Technical**
  - **Cognitive**

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LINEAR (cont'd)

Determine appropriate incident objectives/strategic goals.

- **Isolation (gain control of the scene)**
- **Notification**
- **Identification**
- **Protection**
- **Control — leak, spill, fire, crime scene**
- **Termination**

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GEDAPER

Estimate the potential course and harm

- **Key to risk-based response.**
- **What is the magnitude of the problem now?**
- **What type of problem?**
  - **– Spill — product out of the container.**
  - **– Leak — breach through which product escapes.**
  - **– Fire — rapid oxidation.**
- **Where and how can it spread?**
  - **– Solid, liquid or gas/vapor.**
  - **– Vapor pressure and density.**
- **Meteorology.**
- **Topography.**

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TERMINOLOGY

- **The terms incident objectives and strategic goals often are used interchangeably for short or single operational periods.**
- **For long duration incidents (multiple operational periods) the incident objectives may be broader in scope than the current strategic goals.**
- **For most hazmat incidents, incident objectives and strategic goals may be the same.**

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TERMINOLOGY (cont'd)

- **Incident objectives — desired outcomes to stabilize the incident.**
- **Strategic goal — desired outcomes to stabilize the incident or for the current operational period.**
- **Tactical objective/Tactical options — the principles of how it will be done.**
- **Tasks — the steps that must be done to complete the tactical objective.**

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THE PROCESS

- **Size Up — identifying facts or challenges of an incident (i.e., what is the problem and what safety issues are present?).**
- **Strategic goal — rescue occupants of office building.**
- **Tactical objective — conduct primary search of all floors of office building.**
- **Tasks — working in teams of two, conduct a rapid search of all rooms or areas on all floors, and mark all areas as "search complete."**

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INCIDENT OBJECTIVES, STRATEGIC GOALS AND TACTICAL OBJECTIVES

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

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INCIDENT OBJECTIVES, STRATEGIC GOALS AND TACTICAL OBJECTIVES (cont'd)

Need to know:
- **Product**
- **Container**
- **Environment**
- **Cause of incident**

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LONG-TERM INCIDENTS

- **May have different overall incident objectives than current operational period strategic goals.**
- **Strategic goals may change during the next operational period.**
- **Most hazmat incidents will have the same incident objectives and strategic goals.**

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HAZMAT STRATEGIC GOALS

- **Isolation**
- **Notification**
- **Identification**
- **Protection**
- **Spill control**
- **Leak control**
- **Fire control**
- **Termination**
- **Scene preservation (if criminal intent suspected)**

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INCIDENT OBJECTIVES

- **Broad in scope**
- **What is expected to stabilize incident and return area to normal**

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STRATEGIC GOALS

- **Specific order of accomplishment.**
- **May provide for establishment of appropriate isolation of the incident, extinguish the fire, stop the leak, contain the spill, and terminate the incident.**
- **Do not include tactics to accomplish the goal.**

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TACTICAL OBJECTIVES

- **Specific**
- **Measurable**
- **Define**
  - **What is to happen**
  - **Who is to do it**
  - **Any conditions related to the assignment**

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TACTICAL OBJECTIVES (cont'd)

They describe

- **(A) Audience**
- **(B) Behavior expected**
- **(C) Conditions associated**
- **(D) To what degree**

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TASKS OR METHODS

Procedures that responders employ to accomplish tactical objectives

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TERMINATION

- **Both field and administrative functions are needed to restore to normal status.**
- **Includes operational recovery issues:**
  - **Replenishing supplies.**
  - **Debriefing.**
  - **Holding a critique.**
  - **Following up.**

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CRITIQUE

- **Provide responders with health signs and symptoms.**
- **Obtain information about materials encountered in incident.**
- **Incident and After-Action Reports are critical.**

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Activity 3.2
Risk-Based Decision-Making

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HAZMAT/WMD INCIDENT OBJECTIVES/STRATEGIC GOALS

- **Isolation**
- **Notification**
- **Identification**
- **Protection**
- **Control**
  - **Spill control**
  - **Leak control**
  - **Fire control**
  - **Crime scene**
- **Termination**

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SUMMARY

- **Risk-based response versus procedural response**
- **Recognition-primed decision-making**
- **Classical decision-making process**
- **Six hazmat/WMD incident objectives**

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UNIT 4: OPERATIONAL CONSIDERATIONS

TERMINAL OBJECTIVE

The students will be able to identify unique operational considerations associated with hazardous materials/ weapons of mass destruction (hazmat/WMD) incidents.

ENABLING OBJECTIVES

The students will:

1. *Identify at least three site control measures at a hazmat/WMD incident.*
2. *List three types of decontamination methods that can be implemented at a hazmat/WMD incident.*
3. *Choose appropriate site control measures, personal protective equipment (PPE), and decontamination operations when given a simulated hazmat/WMD incident.*

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OVERVIEW

In this unit, each of the six model incident objectives will be reviewed and discussed in detail. The operational considerations of each objective will be discussed.

SITE CONTROL: ISOLATION

Isolation is securing and gaining control of the entire incident scene. Responder and public safety are primary concerns. Possible strategies and tactics include zoning arrangements, denial of entry, monitoring, initial isolation, initial evacuation, and withdrawal.

It is important to discuss how the process of isolation is achieved at a hazardous materials/ weapons of mass destruction (hazmat/WMD) incident.

Zoning

The incident occurs and has an area of containment of the hazmat/WMD. When the responders arrive at the scene, they have the responsibility of containing these materials to the site of origin, if possible. The first step is to identify boundaries or a perimeter that will separate the potentially contaminated or hazardous area from the nonhazardous area. The hazardous area is called the Hot Zone or the Exclusion Area. Many things will define what makes this area hazardous, including armed attack, chemical, biological, radiological, nuclear and explosive (CBRNE) materials, toxic industrial chemicals (TICs) or other things that present a mechanism of harm to the responders and/or the public (thermal, radiation, asphyxiation, chemical, etiological and mechanical (TRACEM).

When a hazmat/WMD event occurs, there also is the potential for victims who may have some form of contamination. It will take the responders a small amount of time to set up operations, but one of the threats is that the victims may leave the area and spread any contamination to a wider area.

With the incident objective of isolation, a strategy that may be used is to identify an area within the Hot Zone as an area of safe refuge for the victims. This is an area that is far enough away from the hazard so as not to present a continuing risk to the victims, but still within the exclusionary area. If decontamination is necessary, it is an area where the victims may assemble to await decontamination. This may require response personnel to use personal protective equipment (PPE) to enter the area and begin the process of triage, limited treatment, and gathering information from the victims.

There are several aids for determining the size and shape of the Hot Zone or Exclusion Area, including recommendations from the Department of Transportation's (DOT's) North American Emergency Response Guidebook (NAERG). These recommendations are usually for the first 30 minutes of the incident and will provide time for the responders to gather information about the product, container, environment and cause so that they may adjust the zones as necessary.

When the Hot Zone is within a building, zoning may take a three-dimensional shape. To isolate the area around the incident, it may be necessary to restrict the area above and below the incident, as well as around the incident. This brings into consideration both horizontal and vertical zoning.

Another strategy that must be considered when addressing the incident objective of isolation is that of denying entry into an area. This includes any actions to prevent movement into, out of, or within operational zones or perimeters without following appropriate procedure or clearances. This will require the assistance and presence of law enforcement and the implementation of stringent identification and screening procedures.

INITIAL PUBLIC PROTECTION

Three options for protecting the public are available during hazmat incidents. Responders must evaluate the Site Safety Plan based on the options open to each individual jurisdiction and must not plan to perform tasks for which personnel are not trained or equipped to perform. First responders may carry out two options, evacuation and in-place sheltering, with little or no chemical protective equipment. The third option, rescue of trapped or injured victims in the Hot Zone, however, requires a formal entry by trained personnel.

The decision whether to evacuate or shelter-in-place occurs only after assessing which of the options results in the probability of evacuees and responders being in more danger. If the incident involves a short-term air release, in-place sheltering is likely to be preferable. If the incident turns out to be a long-term event, evacuation may be the preferred action.

Short-duration releases are the most suitable for in-place protection. Releases lasting one to two hours are the optimum situation. It has been found that especially in high-concentration situation, after about two hours interior concentrations are similar to those found in the exterior. Further, the concentrations linger within the structure. As a result, after the in-place protection period ends, it is necessary to open up and “air out” the structure.

Several factors influence the choice of in-place sheltering. The Incident Commander (IC) may have to make critical protection decisions based on weather conditions and forecasts. Weather conditions that allow increased downwind travel distance occur on a cool, overcast night with gentle winds. Unstable weather conditions with strong sunlight, clear skies, and high levels of turbulence are conditions that promote rapid mixing and dispersal of the contaminants. Therefore they cause less downwind travel. High humidity and warm air can force vapors toward the ground. During an atmospheric inversion, contamination will travel further downwind than any other weather conditions.

Rescue in the Hot (Exclusion) Zone occurs only after trained entry personnel have made all the required preparations. These functions include setting up and staffing decontamination, arranging for medical monitoring, conducting a hazard assessment, implementating the “buddy system,” and ensuring that backup entry personnel are ready.

Whichever option the IC chooses, there is a need for constant evaluation of the plan, procedures and results. Weather conditions may change rapidly, necessitating a revision of actions to protect the public.

Emergency responders are also responsible for the protection of the public and those not involved in the incident. There are several options for the initial responders to take in the first minutes of the hazmat/WMD incident. The options include evacuation, relocation and in-place sheltering.

Evacuation is a time-consuming process that requires a lot of resources. It requires some analysis of the situation and should not be an automatic response. One of the hazards in evacuation is that you may be moving an unaffected population into a hazardous area. Examples include moving a population out of a building only to expose them to a vapor cloud outside. This was the case during a chlorine leak from a water plant in Boynton Beach, Florida. The water plant notified the hazmat teams and the fire department. The fire department found that a school in close proximity to the water plant was at risk. The school decided to evacuate and called in school buses and notified the parents to pick up their children. During the evacuation, a wind shift caused the chlorine gas cloud to drift over the school property. The result was students, parents and teachers exposed and a mass casualty situation for the local hospital. In review of the incident, the students would have been safer to shelter-in-place.

Some general guidelines to assist with the decision-making in situations like these:

Conduct the evacuation if:

- There is an expectation of a long-duration release.
- There is a massive fire or explosion potential.
- The area or structure is not suitable for sheltering-in-place.

In-place protection should be considered if:

- The area is already highly contaminated.
- There is no mass fire or explosion potential.
- The occupants or the area would be extremely difficult to evacuate.
- An evacuation would expose or present a greater risk to the public.

Protection

Many strategies and tactics can be employed to protect a specific population. During the initial response, the responders use the methods of protection for their safety. They include:

- Time.
- Distance.
- Shielding.
- Monitoring.

This model works for almost every hazard that responders will encounter at a hazmat/WMD event. Response personnel are usually trained and equipped to respond to common hazards that they encounter in their workplace. They are trained to function in PPE. The Occupational Safety and Health Administration (OSHA) recommends that workplace hazards be approached using the following considerations:

- Avoiding the hazard using administrative procedures.
- Using engineering controls to avoid human contact with the hazard.
- As a last resort, if the hazard cannot be avoided and human contact with the hazard is required, the use of PPE.

PERSONAL PROTECTIVE EQUIPMENT

It is interesting to note that the use of PPE is considered the last resort. This is due to the fact that there is no one PPE device or suit that addresses all hazards and that wearing PPE presents hazards to the wearer. Many responders have been injured due to thermal stress, trips and falls, and wearing an inappropriate type of suit for the hazard.

The PPE must be designed to protect against the specific hazard or hazards that may be encountered in the hazard area. Sometimes at incidents with multiple hazards, this requires a compromise and the responders are required to identify the primary hazard that may be the most severe, and also address one or more secondary hazards. Again, no one type of PPE will protect against all hazards that may be encountered at a hazmat/WMD incident. In risk-based response, the responders are required to identify the hazards and select the PPE most appropriate for the identified hazards. The following discusses the types of PPE and the hazards that they will protect against as well as some of their limitations.

The six primary hazards at a hazmat incident are TRACEM. Personnel may encounter these six hazards on the scene of a hazmat incident and must be aware that their PPE is only somewhat effective against them.

Thermal PPE

Structural firefighting protective clothing, commonly referred to as **turnouts**, is for use during fire suppression. It may consist of several materials, as long as it meets safety performance standards. The components include the familiar helmet, coat, boots and gloves. Some communities require that their personnel wear flame-retardant hoods as well. Standard protection also includes positive-pressure self-contained breathing apparatus (PP-SCBA).

Turnouts provide maximum respiratory protection for thermal and chemical hazards, limited body protection for thermal hazards, and minimal body protection for chemical hazards. They are, however, **designed** for structural firefighting, not to protect personnel against chemical hazards — or even extreme fire conditions. Upon contact with flame, all turnouts start to degrade and lose their protective capabilities.

Thermal protection equipment falls into three categories: entry suits, proximity suits, and thermal flash protection suits.

Entry suits will resist **brief exposures to a total flame environment** at temperatures not to exceed 2,000 F (1,093 C). Thermal protection entry suits may provide some, though limited, protection from steam. The components of such an entry suit include a PP-SCBA with a full facepiece, bearing National Institute of Occupational Safety and Health (NIOSH) approval. The coat, pants, hood, gloves and boots must have an outer shell of aluminized fire-retardant material attached to many layers of similarly retardant insulating fabrics. The face shield has a thin film of gold or some other reflective material on its inner surface to reflect radiant heat.

Proximity suits, on the other hand, will resist **brief exposure to heat, not flame**. Although the suits are similar to thermal entry suits, they do not have as many insulating layers and will not endure flame exposure. Like the entry suits, they are not for use in environments where the temperature may exceed 2,000 F. The components of such a proximity suit include a PP-SCBA with a full facepiece, bearing NIOSH approval. The coat, pants, hood, gloves and boots must have an outer shell of aluminized fire-retardant material attached to many layers of similarly retardant insulating fabrics. The face shield has a thin film of gold or other reflective material on its inner surface to reflect radiant heat.

Proximity suits are not suitable to enter flames. They lack sufficient insulation to meet the standards of a thermal entry suit. They only allow the wearer to get **close** to the flames.

Flash protection suits lack the thermal protection provided by either the thermal entry or the proximity suit. They offer only limited protection against instantaneous flashover. They cannot be worn alone but must be used as outerwear protection, over other protective assemblies.

The coat, pants, gloves, hood and boots of this system are aluminized outer garments with minimal insulating qualities. The face shield for this assembly also has a thin layer of gold or some other reflective material on the inner surface of the facepiece.

Radiation PPE

While there is no practical shielding PPE for gamma or neutron radiation, turnout gear with PPE is effective in preventing exposure to alpha and most beta radiation sources. The primary goal is to prevent the radioactive emitters from contaminating the skin or entering the body.

Respiratory Protection

Two options exist for protecting the respiratory system, the technique of filtering the air prior to inhalation or bringing a supply of fresh air to the respiratory tract. Filtering the air can be accomplished through filter masks, air-purifying respirators (APRs), and a motor-driven air pump that supplies air through a filtering system called a powered air-purifying respirator (PAPR). Each of these respiratory devices has its limitations, but all have one common

requirement. Regulations require that anyone who uses a respiratory device must be trained in the use of the device and be properly fitted for the device. Respiratory devices are considered a vital part of chemical, radiological and thermal protective suits.

Chemical Protective Clothing

There are many versions of chemical protective clothing (CPC), and the standards are now requiring that the CPC be performance-based. Traditionally, the Environmental Protection Agency (EPA) "Levels of Protection" were defined as Level A, B, C and D. CPC is now being designed to protect against specific hazards and include the terminology "vapor tight" or "splash resistant" suits. Additionally, some suits are identified as CBRNE suits that protect against specific hazards of WMD. Chemical suits may have flash protection but have very limited protection against flashover, high heat exposure, or fire.

EPA has designated four levels for chemical protective equipment. **None is suitable in an atmosphere containing flammable gases or vapors at concentrations of 10 percent of the lower exposure limit (LEL) or greater.**

Level A chemical protective equipment is appropriate when a responder needs the greatest level of skin, respiratory and eye protection. It is necessary when a product has been identified as hazardous; the strength and concentration of vapors, gases or particulate matter warrants extreme caution; or there is the likelihood of a liquid splash or the danger of personnel becoming immersed in the product. It is also needed in circumstances where the product is still unidentified and operations are to take place in confined or poorly ventilated areas.

Level A equipment consists of both respiratory and body protective components. It includes a PP-SCBA having a full facepiece, and a totally encapsulating chemical protective suit, as well as chemically resistant inner and outer gloves and boots, with the boots made with steel toes and shanks. A disposable protective suit may cover the totally encapsulating one. Optional equipment includes long underwear, coveralls and a hard hat.

Level B chemical protective clothing is worn when the highest level of respiratory protection is necessary, but a lesser concern exists for skin tissue exposure. For example, where the oxygen level within a given area is below 19.5 percent by volume and the atmosphere provides no threat of toxin absorption through or damage to the skin, Level B clothing would be appropriate.

Level B clothing consists of a full facepiece PP-SCBA or a positive-pressure supplied air respirator with escape capability approved by NIOSH. Also required is some form of chemically resistant clothing, like overalls and a long-sleeved jacket, a one- or two-piece chemical splash suit, or disposable chemically resistant overalls. Resistant inner and outer gloves and boots, with steel toes and shanks, also are included. Personnel also may choose to wear chemically resistant boot covers, a hard hat, face shield, and coveralls.

Level C chemical protective clothing is needed when the concentration and type of a substance offers no hazard to the skin, and the quality of the atmosphere is such that APRs would be adequate against airborne contaminants. Level C components include hooded, chemically resistant garments. For example, in addition to the head covering, coveralls, a one- or two-piece chemical splash suit, or disposable chemically resistant overalls are worn.

Also required is a full- or half-mask APR approved by NIOSH, chemically resistant inner and outer gloves, and boots that have steel toes and shanks. Optional apparel includes chemically resistant boot covers, a hard hat, face shield, coveralls, and escape mask (NIOSH-approved). Emergency responders should not use respirators because the particulate size of the product determines the canister type and size. Furthermore, facepiece fitting is essential.

Level D chemical protective clothing is used where a work uniform providing minimum protection would be adequate. It is useful for nuisance levels of contamination only; where there is no known hazard; and the work functions preclude splashes, immersions, or the potential for unexpected inhalation or contact with any hazardous chemicals.

Level D components include chemically resistant boots with steel toes and shanks, and safety glasses or chemical splash goggles. Optional items are gloves, overalls, chemically resistant boot covers, hard hat, escape mask (NIOSH-approved), and face shield.

Firefighting Turnout Gear and Chemical Protection

Firefighting gear with self-contained breathing apparatus (SCBA) has been studied by the U.S. Soldier Biological and Chemical Command (SBC COM) to evaluate its effectiveness against chemical warfare agents. The study was performed under laboratory conditions and the results have been published for the fire service. This study has become known as the "3/30 Rule." ICs and response agencies should evaluate the study and identify procedures for response to this type of incident.

Federal Requirements

A plan for PPE must be a part of an employer's written safety and health program under 29 Code of Federal Regulations (CFR) 1910.120 and 40 CFR 311. An employer's documented program must include the following:

- PPE selection based on hazards that are specific to an incident site, as well as the anticipated equipment use, limitations and anticipated duration of activity.
- The establishment, implementation and enforcement of standards for maintenance, storage, decontamination and disposal of PPE.
- Provisions for the proper fitting of all personnel with appropriate protective equipment and for adequate training in donning, doffing and the operational use of the various suits, as well as the inspection procedures prior to, during and after each such use.

- The implementation of an ongoing evaluation effort to establish the effectiveness of the entire PPE program.

- The establishment, implementation and enforcement of a system that addresses the medical concerns of all employees.

DECONTAMINATION

OSHA defines decontamination as **the removal of hazardous substances from employees and their equipment to the extent necessary to preclude foreseeable health effects.** The National Fire Protection Association (NFPA) has defined decontamination as **a chemical and/or physical process of reducing or preventing the spread of contamination from persons or equipment.**

A combination of elements from these two definitions yields this description of what decontamination is all about: **a chemical and/or physical process used to remove and prevent the spread of a contaminant from an emergency scene, performed because of the contaminant's ability to harm living beings or the environment.** A contaminant is any substance capable of causing harm to life, health or the environment.

It is critical that the IC understands the difference between contamination and exposure. The term exposure describes the condition of a person who has been in **the vicinity** of hazmat and **may** have come in contact with the hazardous materials or their byproducts. These individuals need isolation and examination to determine **if** they are contaminated.

What is Contamination?

A contaminant is any substance capable of causing harm to life, one's health, or to the environment. There are two methods of contamination: direct and cross.

Direct contamination results when someone or something has direct contact with a contaminating substance. This is presumed to happen to anyone or anything entering a Hot Zone at a hazmat incident.

Cross-contamination occurs when someone or something comes into contact with a person or object that has been contaminated. This would happen whenever Hot Zone operating personnel, equipment or contaminated victims are not effectively decontaminated.

Contaminants may have one or more characteristics that make them dangerous and affect the proper method of decontamination. These characteristics include the following:

- The contaminant's potential health impacts.
- The routes of exposure, the anticipated level of tissue destruction, and the target tissues or organs.
- The physical state.

- The form the substance comes in, whether paste, gel, slurry or suspension.
- Its incompatibility or reactivity with any other substances or temperature changes
- Its water solubility.

Contaminated things that can act as "**hosts**" include people, exposed objects, and the environment. The environment includes all living organisms, surface and subsurface soil, the atmosphere, oceans, and waterways. While environmental decontamination (cleanup) is normally not one of the functions of an emergency response agency, oversight of such operations may well prove to be.

Contaminated individuals are those people who have a hazardous material or its byproducts on or in their person. As an example, two people have been in the Hot Zone at a gasoline spill. Both have on full turnouts, including SCBA. Both are isolated since they are **assumed** to be contaminated. The first person has gasoline on his or her turnouts. This person is contaminated. The second person has only been in the area. Since the second person has no gasoline on his or her turnouts and has been wearing SCBA (which would protect from the fumes), the second person would have been **exposed** to the product **but not contaminated**.

This second person should be examined and released and a record of exposure noted. The first person would require decontamination and a medical examination prior to recording contamination, the decontamination procedures used, and his or her medical evaluation. The first person requires medical follow-up. The second person would only require medical follow-up if symptoms became stronger at a later time.

This is a critical piece of information for the IC. Many exposed people may require minimum care and evaluation, but only a few (those with the materials on or in them) might be contaminated. These people require much more time, effort and money to accomplish the decontamination, medical monitoring, and follow-up necessary to meet the safety guidance in the current law and to limit the IC's liability.

Decontamination Procedures

OSHA's 29 CFR 1910.120 requires ICs to have a knowledge and understanding of decontamination. Further, a decontamination plan is part of the emergency response plan and Site Safety Plan that delegate trained, equipped personnel.

Guidance documents for EPA-approved decontamination planning, layouts and procedures exist in the "Occupational Safety and Health Guidance Manual," pp. 85-115.

All decontamination procedures follow a logical order. Personnel being decontaminated move from contaminated to uncontaminated areas inside the Contamination Reduction Zone. Contaminated or "dirty" protective clothing is progressively cleaned and removed.

Emergency Decontamination

First-arriving units may run into contaminated and/or injured victims. Plans must exist to allow for the safe handling of these people, including field decontamination. Individual jurisdictions should each write a standard operating procedure (SOP) to address this possibility.

Protection of Decontamination Personnel

Personnel engaged in decontamination of improperly protected responders, injured victims, or any other person who possibly is contaminated need protection from the contaminants. This normally occurs by using chemical protective clothing and SCBAs. Decontamination teams usually wear protection one level below that of the entry teams.

Extent of Decontamination Required

First responders normally perform emergency decontamination because they are the initial responders on the scene. Contaminated victims and other first-response personnel need decontamination immediately. For this reason, emergency decontamination procedures are simple, easy to follow, and fairly effective. By following accepted guidelines, the first responder can safely perform emergency decontamination.

Full decontamination, however, usually is left to the hazmat response teams. Consisting of many steps, and with considerable personnel and equipment needs, full decontamination is a complex operation requiring planning and coordination.

The decontamination workers wear the same protection level or one level lower than the entry team. Decontamination water is contaminated and responders must treat it as hazardous.

Medical Emergency Decontamination

Often, both the first responders and the decontamination team will have to perform decontamination on victims who also have some sort of medical emergency. By following the proper procedures, the victim receives proper care, and the responders get protection from the contamination.

These procedures include

- Wearing full protective clothing, SCBA and gloves.
- Evaluating airway, breathing, circulation (ABC) and stabilizing the spine.
- Flushing the victim with water and removing and bagging all clothing.
- Flushing skin for one to two minutes.
- Irrigating eye injuries for 15 minutes, if needed.

Location of Emergency Decontamination

The decontamination area is at the interface of the Hot (Exclusion) and Cold (Support) Zones. This area is called the Warm (Contamination Reduction) Zone. All emergency decontamination takes place inside the Warm Zone.

Decontamination Phases

The two major phases of decontamination in the field are gross and secondary. Tertiary decontamination usually occurs at a medical facility and may involve such processes as sterilization or debridement.

Gross Decontamination

Gross decontamination is the removal or chemical alteration of most of the contaminate. Some residual contamination will always remain on the host, and this residual contamination can produce cross-contamination.

Secondary Decontamination

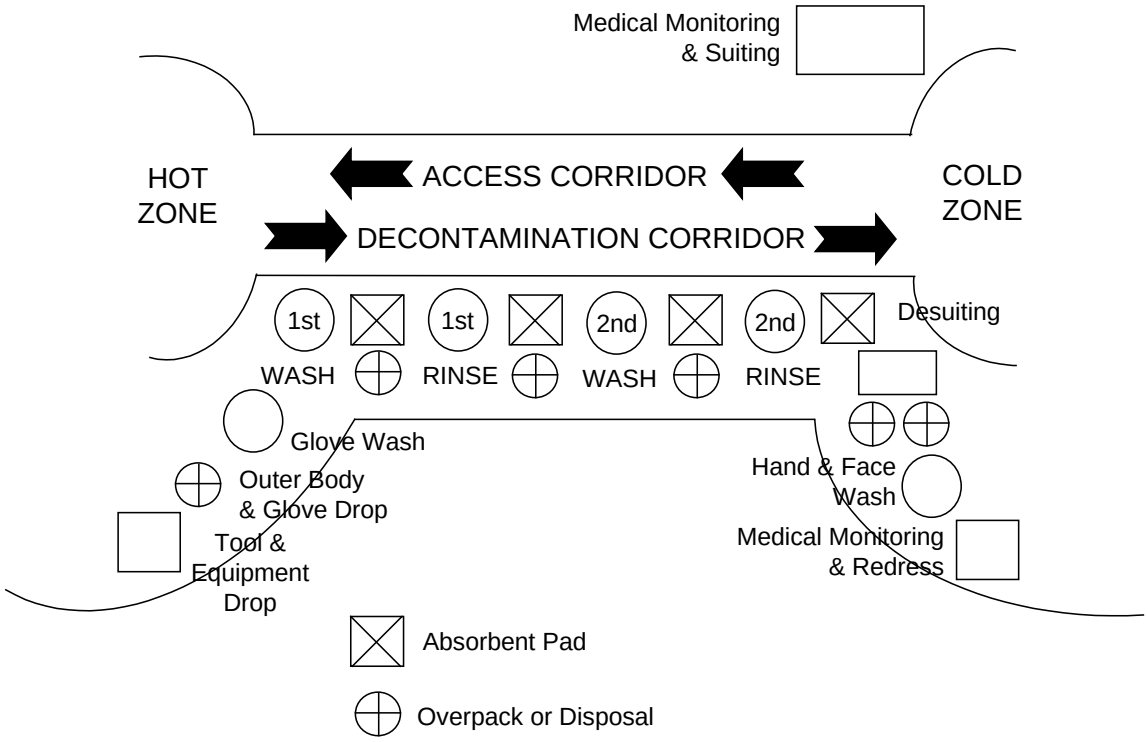
Secondary decontamination is the removal or alteration of most of the residual product of contamination. It provides a more thorough decontamination than the gross effort. After secondary decontamination, some contamination may still remain attached to the host, resulting in permeation and impregnation.

Setting Up for Decontamination

The specific type and level of protection required for the decontamination personnel and doffing attendants vary, depending upon the exact situation and contaminant involved. **A general rule of thumb is that decontamination personnel will wear protection of the same level or one level below that of the entry teams being decontaminated.**

Access and decontamination corridors are set up adjacent to one another in the Warm Zone. They are normally a minimum of 25 feet wide. They need only be between 30 and 50 feet in length, depending on the number of operational steps required and options available. They extend from the inner ring of the Cold (Support) Zone to the outer perimeter of the Hot (Exclusion) Zone.

ACCESS AND DECONTAMINATION SETUP



The precise decontamination approach chosen and the physical setup will vary depending on whether the decontamination is on protected or unprotected people, or equipment, or all three. The approach also depends on the properties of contaminates and other circumstances surrounding the incident. There is much to consider.

The Protected Person — A Responder

For the protected responder, the basic, maximum setup would include a tool and equipment drop, the removal and disposal of gloves and boot covers, and a hand and glove wash. A full first wash and rinse is followed by a second full wash and rinse. The responder then would remove apparel, using a sterile technique. The suit would be processed in whatever way the situation called for, according to the written departmental SOP. The responder would receive coverings for the feet and other exposed body parts and would be permitted to take a "secondary" personal wash. This might include a full body shower followed by redress.

Personnel then receive a medical checkup including pulse, blood pressure, and temperature checks. Weight and electrocardiogram (EKG) readings are optional. Treated according to their needs and given warm or cool fluid replenishment as environmental conditions dictate, they are then allowed to rest.

The Unprotected Person — A Victim

Decontamination of people, including improperly protected and contaminated emergency responders, can require gross, secondary or tertiary decontamination, as discussed earlier.

Additionally, while not normally considered decontamination, the use of hyperbaric chambers to rid the body's system of gaseous hazards such as nitrogen and carbon monoxide are forms of tertiary decontamination.

Decontamination Management Issues

Regulations and common sense require that ICs know the purpose and procedures for decontamination. ICs are responsible and accountable for everything on an incident, including an effective decontamination. Decontamination plans, made in advance and included in the emergency response plan, give a starting point for incident decontamination, but the IC must produce a plan for each specific incident. This specific plan is based on the hazardous material and the nature of the work involved.

Training for decontamination personnel, of course, must occur before the response. The EPA document, "Occupational Safety and Health Guidance Manual," contains approved methods of decontamination. When writing or evaluating the emergency response plan, this is the best time to address training and equipment needs.

SUMMARY

In this unit, the following subjects were covered.

- Site control.
- PPE.
- Decontamination.
- Resources.
- Stress.

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ACTIVITIES

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Activity 4.1

Isolation: Site Control Considerations

Purpose

To practice determining appropriate isolation tactics and needed resources.

Directions

1. There are two different scenarios for this activity. Half of the group will work on Scenario 1, and the other half will work on Scenario 2. You have 40 minutes to research, discuss and answer the questions with each scenario.

2. Groups then will present their findings.

Scenario 1

At approximately 0800 hours on a Monday morning in April, a postdoctoral veterinary lab assistant at the State University School of Veterinary Medicine is assisting students with their three-hour lab class. As he opens the door to the incubator, he hears a noise and a crash. As the door swings open, the lab assistant realizes that a whole wall of shelving within the incubator has collapsed. In an instant, petri dishes, slants, other laboratory glassware, and a whole host of other specimen containers hit the floor. The lab assistant and four other students who are following him are hit and splashed with container fragments, liquid growth media, and agar bits. The lab assistant notifies college security who, in turn, notify the municipal 911 center.

Upon arrival, responders are met by the veterinary infectious disease professor whose students were using the lab. She indicates that the incubator contains samples of all types of pathogenic bacterial and viral agents. She states that they include salmonella enteritidis, E. coli, viral encephalitis, staphylococcus, yersinius pestis, and many other zoonotic organisms and agricultural pathogens. It is further learned that some of the students who were in the lab have dispersed throughout the lab building. Some are in the hall outside the lab, while others have gone to the lounge in the building.

It is a sunny day with light and variable winds; humidity is 68 percent and the temperature is 59 F (15 C).

Questions

1. Identify the primary considerations involving isolation on the incident. _____

2. Identify where the incident's perimeter (outer perimeter), zones and subzones would be established. _____

3. Identify the initial public protection action(s) your group would use. _____

Scenario 2

At approximately 1315 hours on a Thursday in October, an aluminum DOT 306 cargo tank placarded UN 1203 is sideswiped by a box trailer on Fourth Avenue southwest at the intersection of Fourth Street. The impact results in a tear high on the left side in the rear compartment. As the product splashes from the tear, it ignites.

The vehicle comes to a halt on Fourth Avenue just north of the intersection. The driver exits the cab and runs up Fourth Avenue. At this point, liquid product has poured onto the street and flowed into the storm sewers. The tank starts to melt down and expose and ignite other compartments. There is burning product on the street and in the storm sewer.

It is an overcast day with temperatures in the upper 50s. Winds are from the south at 3 to 5 mph. The humidity is 63 percent, and the barometer is falling.

Questions

1. Identify the primary considerations involving isolation on the incident. _____

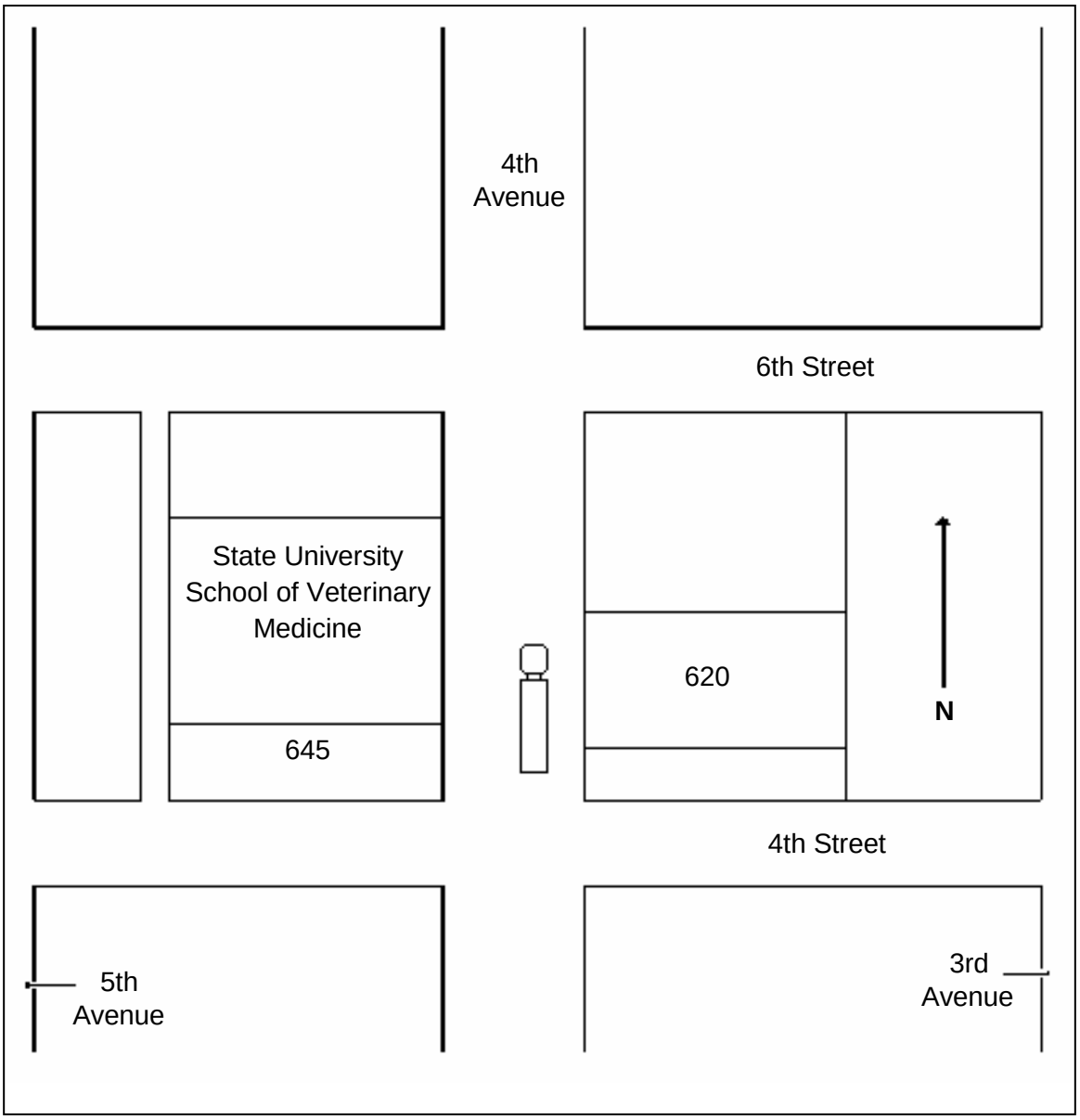
2. Identify where the incident's perimeter (outer perimeter), zones and subzones would be established. _____

3. Identify the initial public protection action(s) your group would use. _____

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Activity 4.1 (cont'd)

Plot Plan



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Activity 4.2

Personal Protective Equipment

Purpose

To practice identifying appropriate PPE, based on a scenario.

Directions

1. You will be divided into four groups and assigned a scenario. Read and identify the appropriate decontamination operations to be used based on your scenario.

2. You will have approximately 30 minutes to work on this activity.

3. Groups will report their answers and the reasoning behind them.

Scenario 1

At 1000 hours, personnel at the Civelo Chemical Company are moving a pallet of 55-gallon drums containing a paint-related material (UN 1263). The material is identified as lacquer thinner. As a forklift moves to put a pallet containing four drums on the second tier of a rack storage system, it hits a bump and the drums fall from about 6 feet. As they strike the floor inside the loading dock, three drums split open. One loses all of its contents and the others a major portion. Personnel notify the fire department of the problem.

Upon arrival, plant personnel provide the first-due engine company with a Material Safety Data Sheet (MSDS) for the product. The MSDS indicates that lacquer thinner has a permissible exposure limit (PEL) of 200 parts per million (ppm), is toxic by all routes of exposure, and has a flashpoint of less than 20 F (-6.7 C). When exposed to the heat of a fire, the container may explode, and some components are considered possible carcinogens. The primary constituents include toluene, xylene, methyl ethyl ketone, and ethyl acetate.

Facility personnel have evacuated the area. There are approximately 200 pallets of lacquer thinner stored on the high racks in the area of the spill.

It is an overcast Wednesday in October. The temperature is about 68 F (20 C), humidity is 58 percent, and winds are calm.

Questions

1. Identify the primary and secondary hazards associated with this situation. _____

2. Identify how these hazards affect the selection of appropriate PPE. _____

3. What PPE would you have the decontamination personnel wear and why? _____

Scenario 2

At 1640 hours, a 6,000-gallon, DOT 312 cargo tank develops a leak as it proceeds north on Interstate 99. As it approaches the Fourth Street exit, the driver notices a release of product from the trailer. He pulls to the side of the road and stops.

The first-arriving unit finds product coming from the bottom of the cargo tank and vapor coming from one of the manways. This unit indicates that the cargo tank is placarded Corrosive with a UN 1760. The captain has the shipping papers, and they indicate the liquid is a hazardous waste.

Upon arrival, you find from the hazardous waste assay with the cargo manifest that the product contains a waste mixture of hydrofluoric acid (0.5 to 20 percent), sulfuric acid (1.0 to 30 percent), phosphoric acid (1.0 to 40 percent), water (20 to 60 percent), arsenic (0.1 to 2 percent), lead (0.1 to 8 percent), and mercury (0.1 to 1.88 percent). Closer observation indicates that the leak appears to be directly through the side wall of the cargo tank; vapor is, in fact, venting from two manways. The driver further states that he can't figure it out because it is a stainless steel tank that they always use for corrosives, and all the gaskets are Teflon® and should not fail.

Questions

1. Identify the primary and secondary hazards associated with this situation. _____

2. Identify how these hazards affect the selection of appropriate PPE. _____

3. What PPE would you have the decontamination personnel wear and why? _____

Scenario 3

On a Monday evening at approximately 2300 hours, personnel at the Begnaud Specialty Metals working in the metal separation area are knocked to the floor by an explosion. A cloud of white fumes comes rolling through the area. They pick themselves up and see that an explosion has occurred in chemical reactor vessel 3. The top of the reactor vessel is blown off, and a cloud of white smoke is emitting from the opening. The workers can see the bright orange glow of a fire inside the reactor. This production area is equipped with explosion venting throughout.

Workers call 911 and indicate that they have had an explosion and fire involving sodium metal. First-arriving units confirm that metallic sodium is burning in the reactor vessel. On arrival, plant personnel inform you that there are about 250 pounds of sodium burning in the reactor. They state that they have salt to extinguish the fire.

The original explosion partially dislodged one of the explosion vents and buckled an overhead bay door. There is a significant amount of white smoke pouring from the building, but visibility within is still relatively good.

Questions

1. Identify the primary and secondary hazards associated with this situation. _____

2. Identify how these hazards affect the selection of appropriate PPE. _____

3. What PPE would you have the decontamination personnel wear and why? _____

Scenario 4

At 1105 hours, an 8,000-gallon, IM 102 intermodal tank being used as a horizontal storage tank at the Hi Pure Chemical Company springs a leak in a pipe that comes from the bottom of the tank. The tank contains concentrated muriatic acid (industrial fuming, hydrochloric acid) and is approximately 10 feet off the ground. It is perched on top of another intermodal tank. This lower tank also contains muriatic acid.

As the release starts, the acid soaks a worker. A substantial release develops. The contaminated victim starts to leave the area and collapses. The worker is about 30 feet from the pool of product. Product is forming a pool on the concrete floor of the facility. When hazmat arrives, the first responders have isolated the area and started flushing the victim. They are wearing turnouts and SCBA.

Questions

1. Identify the primary and secondary hazards associated with this situation. _____

2. Identify how these hazards affect the selection of appropriate PPE. _____

3. What PPE would you have the decontamination personnel wear and why? _____

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Activity 4.3

Delivery Truck Incident

Purpose

To apply the appropriate strategic goals of an incident involving a simulated chemical incident and determine appropriate tactical objectives. The response will primarily involve first responders trained to the operations level.

Directions

1. Review the material provided for this chemical incident.

2. Review resources for your city (Center City) as well as neighboring communities.

3. Complete the following assignments in your small groups:

    a. Determine critical size-up factors. Complete Size-Up Information Worksheet.

    b. Determine which hazmat strategic goals are to be used. Complete Strategic Goals/Incident Objectives Worksheet.

    c. Determine what decontamination measures are appropriate. Complete Decontamination and Critical Safety Factors Worksheet.

    d. Evaluate critical safety issues that are present, and determine what risk management measures you will implement. Complete Risk Management Worksheet.

    e. Complete ICS Form 201, Incident Briefing and ICS 208HM, Site Safety and Control Plan as directed by instructors.

4. Diagram your incident management structure on an easel pad.

5. Select a representative to explain how you managed this incident.

Scenario

It is a beautiful, sunny Friday afternoon, with a temperature of 70 F, in early September. You are dispatched to a report of a tractor-trailer box truck leaking an unknown corrosive and oxidizer while making a delivery at a local pool supply company. When the driver tried to make a scheduled delivery, it was discovered that one of the pallets had broken free and tipped over, causing some boxes to shift and break open. This shifting caused the contents inside the boxes to break open, spill out, mix together, and cause an unidentified hazardous materials release.

Pictures of Incident





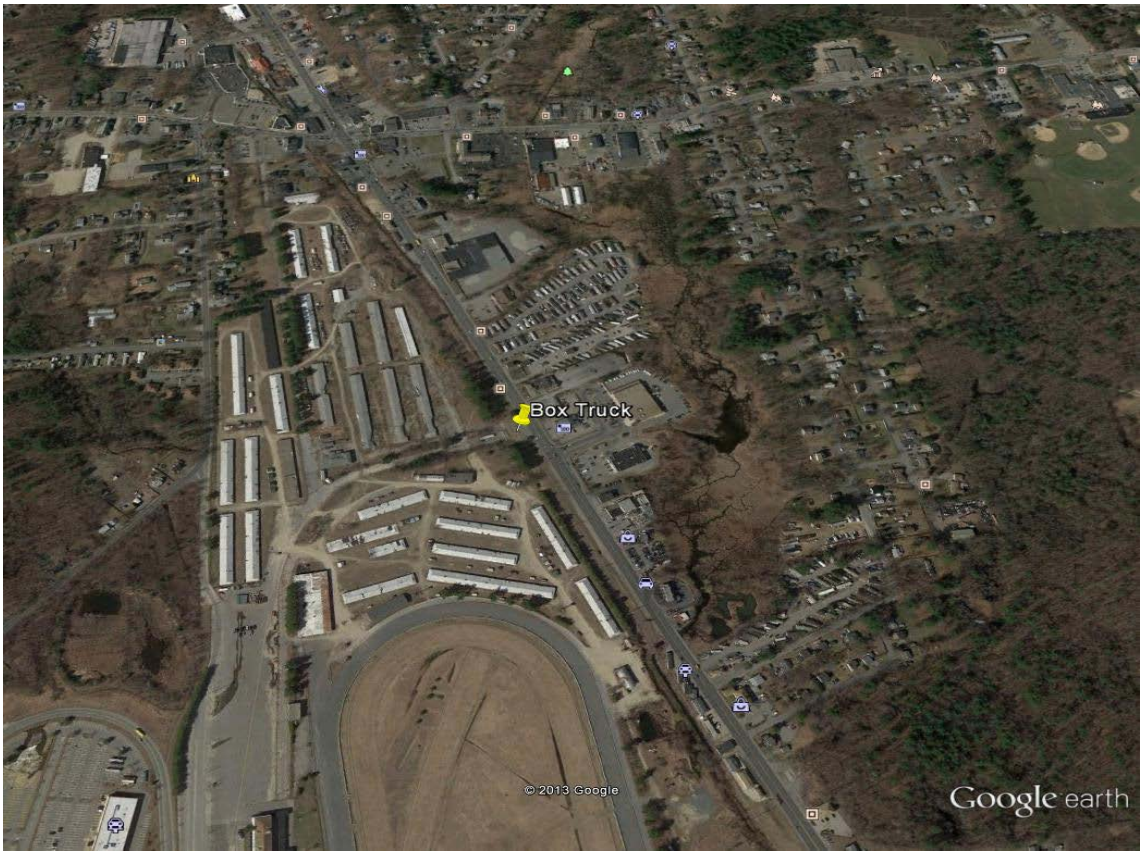

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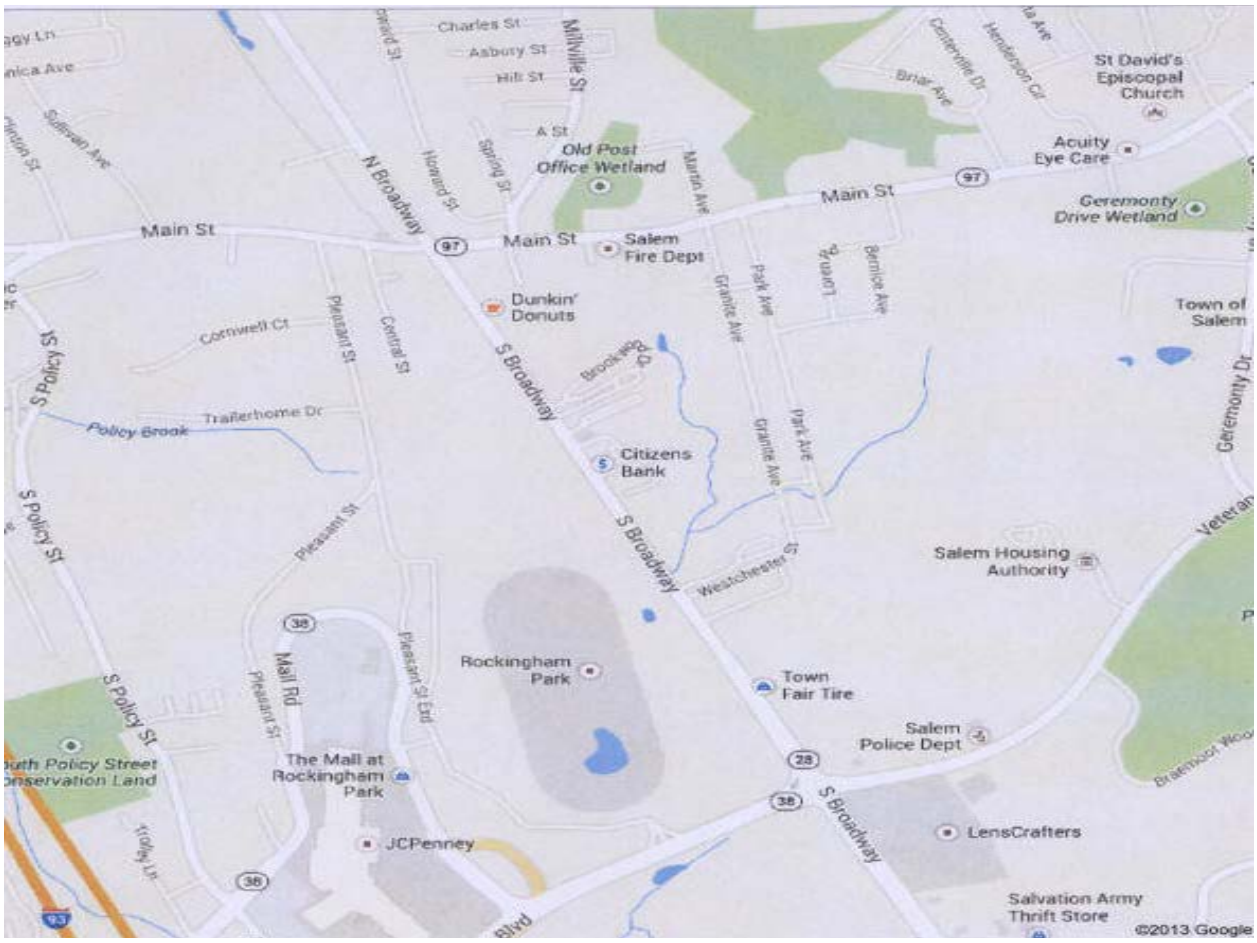



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Briar Ave
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Town of Salem
Ceremonty Dr
Cotswell Ct
Pleasant St
Central St
S Broadway
Brookridge Dr
Citizens Bank
S Policy St
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Policy Brook
Westchester St
Salem Housing Authority
Rockingham Park
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Pleasant St Ext
Town Fair Tire
Salem Police Dept
The Mall at Rockingham Park
JCPenney
LensCrafters
Salvation Army Thrift Store
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Activity 4.3 (cont'd)

Center City Resource Inventory

Resource Provider	Resource	Special Information
Center City	**Police Department**	
	Total uniformed staff 124	Normal shift manning:
	1 Chief	day 30, afternoon 30, midnight 22
	2 Assistant Chiefs	
	10 Shift Sergeants	
	8 Detectives	Trained as crime scene evidence techs
	2 Juvenile Officers	
	10 Special Services Units	SWAT, hostage negotiation, explosives
	10 Office and detention (3 holding cells)	
	59 Patrol Officers	
	2 Training Specialists	
	22 Reservists (Peace Officers)	Traffic, parade duty, special events
	Special equipment	30-passenger bus, robot (Bomb Unit) 14-foot boat on trailer, 50-horsepower (hp) motor
	Note: All police officers are state certified, the department is nationally accredited, all cars have automated external defibrillators (AEDs), and several officers are emergency medical technician (EMT) certified.	
	Fire Department	
	Total uniformed staff 111 full time, 32 call members (firefighter 1 certified)	
	1 Chief	
	4 Assistant Chiefs	
	1 Training Captain	
	4 Fire Prevention/Inspection/Investigation Officers	
	Engine 1: 1,500 gpm, 1,000 gal tank (staffs 4)	
	Engine 2: 1,500 gpm, 1,000 gal tank (staffs 4)	
	Engine 3: 1,500 gpm, 1,000 gal tank (staffs 3)	
	Engine 4: 1,250 gpm, 750 gal tank (staffs 3)	
	Ladder 1: 100-foot ladder w/1,500 gpm and 200 gal tank (staffs 3)	
	Reserve Engine 5: 1,000 gpm, 500 gal tank — not staffed	
	Rescue Engine 1: 1,500 gpm, 1,000 gal tank (staffs 5) (responds to all calls)	
	Special Services Unit 1 — reserve engine equipped as a Level A Hamat Unit staffed by Rescue 1 staff when needed (carries 100 gal aqueous film-forming foam (AFFF))	
	Ambulance 1 — basic life support (BLS) (staffs 2)	
	Reserve Ambulance 2 — not staffed	
	Special equipment	City command bus 14-foot rescue boat w/35-hp motor

Resource Provider	Resource	Special Information
	Note: All full-time firefighters are certified EMTs (various levels), 68 career and 32 call members are certified in hazmat operations, and 42 career are certified at the technician level. All Rescue, Engine and Ladder 1 staff are technicians and receive bonus pay. Engine companies do Emergency Medical Survives (EMS) first response for all life-threatening EMS calls. All members carry pagers for callback duty.	
Center City	**Public Works — total staff 87**	
	Street department, water department, parks department — also operate county sewage treatment plant	Dump trucks, snowplows, sand trucks, loaders, excavation equipment, barricades, and dewatering pumps
	Emergency Management/Planning Department — total staff 3	
		Maintain and support City Emergency Operations Center (EOC)
	American Red Cross — full-time staff 3, call staff of 12	
		Operate food services vehicle Negotiate contracts for emergency shelters
	Silver Cross EMS	
		1 advanced life support (ALS) and 1 BLS transport staffed daily
	Mercy Hospital	
		40-bed short-term care emergency room, operating room (minor surgery only), nearest trauma center 45 minutes
North Town	**Police Department — total staff 32 Sworn Officers**	
15-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 4 Sergeants, 1 Juvenile Officer, 25 Patrol Officers	Rehab bus/Command Post (15 passengers)
	Fire Department — total staff of 22 full time and 20 call members	
	1 Chief, 1 Assistant Chief, 1 Fire Prevention/Investigation/Training Officer Engine 1: 1,750 gpm, 1,250 gal tank (staffs 3) Engine 2: 1,250 gpm, 1,000 gal tank (staffs 2) Ladder 1: 100-foot quint 1,500 gpm, 200 gal tank (staffs 1) Reserve Engine 3: 1,000 gpm, 1,000 gal tank — not staffed	

Resource Provider	Resource	Special Information
	EMS provided by Silver Cross	
	Note: All staff hazmat operations trained and have a decontamination trailer.	
South Town	**Police Department — total staff 60 Sworn Officers, 14 Reservist (Peace Officers)**	
20-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 6 Shift Sergeants, 2 Juvenile Officers, 1 Training Officer, 50 Patrol Officers	
	Fire Department — total staff 38 career, 24 volunteer	
	1 Chief, 2 Assistant Chiefs, 1 Training Captain, 2 Fire Prevention/Public Ed, Fire Investigation	
	Engine 1: 1,500 gpm, 1,000 gal tank (staffs 4) Engine 2: 1,500 gpm, 1,000 gal tank (staffs 4) Ladder 1: 100-foot articulated boom — no pump/water (staffs 2) Ambulance 1: ALS level (staffs 2)	
	Note: All career are level 2 firefighters, hazmat technician certified, and EMS trained. Volunteers are mostly level 2 firefighters, hazmat operations, some EMS trained.	
Ridge County	**Public Works — total staff 62**	
	Typical highway department	
	Emergency Management	
30-minute response time for on-duty resources	Maintain and staff County EOC (staffs 15)	Operate County 911 dispatch center
	Health Department — total professional staff 34 including 14 RNs	
	Sheriff's Department — total staff of 67	
	Jail (staffs 24) Office/Booking/Evidence/etc. (staffs 8) Road patrol (staffs 30)	
State	**Police — typically 6 officers in county patrolling and other duties**	
	Can provide 45 officers with 3-hour notice	
	Highway Department — typically 20 workers in county	
	Can provide 45 workers with 3-hour notice	

Resource Provider	Resource	Special Information
	National Guard	
	Engineering Unit in Center City — normal staffing is 100. Today 60 are deployed.	
Other Resources	**Civil Support Team 007**	
	3-hour response time	
	Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)	
	3-hour response time	
	FBI	
	3-hour response time	
	Baldwin Level A Hamat Team	
	2-hour response time (staffs 8 technicians)	
	Exeter Level B Hazmat/Decontamination	
	2-hour response time (staffs 8 technicians)	
	Private hazmat spill cleanup contractor	
	3- to 4-hour response time	

Activity 4.3 (cont'd)

Size-Up Information Worksheet

Product(s): _____

Container(s): _____

Environment: _____

Other critical factors: _____

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Activity 4.3 (cont'd)

Strategic Goals/Incident Objectives Worksheet

Below are typical strategic goals or items that may become incident objectives. Use this page to write Specific, Measurable, Achievable, Realistic and Timeframed (SMART) incident objectives for each strategic goal you wish to use.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Recovery/Termination:
Other incident objectives/goals:

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Activity 4.3 (cont'd)

Tactical Objectives Worksheet

For each incident objective/strategic goal identified on the Strategic Goals/Incident Objectives Worksheet, list the tactical objective you would use to accomplish that goal. The tactical objectives assigned should be within the scope of duty for the responders who will be assigned to them and within a standard of care.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Termination/Recovery:

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Activity 4.3 (cont'd)

Decontamination and Critical Safety Factors Worksheet

What decontamination measures will you employ before the responders take any action where they may be exposed to the product(s), and what, if any, decontamination measures would you take following the incident?

Critical safety factors for first responders:
Critical safety factors for people within the incident Hot Zone:
Critical safety factors for the public:
Other critical factors:

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Activity 4.3 (cont'd)

Risk Management Worksheet

For each safety issue identified for the incident, as the IC, what risk management measures would you initiate or have initiated?

Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:

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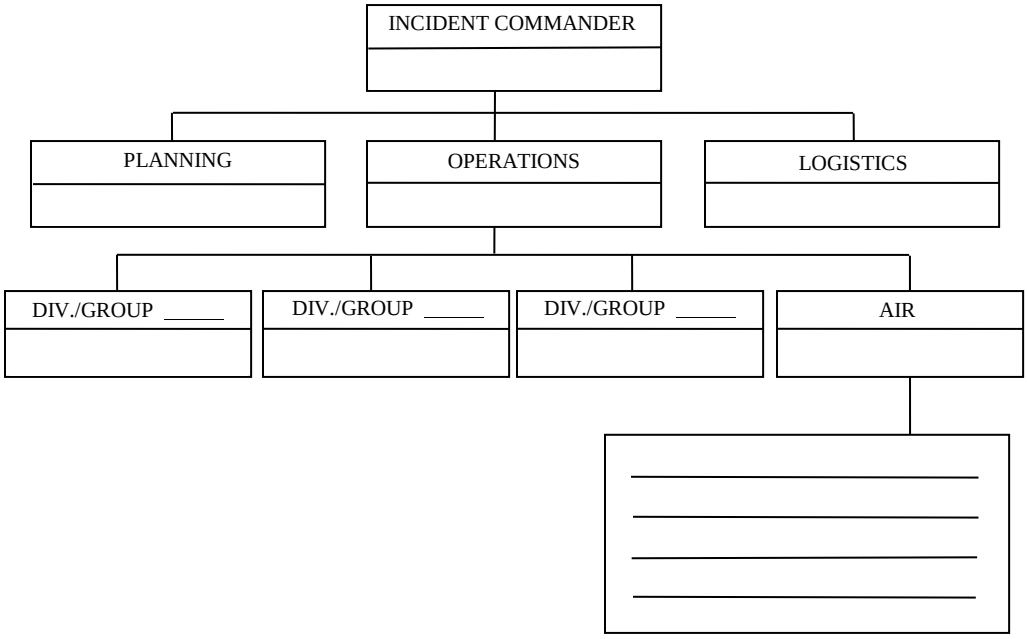
Activity 4.3 (cont'd)

ICS Form 201, Incident Briefing

INCIDENT BRIEFING	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. MAP SKETCH			
ICS 201 (12/93) **NFES 1325**	PAGE 1	5. PREPARED BY (NAME AND POSITION)	

6. SUMMARY OF CURRENT ACTIONS		

7. CURRENT ORGANIZATION



ICS 201 (12/93) **NFES 1325**	PAGE 3	

8. RESOURCES SUMMARY				
RESOURCES ORDERED	**RESOURCES IDENTIFICATION**	**ETA**	**ON SCENE √**	**LOCATION/ASSIGNMENT**
ICS 201 (12/93) NFES 1325	PAGE 4			

Activity 4.3 (cont'd)

ICS Form 202, Incident Objectives

INCIDENT OBJECTIVES	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. OPERATIONAL PERIOD (DATE/TIME)			
5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)			
6. WEATHER FORECAST FOR OPERATIONAL PERIOD			
7. GENERAL SAFETY MESSAGE			
8. ATTACHMENTS (√ IF ATTACHED) ☐ ORGANIZATION LIST (ICS 203) ☐ MEDICAL PLAN (ICS 206) ☐ _____ ☐ ASSIGNMENT LIST (ICS 204) ☐ INCIDENT MAP ☐ _____ ☐ COMMUNICATIONS PLAN (ICS 205) ☐ TRAFFIC PLAN ☐ _____			
202 ICS 3-80	9. PREPARED BY (PLANNING SECTION CHIEF)	10. APPROVED BY (INCIDENT COMMANDER)	

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Activity 4.3 (cont'd)

ICS Form 203, Organization Assignment List

ORGANIZATION ASSIGNMENT LIST			1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
POSITION	NAME		4. OPERATIONAL PERIOD (DATE/TIME)		
5. INCIDENT COMMANDER AND STAFF					
INCIDENT COMMANDER			9. OPERATIONS SECTION		
DEPUTY			CHIEF		
SAFETY OFFICER			DEPUTY		
PUBLIC INFORMATION OFFICER			a. BRANCH I — DIVISION/GROUPS		
LIAISON OFFICER			BRANCH DIRECTOR		
6. AGENCY REPRESENTATIVES			DEPUTY		
AGENCY	NAME		DIVISION/GROUP		
			DIVISION/GROUP		
			DIVISION/GROUP		
			DIVISION/GROUP		
			DIVISION/GROUP		
			b. BRANCH II — DIVISION/GROUPS		
			BRANCH DIRECTOR		
7. PLANNING SECTION			DEPUTY		
CHIEF			DIVISION/GROUP		
DEPUTY			DIVISION/GROUP		
RESOURCES UNIT			DIVISION/GROUP		
SITUATION UNIT			DIVISION/GROUP		
DOCUMENTATION UNIT			DIVISION/GROUP		
DEMOBILIZATION UNIT			c. BRANCH III — DIVISION/GROUPS		
TECHNICAL SPECIALISTS			BRANCH DIRECTOR		
			DEPUTY		
			DIVISION/GROUP		
			DIVISION/GROUP		
			DIVISION/GROUP		
			DIVISION/GROUP		
8. LOGISTICS SECTION			DIVISION/GROUP		
CHIEF			d. AIR OPERATIONS BRANCH		
DEPUTY			AIR OPERATIONS BR. DIR.		
a. SUPPORT BRANCH			AIR TACTICAL GROUP SUP.		
DIRECTOR			AIR SUPPORT GROUP SUP.		
SUPPLY UNIT			HELICOPTER COORDINATOR		
FACILITIES UNIT			AIR TANKER/FIXED-WING CRD.		
GROUND SUPPORT UNIT			10. FINANCE/ADMINISTRATION SECTION		
b. SERVICE BRANCH			CHIEF		
DIRECTOR			DEPUTY		
			TIME UNIT		
COMMUNICATIONS UNIT			PROCUREMENT UNIT		
MEDICAL UNIT			COMPENSATION/CLAIMS UNIT		
FOOD UNIT			COST UNIT		
203 ICS 1-82			11. PREPARED BY (RESOURCES UNIT)		

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Activity 4.3 (cont'd)

ICS Form 206, Medical Plan

MEDICAL PLAN	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED	4. OPERATIONAL PERIOD

5. INCIDENT MEDICAL AID STATIONS

MEDICAL AID STATIONS	LOCATION	PARAMEDICS	
		YES	NO

6. TRANSPORTATION

A. AMBULANCE SERVICES

NAME	ADDRESS	PHONE	PARAMEDICS	
			YES	NO

B. INCIDENT AMBULANCES

NAME	LOCATION	PARAMEDICS	
		YES	NO

7. HOSPITALS

NAME	ADDRESS	TRAVEL TIME		PHONE	HELIPAD		BURN CENTER	
		AIR	GRND		YES	NO	YES	NO

8. MEDICAL EMERGENCY PROCEDURES

206 **ICS** 8-78	9. PREPARED BY (MEDICAL UNIT LEADER)	10. REVIEWED BY (SAFETY OFFICER)

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Activity 4.3 (cont'd)

ICS Form 208HM, Site Safety and Control Plan

SITE SAFETY AND CONTROL PLAN ICS 208 HM	1. Incident Name:	2. Date Prepared:	3. Operational Period Time

Section I. Site Information

4. Incident Location:

Section II. Organization

5. Incident Commander:	6. HM Group Supervisor:	7. Tech, Specialist — HM Reference:
8. Safety Officer:	9. Entry Leader:	10. Site Access Control Leader:
11. Asst. Safety Officer — HM:	12. Decontamination Leader:	13. Safe Refuge Area Mgr.
14. Environmental Health:	15.	16.

17. Entry Team: (Buddy System) Name:	PPE Level	18. Decontamination Element: Name:	PPE Level
Entry 1		Decon 1	
Entry 2		Decon 2	
Entry 3		Decon 3	
Entry 4		Decon 4	

Section III. Hazard/Risk Analysis

19. Material:	Container type	Qty.	Phys. State	pH	IDLH	F.P.	I.T.	V.P.	V.D.	S.G.	LEL	UEL

Comment:

Section IV. Hazard Monitoring

20. LEL Instrument(s):	21. O_2 Instrument(s):
22. Toxicity/PPM Instrument(s):	23. Radiological Instrument(s):

Comment:

Section V. Decontamination Procedures

24. Standard Decontamination Procedures:	YES:	NO:

Comment:

Section VI. Site Communications

25. Command Frequency:	26. Tactical Frequency:	27. Entry Frequency:

Section VII. Medical Assistance

28. Medical Monitoring:	YES:	NO:	29. Medical Treatment and Transport In-Place:	YES:	NO:

Comment:

ICS 208 HM **Page 1** **3/98**

Section VIII. Site Map

30. Site Map:



Weather ☐ Command Post ☐ Zones ☐ Assembly Areas ☐ Escape Routes ☐ Other ☐

Section IX. Entry Objectives

31. Entry Objectives:

Section X. SOPs and Safe Work Practices

32. Modifications to Documented SOPs or Work Practices:	YES:	NO:

Comment:

Section XI. Emergency Procedures

33. Emergency Procedures:

Section XII. Safety Briefing

34. Asst. Safety Officer — HM Signature:	Safety Briefing Completed (Time):
35. HM Group Supervisor Signature:	36. Incident Commander Signature:

Activity 4.3 (cont'd)

Material Safety Data Sheets

Arch Chemicals, Inc.

MATERIAL SAFETY DATA SHEET

FOR ANY EMERGENCY, 24 HOURS / 7 DAYS, CALL:	1-800-654-6911
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL:	1-800-511-MSDS

PRODUCT NAME: **BAQUACIL AD Shock & Oxidizer**
EPA Registration Number: NOT APPLICABLE

1. PRODUCT AND COMPANY IDENTIFICATION

Arch Chemicals, Inc.
501 Merritt 7 PO Box 5204
Norwalk, CT 06856-5204

REVISION DATE:	12/13/2005
SUPERCEDES:	12/13/2005
MSDS Number:	000000001740
SYNONYMS:	Dihydrogen dioxide (solution)
CHEMICAL FAMILY:	Hydrogen peroxide
DESCRIPTION / USE:	Swimming pool oxidizer
FORMULA:	None established

2. HAZARDS IDENTIFICATION

OSHA Hazard Classification:	**Oxidizer, Corrosive to eyes., Corrosive to respiratory tract., Corrosive to gastrointestinal tract, Skin irritant**

Routes of Entry:	Inhalation, skin, eyes, ingestion
Chemical Interactions:	Oxidizer and will react with many substances in the body.
Medical Conditions Aggravated:	Pre-existing eye disease, Respiratory diseases including asthma and bronchitis, Dermatitis may be aggravated following exposure.

Human Threshold Response Data

Odor Threshold	
HYDROGEN PEROXIDE (H2O2)	Not established.
Irritation Threshold	
HYDROGEN PEROXIDE (H2O2)	150 mg/m3

Hazardous Materials Identification System / National Fire Protection Association Classifications

Hazard Ratings :	Health	Flammability	Physical / Instability	PPI / Special hazard.
HMIS	3	0	1	
NFPA	3	0	1	Oxidizer

Immediate (Acute) Health Effects

Inhalation Toxicity:	Inhalation of mist or vapor may cause irritation and/or burns to the mucous membranes of the respiratory tract.
Skin Toxicity:	Not expected to be absorbed through the skin. Moderate Skin Irritant

Eye Toxicity:	Corrosive. Burns can occur following exposure. Direct contact may cause impairment of vision, corneal damage and/or blindness. Rinsing of the eye should take place immediately.
Ingestion Toxicity:	Harmful if swallowed. Irritation and/or burns can occur to the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding, and/or tissue ulceration. Ingestion may cause severe damage to the gastrointestinal tract with the potential to cause perforation. May cause rapid release of oxygen which may expand the esophagus or stomach resulting in severe damage.
Acute Target Organ Toxicity:	Eyes, Skin, Digestive Tract, Respiratory Tract

Prolonged (Chronic) Health Effects

Carcinogenicity:	The International Agency for Research on Cancer (IARC) has classified this product or a component of this product as a Group 3 substance, Unclassifiable as to Its Carcinogenicity to Humans.
Reproductive and Developmental Toxicity:	Not known or reported to cause reproductive or developmental toxicity.
Inhalation:	There are no known or reported effects from chronic exposure except for effects similar to those experienced from acute exposure.
Skin Contact:	There are no known or reported effects from chronic exposure except for effects (if any) similar to those experienced from acute exposure.
Ingestion:	There are no known or reported effects from chronic ingestion except for effects similar to those experienced from single exposure.
Sensitization:	This product has not been tested. However based on similar structured materials, this product is not expected to cause allergic skin sensitization.
Chronic Target Organ Toxicity:	Eyes
Supplemental Health Hazard Information :	No additional health information available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

CAS OR CHEMICAL NAME	CAS #	% RANGE
Water	7732-18-5	72.50 -
HYDROGEN PEROXIDE (H2O2)	7722-84-1	27.50 -

4. FIRST AID MEASURES

Inhalation:	IF INHALED: Remove individual to fresh air. Seek medical attention if breathing becomes difficult or if respiratory irritation develops. If not breathing, give artificial respiration. Call for medical assistance.
Skin Contact:	IF ON SKIN: Flush skin with water for 15 minutes. Take off all contaminated clothing. Seek medical attention if irritation develops.

Eye Contact:	IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention immediately.
Ingestion:	IF SWALLOWED: Call a physician immediately. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flammability Summary (OSHA):	Product is not known to be flammable, combustible, pyrophoric or explosive.
Flammable Properties	
Flash Point:	Not applicable
Autoignition Temperature:	Not applicable
Fire / Explosion Hazards:	Material will not ignite or burn. Oxygen is a decomposition product of hydrogen peroxide. The generation of oxygen will increase the burning rate or ignitable materials.
Extinguishing Media:	Water spray
Fire Fighting Instructions:	In case of fire, use normal fire-fighting equipment and the personal protective equipment recommended in Section 8 to include a NIOSH approved self-contained breathing apparatus. Use water to cool containers.
Hazardous Combustion Products:	Oxygen
Upper Flammable / Explosive Limit, % in air:	No data
Lower Flammable / Explosive Limit, % in air:	No data

6. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations:	Use the personal protective equipment recommended in Section 8 and a NIOSH approved self-contained breathing apparatus.
Spill Mitigation Procedures	
Air Release:	Vapors may be suppressed by the use of water fog. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.
Water Release:	This material is heavier than water. This material is soluble in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so.
Land Release:	Contain spilled liquid with sand or earth. DO NOT use combustible materials such as sawdust. Dilute spilled material with large amounts of water. Do not place spill materials back in their original containers. Place in containers compatible for this material in a liquid form. After removal, flush contaminated area thoroughly with water.
Additional Spill Information :	Hazardous concentrations in air may be found in local spill area and immediately downwind. Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel.



7. HANDLING AND STORAGE

Handling:	Do not take internally. Avoid contact with eyes, skin, and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing mist or vapor.
Storage:	Keep product tightly sealed in original containers. Store product in a cool, dry, well-ventilated area. Store away from combustible or flammable products. Keep product pacakging clean and free of all contamination, including, e.g. other pool treatment products, acids, organic materials, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc.
Incompatible Materials for Storage:	Violent, catalytic decomposition will occur in contact with certain metals, such as iron, copper, chromium, brass, bronze, lead, silver, manganese, or their salts. Decomposed by alkalies and even ordinary dust or rust. Bases Reducing agents alcohols Permanganates
Empty Container Warning:	Empty containers retain product residue (liquid and/or vapor) and can be dangerous.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation:	Local exhaust ventilation or other engineering controls are normally required when handling or using this product to keep airborne exposures below the TLV, PEL or other recommended exposure limit.

Protective Equipment for Routine Use of Product

Respiratory Protection :	Wear a NIOSH approved respirator if levels above the exposure limits are possible. NIOSH approved full-face positive pressure supplied-air respirator
Skin Protection :	Wear impervious gloves to avoid skin contact.
Eye Protection:	Use chemical goggles and a faceshield. Emergency eyewash should be provided in the immediate work area.
Protective Clothing Type:	Butyl rubber, Natural rubber, Nitrile, VitonTM

Exposure Limit Data

CHEMICAL NAME	CAS #	Name of Limit	Exposure
HYDROGEN PEROXIDE (H2O2)	7722-84-1	ACGIH	1 ppm TWA
HYDROGEN PEROXIDE (H2O2)	7722-84-1	OSHA Z1	1 ppm PEL 1.4 mg/m3 PEL
HYDROGEN PEROXIDE (H2O2)	7722-84-1	NIOSH-IDLH	75 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	liquid,
Form	liquid

Color:	colorless
Odor:	None
Molecular Weight:	34.00
Specific Gravity :	1.1000
pH :	2.7
Boiling Point:	104 °C / 219 °F
Freezing Point:	-26 °C / -14 °F
Melting Point:	-40 °C / -40 °F
Density:	No data.
Vapor Pressure:	186.70000000 hPa
Vapor Density:	No data
Viscosity:	No data
Fat Solubility:	No data
Solubility in Water:	soluble
Partition coefficient n-octanol/water:	Not applicable
Evaporation Rate:	No data
Oxidizing:	Oxidizer
Volatiles, % by vol.:	100.000%
VOC Content	Not applicable
HAP Content	Not applicable

10. STABILITY AND REACTIVITY

Stability and Reactivity Summary:	May become unstable at elevated temperatures and/or pressure. Not sensitive to mechanical shock. Not sensitive to static discharge.
Conditions to Avoid:	Contamination, Avoid concentrating the hydrogen peroxide. Concentrated hydrogen peroxide solutions are reactive, often violently, with a wide range of inorganic and organic chemicals., Sparks, open flame, other ignition sources, and elevated temperatures.
Chemical Incompatibility:	strong reducing agents, Contact with combustible materials may cause a fire., copper & copper alloys, ferrous metals, brass, Bases
Hazardous Decomposition Products:	Oxygen is a decomposition product of hydrogen peroxide. The generation of oxygen will increase the burning rate or ignitable materials.
Decomposition Temperature:	No data

11. TOXICOLOGICAL INFORMATION

Component Animal Toxicology

Oral LD50 value:

HYDROGEN PEROXIDE (H2O2)	LD50 (35% Hydrogen Peroxide) = 1,232 mg/kg Rat

Dermal LD50 value:

HYDROGEN PEROXIDE (H2O2)	LD50 (35% Hydrogen Peroxide) > 2,000 mg/kg Rabbit

Inhalation LC50 value:

HYDROGEN PEROXIDE (H2O2)	Inhalation LC50 8 HOUR (90% Hydrogen Peroxide) > 2,000 ppm Rat

HYDROGEN PEROXIDE (H2O2)	Inhalation LC50 4 HOUR (50% Hydrogen Peroxide) > 0.17 MG/L Rat

Product Animal Toxicity

Oral LD50 value:	LD50 Believed to be, 3 - 4 g/kg Rat
Dermal LD50 value:	LD50 Believed to be > 2,000 mg/kg Rabbit
Inhalation LC50 value:	No data.
Skin Irritation:	Moderate Skin Irritant
Eye Irritation:	Corrosive to eyes.
Skin Sensitization:	Not a Skin Senstizer
Acute Toxicity:	Irritating to skin and corrosive to eyes, respiratory tract and gastrointestinal tract.
Subchronic / Chronic Toxicity:	There are no known or reported effects from chronic exposure.

Reproductive and Developmental Toxicity: This chemical is not known or reported to affect reproductive function or fetal development.

HYDROGEN PEROXIDE (H2O2)	Not known or reported to cause reproductive or developmental toxicity.

Mutagenicity: This product has been tested for mutagenicity. Tests revealed both positive and negative results. Based on the weight of evidence, we judge this product NOT to be a mutagenic hazard.

HYDROGEN PEROXIDE (H2O2)	This product has been tested for mutagenicity. Tests revealed both positive and negative results. Based on the weight of evidence, we judge this product NOT to be a mutagenic hazard.

Carcinogenicity: The International Agency for Research on Cancer (IARC) has classified this product or a component of this product as a Group 3 substance, Unclassifiable as to Its Carcinogenicity to Humans.

HYDROGEN PEROXIDE (H2O2)	The International Agency for Research on Cancer (IARC) has classified this product or a component of this product as a Group 3 substance, Unclassifiable as to Its Carcinogenicity to Humans.

12. ECOLOGICAL INFORMATION

Overview: Moderately toxic to fish and other aquatic organisms.

Ecological Toxicity Values for: **HYDROGEN PEROXIDE (H2O2)**

Fathead minnow (Pimephales promelas),	-	96 HOUR LC50 = 16.4 mgl
Channel Catfish (Ictalurus punctatus rafinesque),	-	96 HOUR LC50 = 37.4 mgl
Rainbow trout (Salmo gairdneri),	-	48 HOUR Lethal > 40 mgl
Daphnia magna,	-	24 HOUR EC50= 7.7 mgl
Daphnia pulex	-	48 HOUR LC50= 2.4 mgl

13. DISPOSAL CONSIDERATIONS

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THE MATERIAL. THE USER OF THE MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

Waste Disposal Summary :	If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number: D001.
Disposal Methods :	As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by treatment or incineration.
Potential US EPA Waste Codes :	D001

14. TRANSPORT INFORMATION

Land (US DOT): UN2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTION 5.1 8 II
Water (IMDG): UN2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTION, 5.1 8 II

Flash Point: Not applicable
Air (IATA): UN2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTION, 5.1 8 II
Emergency Response Guide Number: ERG # 140

15. REGULATORY INFORMATION

UNITED STATES:

Toxic Substances Control Act (TSCA):	The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.
EPA Pesticide Registration Number:	NOT APPLICABLE
FIFRA Listing of Pesticide Chemicals (40 CFR 180):	Not registered in the US under FIFRA.

Superfund Amendments and Reauthorization Act (SARA) Title III:

Hazard Categories Sections 311 / 312 (40 CFR 370.2):

Health	Immediate (Acute) Health Hazard
Physical	Fire Hazard

Emergency Planning & Community Right to Know (40 CFR 355, App. A):

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:

SARA III Threshold Planning Quantity: HYDROGEN PEROXIDE (CONC >52%)
Value: 1,000lbs

Reportable Quantity (49 CFR 172.101, Appendix):

CERCLA		None established
SARA III	Reportable quantity:	HYDROGEN PEROXIDE (CONC >52%) Value: 1,000lbs

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components

SARA III	De minimis concentration:	None established

Clean Air Act Toxic ARP Section 112r:

CAA 112R	None established

Clean Air Act Socmi:

HON SOC	None established

Clean Air Act VOC Section 111:

CAA 111	None established

Clean Air Act Haz. Air Pollutants Section 112:

CAA	None established
CAA 112I	None established
CAA AP	None established

State Right-to-Know Regulations Status of Ingredients

Pennsylvania:

CAS #	COMPONENT NAME
7722-84-1	HYDROGEN PEROXIDE (H2O2)

PENN RTK

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)
PENN RTK
08 1989
HYDROGEN PEROXIDE (CONC > 52 PERCENT)

New Jersey:

CAS #	COMPONENT NAME
7722-84-1	HYDROGEN PEROXIDE (H2O2)

NJ RTK

US. New Jersey Community Right-To-Know Survey, Table A: NJ Environmental Hazardous Substances [EHS] List (N.J. Admin. Code Title 7 Section 1G-2.1)
NJ RTK
2001
Substance no. 1015
HYDROGEN PEROXIDE (> 52% CONCENTRATION)

Massachusetts:

CAS #	COMPONENT NAME

7722-84-1	HYDROGEN PEROXIDE (H2O2)

MASS RTK

US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

MASS RTK
04 1993
HYDROGEN PEROXIDE

California Proposition 65:

CAS #	COMPONENT NAME
US CA CRT	None established
US CA65CRT	None established

WHMIS Hazard Classification:

WHMIS

Canada. Canadian Environmental Protection Act (CEPA). WHMIS Ingredient Disclosure List (Can. Gaz., Part II, Vol. 122, No. 2)

WHMIS
01 1988
Threshold limits: 1%
English List no. 849
HYDROGEN PEROXIDE

16. OTHER INFORMATION

MSDS REVISION STATUS : Revised to meet the ANSI standard of 16 sections
Major References : Available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT. .

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Material Safety Data Sheet

BAQUACIL AD Algicide 10

Version 1.2 Print Date 02/26/2005

Issue Date 12/24/2003

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Material Name	:	BAQUACIL AD Algicide 10
Product Code	:	
MSDS Number	:	150000020123
Company	:	**Arch Chemicals, Inc.** 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204
Telephone	:	1-800-511-MSDS
Telefax	:	
Emergency telephone	:	(800) 654-6911 Medical Emergency
		For a transport accident or leak, fire or major spill, call **CHEMICAL EMERGENCY RESPONSE CENTER** (800) 424-9300.

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS*

CAS No. / NJRTK No.*	Wt %	Components
7732-18-5	88.00	Water
67-63-0	2.00	Isopropanol
68391-01-5	9.90	n-Alkyl (c12-c18) dimethyl benzyl ammonium chloride

*Ingredients not precisely identified are either proprietary or non-hazardous; the NJRTK number for the proprietary component(s) is 510390490 (Arch Chemicals, Inc.) or 043574982 (NeoResins) followed by the 4/5 digit code above.

SECTION 3. HAZARDS IDENTIFICATION**

**As defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. See Section 8 for exposure guidelines & Section 11 for toxicology and ingredient specific information.

Emergency Overview

BLUE LIQUID; BENZALDEHYDE-LIKE ODOR;
CORROSIVE TO THE GASTROINTESTINAL TRACT. SKIN IRRITANT.
RESPIRATORY IRRITANT. EYE CORROSIVE.

Potential Health Hazards

Material Safety Data Sheet

BAQUACIL AD Algicide 10

Version 1.2 Print Date 02/26/2005

Issue Date 12/24/2003

Eyes	This product is eye corrosive based on commercially available information.
Skin	This product is a severe skin irritant based on animal studies. The acute dermal toxicity of this product is greater than 1000 mg/kg. This product is not toxic by skin absorption. This product did not induce skin sensitization in an animal study. This product is unlikely to induce skin sensitization in humans.
Ingestion	This material will probably cause chemical burns of the mouth, pharynx, esophagus, and stomach in humans, following ingestion of this material. Injury may be severe and cause death. The acute oral toxicity of this material is between 500 and 5000 mg/kg. Relative to other materials, this material is classified as slightly toxic by ingestion.
Inhalation	Vapors and/or aerosols of this material will probably irritate mucous membranes, eyes, nose, and respiratory passages.
Chronic Exposure	Lower alcohols and ketones can cause central nervous system depression and gastrointestinal disturbances.

SECTION 4. FIRST AID MEASURES

Inhalation
Remove victim to fresh air. If a cough or other respiratory symptoms develop, consult medical personnel.

Skin contact
Remove contaminated clothing and footwear. Wash off skin with plenty of soap and water. Get medical attention. Wash contaminated clothing and decontaminate footwear before reuse.

Eye contact
Immediately flush the eyes with large quantities of running water for a minimum of 15 minutes. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention as soon as possible. Oils or ointments should not be used at this time. Continue the flushing for an additional 15 minutes if a physician is not immediately available.

Ingestion
DO NOT INDUCE VOMITING. Give one or two glasses of water to drink and refer to medical personnel or take direction from either a physician or a poison control center. Never give anything by mouth to an unconscious person.

SECTION 5. FIRE FIGHTING MEASURES

Flammable Properties
Flash point: > 93.34 °C (> 200.01 °F)

Lower explosion limit
Method: Not applicable

Upper explosion limit
Method: Not applicable

Extinguishing agents
Use carbon dioxide, foam, dry chemical, halogenated agents. Water spray may be used to cool containers, but a water stream may spread flames.

Special protective equipment for fire-fighters
Wear self-contained breathing apparatus with full facepiece and full protective clothing. If contact occurs with material or its solutions, immediately flush with water and remove contaminated clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear skin, eye, and respiratory protection during cleanup.

Methods for cleaning up
Contain spill.

Soak up material with absorbent and shovel into a chemical waste container.

SECTION 7. HANDLING AND STORAGE

Handling
Avoid breathing vapors or aerosols.

Prevent skin and eye contact.

Requirements for storage areas and containers
Store in a tightly sealed container away from incompatible materials.

Do not store at temperatures above 60°C (140°F).

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering measures
Use permitted ventilation adequate to maintain safe levels.

Eye protection

Wear chemical tight goggles and full faceshield.

Skin and body protection
Wear gloves, arm covers and apron determined to be impervious under the conditions of use.
Remove contaminated clothing and wash before rewearing.
Wash separately from other laundry.

Respiratory protection
If needed, use NIOSH certified respirator for organic vapors, mists and fumes.

Hygienic measures
Eyewash station and safety shower in work area.

Occupational

Components with workplace control parameters

Components	Source	Type	Value	Remarks
Isopropanol				
	ACGIH	Time Weighted Average (TWA):	400 ppm 983 mg/m3	
	ACGIH	Short Term Exposure Limit (STEL):	500 ppm 1,230 mg/m3	
	NIOSH	Recommended exposure limit (REL):	400 ppm 980 mg/m3	
	NIOSH	Short Term Exposure Limit (STEL):	500 ppm 1,225 mg/m3	
	OSHA Z1	PEL:	400 ppm 980 mg/m3	
	ACGIH	Time Weighted Average (TWA):	200 ppm	
	ACGIH	Short Term Exposure Limit (STEL):	400 ppm	

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form : Liquid

Color : Blue

Odor : Benzaldehyde-like

pH	:	6.5 - 8.5 (Range)
Boiling point	:	101.11 °C (214.00 °F)
Water solubility	:	(Soluble)
Specific Gravity	:	0.9600 @ 25°C

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	:	Stable under normal conditions.
Materials to avoid	:	Strong oxidizers. Reducing agents.
Hazardous decomposition products	:	Carbon oxides. Nitrogen oxides. Hydrogen chloride/Hydrochloric acid. Amines.
Hazardous reactions	:	Not known to occur.

SECTION 11. TOXICOLOGICAL INFORMATION

Skin irritation	:	Severe skin irritant based on animal studies.
Eye irritation	:	Eye corrosive based on commercially available information.
Sensitization	:	Skin: not an animal skin sensitizer based on commercially available information. Respiratory: Non-sensitizing
Repeated dose toxicity	:	Isopropyl alcohol: Adverse clinical reactions to extreme exposure to isopropyl alcohol vapors may include mucous membrane irritation, central nervous system depression, gastrointestinal disturbance, hypotension, and respiratory depression. There are reports that prolonged contact with this component can cause permanent eye injury (blindness). Quats: This product contains a quaternary ammonium compound which, when ingested, can cause immediate burning pain in the mouth and gastrointestinal tract which may progress to circulatory shock, weakness, central nervous depression, convulsions, labored breathing, cyanosis, and death.

Carcinogenicity:

Regulatory List	Chemical	Category / Classification
NTP	N.D.	
IARC	N.D.	
OSHA	N.D.	

SECTION 12. ECOLOGICAL INFORMATION

Additional ecotoxicological remarks : Fish tox (LC50) N-Alkyl(C12-16)-N,N-dimethyl-N-benzylammonium chloride: 2.35 ppm 96 hr bluegill sunfish; 7.8 ppm 96 hr rainbow trout. Bobwhite quail 2700ppm 8 days; mallard duck >4500 8 days. Toxic to aquatic life.

Other : No data.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal method : Discarded product may be a hazardous waste under RCRA. TCLP should be completed prior to disposal.

Container disposal : Empty container retains product residue. Observe all hazard precautions. Do not distribute, make available, furnish or reuse empty container except for storage and shipment of original product. Remove all product residue from container using appropriate solvents (e.g. triple rinsing). Then offer for recycling/ reconditioning or puncture or otherwise destroy empty container before disposal.

SECTION 14. TRANSPORT INFORMATION

Proper shipping name : Not regulated by US DOT

Material Safety Data Sheet

BAQUACIL AD Algicide 10

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SECTION 15. REGULATORY INFORMATION

TSCA (TSCA Substances Control Act)	:	This product is a FIFRA-regulated pesticide and is exempt from TSCA regulation. Do not use for other purposes.
CEPA (Canadian Environmental Protection Act)	:	CEPA (Canadian Environmental Protection Act): All ingredients are on the DSL (Domestic Substances List).
SARA Title III (Emergency Planning and Community Right-To-Know Act)	:	This product does not contain any chemicals subject to the reporting requirements of SARA Section 313.
California Proposition 65	:	WARNING. This product contains a chemical known to State of California to cause cancer and birth defects or other reproductive harm.

SECTION 16. OTHER INFORMATION

Further information:

We assigned NFPA and HMIS ratings to this product based on the hazards of its ingredient(s). Because the customer is most aware of the application of the product, he must ensure that the proper personal protective equipment (PPE) is provided consistent with information contained in the product MSDS.*

NFPA Rating

Health	:	3
Fire	:	1
Reactivity	:	0
Special	:	

HMIS Rating

Health	:	3
Fire	:	1
Reactivity	:	0
** *	:	Chronic Effect

*This information is intended solely for the use of individuals trained in the particular hazard rating system.
**See appropriate MSDS section.

THE PRODUCT NAMES LISTED ARE TRADEMARKS OF ARCH CHEMICALS, INC. OR ITS AFFILIATED COMPANIES.

The information herein is given in good faith but no warranty, expressed or implied, is made.

Material Safety Data Sheet

BAQUACIL AD Algicide 10

Version 1.2 Print Date 02/26/2005

Issue Date 12/24/2003

This MSDS was prepared by the Safety, Health and Environment Group of at 501 Merritt, Norwalk, CT 06856. For further questions, call during regular business hours at 1-800-511-MSDS.

8/8

Arch Chemicals, Inc.

MATERIAL SAFETY DATA SHEET

FOR ANY EMERGENCY, 24 HOURS / 7 DAYS, CALL:	1-800-654-6911
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL:	1-800-511-MSDS

PRODUCT NAME: **BAQUACIL Oxidizer**
EPA Registration Number: NOT APPLICABLE

1. PRODUCT AND COMPANY IDENTIFICATION

Arch Chemicals, Inc.
501 Merritt 7 PO Box 5204
Norwalk, CT 06856-5204

REVISION DATE:	12/13/2005
SUPERCEDES:	12/13/2005
MSDS Number:	000000001740
SYNONYMS:	Dihydrogen dioxide (solution)
CHEMICAL FAMILY:	Hydrogen peroxide
DESCRIPTION / USE:	Swimming pool oxidizer
FORMULA:	None established

2. HAZARDS IDENTIFICATION

OSHA Hazard Classification:	**Oxidizer, Corrosive to eyes., Corrosive to respiratory tract., Corrosive to gastrointestinal tract, Skin irritant**

Routes of Entry:	Inhalation, skin, eyes, ingestion
Chemical Interactions:	Oxidizer and will react with many substances in the body.
Medical Conditions Aggravated:	Pre-existing eye disease, Respiratory diseases including asthma and bronchitis, Dermatitis may be aggravated following exposure.

Human Threshold Response Data

Odor Threshold
HYDROGEN PEROXIDE (H2O2) Not established.
Irritation Threshold
HYDROGEN PEROXIDE (H2O2) 150 mg/m3

Hazardous Materials Identification System / National Fire Protection Association Classifications

Hazard Ratings :	Health	Flammability	Physical / Instability	PPI / Special hazard.
HMIS	3	0	1	
NFPA	3	0	1	Oxidizer

Immediate (Acute) Health Effects

Inhalation Toxicity:	Inhalation of mist or vapor may cause irritation and/or burns to the mucous membranes of the respiratory tract.
Skin Toxicity:	Not expected to be absorbed through the skin. Moderate Skin Irritant

Eye Toxicity:	Corrosive. Burns can occur following exposure. Direct contact may cause impairment of vision, corneal damage and/or blindness. Rinsing of the eye should take place immediately.
Ingestion Toxicity:	Harmful if swallowed. Irritation and/or burns can occur to the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding, and/or tissue ulceration. Ingestion may cause severe damage to the gastrointestinal tract with the potential to cause perforation. May cause rapid release of oxygen which may expand the esophagus or stomach resulting in severe damage.
Acute Target Organ Toxicity:	Eyes, Skin, Digestive Tract, Respiratory Tract

Prolonged (Chronic) Health Effects

Carcinogenicity:	The International Agency for Research on Cancer (IARC) has classified this product or a component of this product as a Group 3 substance, Unclassifiable as to Its Carcinogenicity to Humans.
Reproductive and Developmental Toxicity:	Not known or reported to cause reproductive or developmental toxicity.
Inhalation:	There are no known or reported effects from chronic exposure except for effects similar to those experienced from acute exposure.
Skin Contact:	There are no known or reported effects from chronic exposure except for effects (if any) similar to those experienced from acute exposure.
Ingestion:	There are no known or reported effects from chronic ingestion except for effects similar to those experienced from single exposure.
Sensitization:	This product has not been tested. However based on similar structured materials, this product is not expected to cause allergic skin sensitization.
Chronic Target Organ Toxicity:	Eyes
Supplemental Health Hazard Information :	No additional health information available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

CAS OR CHEMICAL NAME	CAS #	% RANGE
Water	7732-18-5	72.50 -
HYDROGEN PEROXIDE (H2O2)	7722-84-1	27.50 -

4. FIRST AID MEASURES

Inhalation:	IF INHALED: Remove individual to fresh air. Seek medical attention if breathing becomes difficult or if respiratory irritation develops. If not breathing, give artificial respiration. Call for medical assistance.
Skin Contact:	IF ON SKIN: Flush skin with water for 15 minutes. Take off all contaminated clothing. Seek medical attention if irritation develops.

Eye Contact:	IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention immediately.
Ingestion:	IF SWALLOWED: Call a physician immediately. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flammability Summary (OSHA):	Product is not known to be flammable, combustible, pyrophoric or explosive.
Flammable Properties	
Flash Point:	Not applicable
Autoignition Temperature:	Not applicable
Fire / Explosion Hazards:	Material will not ignite or burn. Oxygen is a decomposition product of hydrogen peroxide. The generation of oxygen will increase the burning rate or ignitable materials.
Extinguishing Media:	Water spray
Fire Fighting Instructions:	In case of fire, use normal fire-fighting equipment and the personal protective equipment recommended in Section 8 to include a NIOSH approved self-contained breathing apparatus. Use water to cool containers.
Hazardous Combustion Products:	Oxygen
Upper Flammable / Explosive Limit, % in air:	No data
Lower Flammable / Explosive Limit, % in air:	No data

6. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations:	Use the personal protective equipment recommended in Section 8 and a NIOSH approved self-contained breathing apparatus.
Spill Mitigation Procedures	
Air Release:	Vapors may be suppressed by the use of water fog. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.
Water Release:	This material is heavier than water. This material is soluble in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so.
Land Release:	Contain spilled liquid with sand or earth. DO NOT use combustible materials such as sawdust. Dilute spilled material with large amounts of water. Do not place spill materials back in their original containers. Place in containers compatible for this material in a liquid form. After removal, flush contaminated area thoroughly with water.
Additional Spill Information :	Hazardous concentrations in air may be found in local spill area and immediately downwind. Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel.

7. HANDLING AND STORAGE

Handling:	Do not take internally. Avoid contact with eyes, skin, and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing mist or vapor.
Storage:	Keep product tightly sealed in original containers. Store product in a cool, dry, well-ventilated area. Store away from combustible or flammable products. Keep product pacakging clean and free of all contamination, including, e.g. other pool treatment products, acids, organic materials, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc.
Incompatible Materials for Storage:	Violent, catalytic decomposition will occur in contact with certain metals, such as iron, copper, chromium, brass, bronze, lead, silver, manganese, or their salts. Decomposed by alkalies and even ordinary dust or rust. Bases Reducing agents alcohols Permanganates
Empty Container Warning:	Empty containers retain product residue (liquid and/or vapor) and can be dangerous.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation:	Local exhaust ventilation or other engineering controls are normally required when handling or using this product to keep airborne exposures below the TLV, PEL or other recommended exposure limit.

Protective Equipment for Routine Use of Product

Respiratory Protection :	Wear a NIOSH approved respirator if levels above the exposure limits are possible. NIOSH approved full-face positive pressure supplied-air respirator
Skin Protection :	Wear impervious gloves to avoid skin contact.
Eye Protection:	Use chemical goggles and a faceshield. Emergency eyewash should be provided in the immediate work area.
Protective Clothing Type:	Butyl rubber, Natural rubber, Nitrile, VitonTM

Exposure Limit Data

CHEMICAL NAME	CAS #	Name of Limit	Exposure
HYDROGEN PEROXIDE (H2O2)	7722-84-1	ACGIH	1 ppm TWA
HYDROGEN PEROXIDE (H2O2)	7722-84-1	OSHA Z1	1 ppm PEL 1.4 mg/m3 PEL
HYDROGEN PEROXIDE (H2O2)	7722-84-1	NIOSH-IDLH	75 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	liquid,
Form	liquid

Color:	colorless
Odor:	None
Molecular Weight:	34.00
Specific Gravity :	1.1000
pH :	2.7
Boiling Point:	104 °C / 219 °F
Freezing Point:	-26 °C / -14 °F
Melting Point:	-40 °C / -40 °F
Density:	No data.
Vapor Pressure:	186.70000000 hPa
Vapor Density:	No data
Viscosity:	No data
Fat Solubility:	No data
Solubility in Water:	soluble
Partition coefficient n-octanol/water:	Not applicable
Evaporation Rate:	No data
Oxidizing:	Oxidizer
Volatiles, % by vol.:	100.000%
VOC Content	Not applicable
HAP Content	Not applicable

10. STABILITY AND REACTIVITY

Stability and Reactivity Summary:	May become unstable at elevated temperatures and/or pressure. Not sensitive to mechanical shock. Not sensitive to static discharge.
Conditions to Avoid:	Contamination, Avoid concentrating the hydrogen peroxide. Concentrated hydrogen peroxide solutions are reactive, often violently, with a wide range of inorganic and organic chemicals., Sparks, open flame, other ignition sources, and elevated temperatures.
Chemical Incompatibility:	strong reducing agents, Contact with combustible materials may cause a fire., copper & copper alloys, ferrous metals, brass, Bases
Hazardous Decomposition Products:	Oxygen is a decomposition product of hydrogen peroxide. The generation of oxygen will increase the burning rate or ignitable materials.
Decomposition Temperature:	No data

11. TOXICOLOGICAL INFORMATION

Component Animal Toxicology

Oral LD50 value:

HYDROGEN PEROXIDE (H2O2) LD50 (35% Hydrogen Peroxide) = 1,232 mg/kg Rat

Dermal LD50 value:

HYDROGEN PEROXIDE (H2O2) LD50 (35% Hydrogen Peroxide) > 2,000 mg/kg Rabbit

Inhalation LC50 value:

HYDROGEN PEROXIDE (H2O2) Inhalation LC50 8 HOUR (90% Hydrogen Peroxide) > 2,000 ppm Rat

HYDROGEN PEROXIDE (H2O2) Inhalation LC50 4 HOUR (50% Hydrogen Peroxide) > 0.17 MG/L Rat

Product Animal Toxicity

Oral LD50 value:	LD50 Believed to be, 3 - 4 g/kg Rat
Dermal LD50 value:	LD50 Believed to be > 2,000 mg/kg Rabbit
Inhalation LC50 value:	No data.
Skin Irritation:	Moderate Skin Irritant
Eye Irritation:	Corrosive to eyes.
Skin Sensitization:	Not a Skin Senstizer
Acute Toxicity:	Irritating to skin and corrosive to eyes, respiratory tract and gastrointestinal tract.
Subchronic / Chronic Toxicity:	There are no known or reported effects from chronic exposure.

Reproductive and Developmental Toxicity: This chemical is not known or reported to affect reproductive function or fetal development.

HYDROGEN PEROXIDE (H2O2) Not known or reported to cause reproductive or developmental toxicity.

Mutagenicity: This product has been tested for mutagenicity. Tests revealed both positive and negative results. Based on the weight of evidence, we judge this product NOT to be a mutagenic hazard.

HYDROGEN PEROXIDE (H2O2) This product has been tested for mutagenicity. Tests revealed both positive and negative results. Based on the weight of evidence, we judge this product NOT to be a mutagenic hazard.

Carcinogenicity: The International Agency for Research on Cancer (IARC) has classified this product or a component of this product as a Group 3 substance, Unclassifiable as to Its Carcinogenicity to Humans.

HYDROGEN PEROXIDE (H2O2) The International Agency for Research on Cancer (IARC) has classified this product or a component of this product as a Group 3 substance, Unclassifiable as to Its Carcinogenicity to Humans.

12. ECOLOGICAL INFORMATION

Overview: Moderately toxic to fish and other aquatic organisms.

Ecological Toxicity Values for: **HYDROGEN PEROXIDE (H2O2)**

Fathead minnow (Pimephales promelas),	-	96 HOUR LC50 = 16.4 mgl
Channel Catfish (Ictalurus punctatus rafinesque),	-	96 HOUR LC50 = 37.4 mgl
Rainbow trout (Salmo gairdneri),	-	48 HOUR Lethal > 40 mgl
Daphnia magna,	-	24 HOUR EC50= 7.7 mgl
Daphnia pulex	-	48 HOUR LC50= 2.4 mgl



MATERIAL SAFETY DATA SHEET

13. DISPOSAL CONSIDERATIONS

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THE MATERIAL. THE USER OF THE MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

Waste Disposal Summary :	If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number: D001.
Disposal Methods :	As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by treatment or incineration.
Potential US EPA Waste Codes :	D001

14. TRANSPORT INFORMATION

Land (US DOT): UN2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTION 5.1 8 II
Water (IMDG): UN2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTION, 5.1 8 II

Flash Point: Not applicable
Air (IATA): UN2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTION, 5.1 8 II
Emergency Response Guide Number: ERG # 140

15. REGULATORY INFORMATION

UNITED STATES:

Toxic Substances Control Act (TSCA):	The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.
EPA Pesticide Registration Number:	NOT APPLICABLE
FIFRA Listing of Pesticide Chemicals (40 CFR 180):	Not registered in the US under FIFRA.

Superfund Amendments and Reauthorization Act (SARA) Title III:

Hazard Categories Sections 311 / 312 (40 CFR 370.2):

Health	Immediate (Acute) Health Hazard
Physical	Fire Hazard

Emergency Planning & Community Right to Know (40 CFR 355, App. A):

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:
SARA III Threshold Planning Quantity: HYDROGEN PEROXIDE (CONC >52%) Value: 1,000lbs

Reportable Quantity (49 CFR 172.101, Appendix):

CERCLA		None established
SARA III	Reportable quantity:	HYDROGEN PEROXIDE (CONC >52%) Value: 1,000lbs

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components

SARA III	De minimis concentration:	None established

Clean Air Act Toxic ARP Section 112r:

CAA 112R	None established

Clean Air Act Socmi:

HON SOC	None established

Clean Air Act VOC Section 111:

CAA 111	None established

Clean Air Act Haz. Air Pollutants Section 112:

CAA	None established
CAA 112I	None established
CAA AP	None established

State Right-to-Know Regulations Status of Ingredients

Pennsylvania:

CAS #	COMPONENT NAME
7722-84-1	HYDROGEN PEROXIDE (H2O2)

PENN RTK

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)
PENN RTK
08 1989
HYDROGEN PEROXIDE (CONC > 52 PERCENT)

New Jersey:

CAS #	COMPONENT NAME
7722-84-1	HYDROGEN PEROXIDE (H2O2)

NJ RTK

US. New Jersey Community Right-To-Know Survey, Table A: NJ Environmental Hazardous Substances [EHS] List (N.J. Admin. Code Title 7 Section 1G-2.1)
NJ RTK
2001
Substance no. 1015
HYDROGEN PEROXIDE (> 52% CONCENTRATION)

Massachusetts:

CAS #	COMPONENT NAME

7722-84-1	HYDROGEN PEROXIDE (H2O2)

MASS RTK

US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

MASS RTK
04 1993
HYDROGEN PEROXIDE

California Proposition 65:

CAS #	COMPONENT NAME
US CA CRT	None established
US CA65CRT	None established

WHMIS Hazard Classification:

WHMIS

Canada. Canadian Environmental Protection Act (CEPA). WHMIS Ingredient Disclosure List (Can. Gaz., Part II, Vol. 122, No. 2)

WHMIS
01 1988
Threshold limits: 1%
English List no. 849
HYDROGEN PEROXIDE

16. OTHER INFORMATION

MSDS REVISION STATUS : Revised to meet the ANSI standard of 16 sections
Major References : Available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT. .

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Arch Chemicals, Inc.

MATERIAL SAFETY DATA SHEET

FOR ANY EMERGENCY, 24 HOURS / 7 DAYS, CALL:	1-800-654-6911
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL:	1-800-511-MSDS

PRODUCT NAME: **BAQUACIL pH Decreaser**

1. PRODUCT AND COMPANY IDENTIFICATION

Arch Chemicals, Inc.
501 Merritt 7 PO Box 5204
Norwalk, CT 06856-5204

REVISION DATE:	12/13/2006
SUPERCEDES:	03/10/2006
MSDS Number:	000000002193
SYNONYMS:	Dry acid
CHEMICAL FAMILY:	Sulfate
DESCRIPTION / USE:	pH and alkalinity adjuster for swimming pools
FORMULA:	NaHSO4

2. HAZARDS IDENTIFICATION

OSHA Hazard Classification:	**Corrosive to eyes and irritating to respiratory tract and gastrointestinal tract., Moderate Skin Irritant**

Routes of Entry:	Inhalation, skin, eyes, ingestion
Chemical Interactions:	No known interactions
Medical Conditions Aggravated:	Asthma, respiratory and cardiovascular disease, Skin diseases including eczema and sensitization

Human Threshold Response Data

Odor Threshold	Not established.
Irritation Threshold	Not established.

Hazardous Materials Identification System / National Fire Protection Association Classifications

Hazard Ratings :	Health	Flammability	Physical / Instability	PPI / Special hazard.
HMIS	3	0	0	
NFPA	Not established			

Immediate (Acute) Health Effects

Inhalation Toxicity:	May cause respiratory irritation.
Skin Toxicity:	Moderate Skin Irritant
Eye Toxicity:	Corrosive to eyes.

Ingestion Toxicity:	Irritation and/or burns can occur to the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding, and/or tissue ulceration. Ingestion may cause severe damage to the gastrointestinal tract with the potential to cause perforation.
Acute Target Organ Toxicity:	Eyes, Skin, Digestive Tract, Lungs

Prolonged (Chronic) Health Effects

Carcinogenicity:	This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.
Reproductive and Developmental Toxicity:	Not known or reported to cause reproductive or developmental toxicity.
Inhalation:	There are no known or reported effects from chronic exposure except for effects similar to those experienced from acute exposure.
Skin Contact:	There are no known or reported effects from chronic exposure except for effects (if any) similar to those experienced from acute exposure.
Skin Absorption:	There are no known or reported effects from chronic exposure.
Ingestion:	There are no known or reported effects from chronic ingestion except for effects similar to those experienced from single exposure. The acute corrosivity of this product, makes chronic ingestion of significant amounts unlikely.
Sensitization:	This material is not known or reported to be a skin or respiratory sensitizer.
Chronic Target Organ Toxicity:	There are no known or reported target organ effects from chronic exposure.
Supplemental Health Hazard Information :	No additional health information available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

CAS OR CHEMICAL NAME	CAS #	% RANGE
SULFURIC ACID, MONOSODIUM SALT	7681-38-1	91.5 - 94.7
SULFURIC ACID DISODIUM SALT	7757-82-6	4.8 - 8.0
Water	7732-18-5	0.1 - 0.5

4. FIRST AID MEASURES

Inhalation:	IF INHALED: Remove individual to fresh air. Seek medical attention if breathing becomes difficult or if respiratory irritation develops. If not breathing, give artificial respiration. Call for medical assistance.

Skin Contact:	IF ON SKIN: Immediately flush skin with plenty of water for 15 minutes. If clothing comes in contact with the product, the clothing should be removed immediately and laundered before re-use. Seek medical attention.
Eye Contact:	IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention immediately.
Ingestion:	IF SWALLOWED: Call a physician immediately. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flammability Summary (OSHA):	Product is not known to be flammable, combustible, pyrophoric or explosive.
Flammable Properties	
Flash Point:	Not applicable
Autoignition Temperature:	Not applicable
Fire / Explosion Hazards:	Material will not ignite or burn.
Extinguishing Media:	Not Applicable. - Choose extinguishing media suitable for surrounding materials.
Fire Fighting Instructions:	In case of fire, use normal fire-fighting equipment and the personal protective equipment recommended in Section 8 to include a NIOSH approved self-contained breathing apparatus.
Hazardous Combustion Products:	Carbon monoxide, Carbon dioxide
Upper Flammable / Explosive Limit, % in air:	Not applicable
Lower Flammable / Explosive Limit, % in air:	Not applicable

6. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations:	Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to boots, impervious gloves, hard hat, splash-proof goggles, impervious clothing, i.e., chemically impermeable suit, self-contained breathing apparatus.
Spill Mitigation Procedures	
Air Release:	Vapors may be suppressed by the use of water fog.
Water Release:	Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so. Contain all solids for treatment or disposal.
Land Release:	Sweep up and place in suitable clean, dry containers for reclamation or later disposal. Do not place spill materials back in their original containers.
Additional Spill Information :	Stop source of spill as soon as possible and notify appropriate personnel. Utilize emergency response personal protection equipment prior to the start of any response. Evacuate all non-essential personnel. Dispose of spill residues per guidelines under Section 13, Disposal Consideration.

7. HANDLING AND STORAGE

Handling:	Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing dust from this material.
Storage:	Store in a cool dry ventilated location, away from sources of ignition or other incompatible conditions and chemicals. Keep container(s) closed. Avoid contact with water, or moist air.
Incompatible Materials for Storage:	strong alkalies
Do Not Store At temperatures Above:	175 °C / 347 °F

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation:	Local exhaust ventilation is recommended if vapors, mists, aerosols or dusts are generated. Otherwise, use general exhaust ventilation.

Protective Equipment for Routine Use of Product

Respiratory Protection :	If vapors, mists or aerosols are generated, wear a NIOSH approved respirator.
Respirator Type :	Wear a NIOSH approved N95 respirator.
Skin Protection :	Wear impervious gloves to avoid skin contact.
Eye Protection:	Use chemical goggles and a faceshield. An eye wash and safety shower should be provided in the immediate work area.
Protective Clothing Type:	Butyl rubber

Exposure Limit Data

CHEMICAL NAME	CAS #	Name of Limit	Exposure
No Data Found			

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	solid
Form	granular
Color:	off-white
Odor:	pungent
Molecular Weight:	120.00
Specific Gravity :	2.7400
pH :	< 1.0 @ 5% aqueous solution
Boiling Point:	Not applicable
Freezing Point:	Not applicable
Melting Point:	177 °C / 350 °F
Density:	No data.
Vapor Pressure:	Not applicable
Vapor Density:	Not applicable
Viscosity:	No data
Fat Solubility:	No data
Solubility in Water:	1080.00000 gm/l 68.00 °F

Partition coefficient n-octanol/water:	Not applicable
Evaporation Rate:	Not applicable
Oxidizing:	No data
Volatiles, % by vol.:	Not applicable
VOC Content	Not applicable
HAP Content	Not applicable

10. STABILITY AND REACTIVITY

Stability and Reactivity Summary:	Stable under normal conditions. Not sensitive to mechanical shock. Not sensitive to static discharge. Product will not undergo hazardous polymerization.
Conditions to Avoid:	Sparks, open flame, other ignition sources, and elevated temperatures.
Chemical Incompatibility:	acids, Bases, oxidizers
Hazardous Decomposition Products:	Sulfur oxides
Decomposition Temperature:	315 °C - , 599 °F-

11. TOXICOLOGICAL INFORMATION

Component Animal Toxicology

Oral LD50 value:

SULFURIC ACID, MONOSODIUM SALT	LD50 Believed to be 2,800 mg/kg Rat
SULFURIC ACID DISODIUM SALT	LD50 = 5,989 mg/kg Mouse

Dermal LD50 value:

SULFURIC ACID, MONOSODIUM SALT	No data
SULFURIC ACID DISODIUM SALT	No data

Inhalation LC50 value:

SULFURIC ACID, MONOSODIUM SALT	No data
SULFURIC ACID DISODIUM SALT	No data

Product Animal Toxicity

Oral LD50 value:	LD50 Believed to be > 3,000 mg/kg Rat
Dermal LD50 value:	LD50 Believed to be > 2,000 mg/kg Rabbit
Inhalation LC50 value:	No data
Skin Irritation:	Moderate Skin Irritant
Eye Irritation:	Corrosive to eyes.
Skin Sensitization:	This material is not known or reported to be a skin or respiratory sensitizer.
Acute Toxicity:	Corrosive to eyes and irritating to respiratory tract and gastrointestinal tract.possible skin irritant
Subchronic / Chronic Toxicity:	Not known or reported to cause subchronic or chronic toxicity.

Reproductive and Developmental Toxicity:	This chemical is not known or reported to affect reproductive function or fetal development.
Mutagenicity:	Not known or reported to be mutagenic.
Carcinogenicity:	This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

12. ECOLOGICAL INFORMATION

Overview: Toxic to fish and other aquatic organisms.

13. DISPOSAL CONSIDERATIONS

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THE MATERIAL. THE USER OF THE MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

Waste Disposal Summary :	If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D.
Disposal Methods :	As a nonhazardous liquid waste, it should be disposed of in accordance with local, state and federal regulations.
Potential US EPA Waste Codes :	Not applicable

14. TRANSPORT INFORMATION

Land (US DOT): NOT REGULATED AS A DOT HAZARDOUS MATERIAL
Water (IMDG): NOT REGULATED AS A HAZARDOUS MATERIAL,

Flash Point: Not applicable
Air (IATA): NOT REGULATED AS A HAZARDOUS MATERIAL,
Emergency Response Guide Number: Not applicable

15. REGULATORY INFORMATION

UNITED STATES:

Toxic Substances Control Act (TSCA):	The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.
EPA Pesticide Registration Number:	None established
FIFRA Listing of Pesticide Chemicals	Not registered in the US under FIFRA.

(40 CFR 180):

Superfund Amendments and Reauthorization Act (SARA) Title III:

Hazard Categories Sections 311 / 312 (40 CFR 370.2):
Health — Immediate (Acute) Health Hazard
Physical — None

Emergency Planning & Community Right to Know (40 CFR 355, App. A):

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:
SARA III — Threshold Planning Quantity: None established

Reportable Quantity (49 CFR 172.101, Appendix):
CERCLA — None established
SARA III — Reportable quantity: None established

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components

SARA III — De minimis concentration: None established

Clean Air Act Toxic ARP Section 112r:
CAA 112R — None established

Clean Air Act Socmi:
HON SOC — None established

Clean Air Act VOC Section 111:
CAA 111 — None established

Clean Air Act Haz. Air Pollutants Section 112:
CAA — None established

CAA 112I — None established

CAA AP — None established

State Right-to-Know Regulations Status of Ingredients
Pennsylvania:

CAS #	COMPONENT NAME
7757-82-6	SULFURIC ACID DISODIUM SALT

PENN RTK

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)
PENN RTK
08 1989
Hazard Designation:
SODIUM SULFATE, SOLUTION

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)
PENN RTK
08 1989
SODIUM SULFATE, SOLUTION

New Jersey:

CAS #	COMPONENT NAME
NJ RTK	None established

Massachusetts:

CAS #	COMPONENT NAME
7757-82-6	SULFURIC ACID DISODIUM SALT

MASS RTK

US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)
MASS RTK
04 1993
SODIUM SULFATE, SOLUTION

California Proposition 65:

CAS #	COMPONENT NAME
US CA CRT	None established
US CA65CRT	None established

WHMIS Hazard Classification:
WHMIS

Canada. Canadian Environmental Protection Act (CEPA). WHMIS Ingredient Disclosure List (Can. Gaz., Part II, Vol. 122, No. 2)
WHMIS
01 1988
Threshold limits: 1%
English List no. 1426
SODIUM BISULFATE

16. OTHER INFORMATION

MSDS REVISION STATUS :	Revised to meet the ANSI standard of 16 sections
SECTIONS REVISED:	9
Major References :	Available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT. .


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Arch Chemicals, Inc.

MATERIAL SAFETY DATA SHEET

FOR ANY EMERGENCY, 24 HOURS / 7 DAYS, CALL:	1-800-654-6911
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL:	1-800-511-MSDS

PRODUCT NAME: **BAQUACIL pH Increaser**

1. PRODUCT AND COMPANY IDENTIFICATION

Arch Chemicals, Inc.
501 Merritt 7 PO Box 5204
Norwalk, CT 06856-5204

REVISION DATE:	03/20/2007
SUPERCEDES:	
MSDS Number:	100000002193
SYNONYMS:	Soda Ash
CHEMICAL FAMILY:	Carbonate
DESCRIPTION / USE:	pH adjuster for pools and spas
FORMULA:	Na2CO3

2. HAZARDS IDENTIFICATION

OSHA Hazard Classification:	**Skin irritant, Moderate to Severe Eye Irritant, Possible respiratory irritant, Eye and skin hazard, Toxic by inhalation**

Routes of Entry:	Inhalation, skin, eyes, ingestion
Chemical Interactions:	No known or reported interactions.
Medical Conditions Aggravated:	None known or reported

Human Threshold Response Data

Odor Threshold	Not established.
Irritation Threshold	Not established.

Hazardous Materials Identification System / National Fire Protection Association Classifications

Hazard Ratings :	Health	Flammability	Physical / Instability	PPI / Special hazard.
HMIS	2*	0	0	
NFPA	2	0	0	

Immediate (Acute) Health Effects

Inhalation Toxicity: Inhalation of dust may cause irritation to the mucous membranes of the respiratory tract. Any irritation would be transient with no permanent damage expected. Subsequent coughing and shortness of breath may also occur from inhalation of this product. Toxic by inhalation.

Skin Toxicity:	Contact with intact skin may cause slight to mild irritation consisting of reversible redness. Contact with abraded skin may cause moderate irritation consisting of transient redness and swelling. This irritant effect would not be expected to result in permanent damage. Not expected to be toxic from dermal contact.
Eye Toxicity:	May cause moderate to severe irritation, consisting of redness, swelling, and mucous membrane discharge to the conjunctiva. Minor corneal involvement may occur with possible impairment of vision if product is not rinsed immediately from the eyes.
Ingestion Toxicity:	Ingestion may cause irritation of the gastrointestinal tract and gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting or diarrhea. Ingestion of large amounts may produce ulceration to the GI tract. Slightly toxic if swallowed.
Acute Target Organ Toxicity:	Contact with the eyes and mucous membranes causes transient irritation. Minor corneal involvement may occur if product is not rinsed immediately from the eyes. Inhalation may cause irritation. Contact with skin causes irritation.

Prolonged (Chronic) Health Effects

Carcinogenicity:	This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.
Reproductive and Developmental Toxicity:	This chemical has been tested in laboratory animals and no evidence of teratogenicity was seen.
Inhalation:	There are no known or reported effects from chronic exposure except for effects similar to those experienced from acute exposure.
Skin Contact:	Repeated or prolonged skin exposure may cause dermatitis and possible "soda ulcers" (blistering) of the hands and wrists. This can result in secondary infections.
Ingestion:	There are no known or reported effects from chronic ingestion except for effects similar to those experienced from single exposure.
Eye Contact:	Minor corneal involvement may occur with possible impairment of vision if product is not rinsed immediately from the eyes.
Sensitization:	This material is not known or reported to be a skin or respiratory sensitizer.
Chronic Target Organ Toxicity:	There are no known or reported effects to humans from repeated exposure to this product.
Supplemental Health Hazard Information :	No additional health information available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

CAS OR CHEMICAL NAME	CAS #	% RANGE
Sodium carbonate	497-19-8	99.8 - 100.00

4. FIRST AID MEASURES

Inhalation:	IF INHALED: Remove individual to fresh air. Seek medical attention if breathing becomes difficult or if respiratory irritation develops. If not breathing, give artificial respiration. Call for medical assistance.
Skin Contact:	IF ON SKIN: Immediately flush skin with plenty of water for 15 minutes. If clothing comes in contact with the product, the clothing should be removed immediately and laundered before re-use. Seek medical attention.
Eye Contact:	IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention immediately.
Ingestion:	IF SWALLOWED: Call a physician immediately. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flammability Summary (OSHA):	Product is not known to be flammable, combustible, pyrophoric or explosive.
Flammable Properties	
Flash Point:	Not applicable
Autoignition Temperature:	Not applicable
Fire / Explosion Hazards:	Material will not ignite or burn.
Extinguishing Media:	Choose extinguishing media suitable for surrounding materials.
Fire Fighting Instructions:	In case of fire, use normal fire-fighting equipment and the personal protective equipment recommended in Section 8 to include a NIOSH approved self-contained breathing apparatus.
Hazardous Combustion Products:	Carbon monoxide, Carbon dioxide, Sodium oxide
Upper Flammable / Explosive Limit, % in air:	Not applicable
Lower Flammable / Explosive Limit, % in air:	Not applicable

6. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations:	Use the personal protective equipment recommended in Section 8 and a NIOSH approved self-contained breathing apparatus.
Spill Mitigation Procedures	
Air Release:	Dusting from this product could occur. Contain all solids for treatment or disposal.
Water Release:	This material is soluble in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so. Contain all solids for treatment or disposal.
Land Release:	Sweep up and place in suitable clean, dry containers for reclamation or later disposal. Do not place spill materials back in their original containers. After removal, flush contaminated area thoroughly with water. Contain all solids for treatment or disposal.
Additional Spill Information :	Stop source of spill as soon as possible and notify appropriate personnel. Utilize emergency response personal protection equipment prior to the start of any response. Evacuate all non-essential personnel. Dispose of spill residues per guidelines under Section 13, Disposal Consideration.



7. HANDLING AND STORAGE

Handling:	Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing dust from this material.
Storage:	Store in a cool, dry place. Isolate from incompatible materials.
Incompatible Materials for Storage:	Refer to Section 10, "Incompatible Materials."

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation:	Local exhaust ventilation is recommended if significant dusting occurs. Otherwise use general exhaust ventilation.

Protective Equipment for Routine Use of Product

Respiratory Protection :	Respiratory protection not normally needed. If dusting occurs, wear a NIOSH approved respirator.
Respirator Type :	Wear a NIOSH approved N95 respirator.
Skin Protection :	Wear impervious gloves to avoid skin contact. A safety shower should be provided in the immediate work area.
Eye Protection:	Use chemical goggles. Emergency eyewash should be provided in the immediate work area.
Protective Clothing Type:	Natural rubber, Neoprene, Nitrile

Exposure Limit Data

CHEMICAL NAME	CAS #	Name of Limit	Exposure
No Data Found			

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	solid
Form	granular
Color:	white
Odor:	None
Molecular Weight:	105.99
Specific Gravity :	2.5090
pH :	11.4 1% solution
Boiling Point:	Decomposes
Freezing Point:	No data
Melting Point:	No data
Density:	1.0400
Vapor Pressure:	Not applicable
Vapor Density:	Not applicable
Viscosity:	Not applicable
Fat Solubility:	No data
Solubility in Water:	33.2% max.
Partition coefficient n-octanol/water:	Not applicable
Evaporation Rate:	Not applicable
Oxidizing:	No data

Volatiles, % by vol.:	Not applicable
VOC Content	No data
HAP Content	No data

10. STABILITY AND REACTIVITY

Stability and Reactivity Summary:	Stable under normal conditions. Not sensitive to mechanical shock. Not sensitive to static discharge. Product will not undergo hazardous polymerization.
Conditions to Avoid:	High temperatures, Contact with incompatible substances
Chemical Incompatibility:	Aluminum powder, acids, Fluorine, Molten lithium
Hazardous Decomposition Products:	Carbon monoxide, Carbon dioxide, Sodium oxide
Decomposition Temperature:	851°C

11. TOXICOLOGICAL INFORMATION

Component Animal Toxicology

Oral LD50 value:
Sodium carbonate LD50 = 4,090 mg/kg Rat

Dermal LD50 value:
Sodium carbonate LD50 Believed to be > 2,000 mg/kg Rabbit

Inhalation LC50 value:
Sodium carbonate Inhalation LC50 1 HOUR = 4.6 MG/L Rat

Product Animal Toxicity

Oral LD50 value:	LD50 = 4,090 mg/kg Rat
Dermal LD50 value:	LD50 Believed to be > 2,000 mg/kg Rabbit
Inhalation LC50 value:	Inhalation LC50 1 HOUR = 4.6 MG/L Rat
Skin Irritation:	This material is expected to be mildly to moderately irritating.
Eye Irritation:	This material is expected to be moderately to severely irritating.
Skin Sensitization:	This material is not known or reported to be a skin or respiratory sensitizer.
Acute Toxicity:	Contact with the eyes and mucous membranes causes transient irritation. Minor corneal involvement may occur if product is not rinsed immediately from the eyes. Inhalation may cause irritation. Contact with skin causes irritation.
Subchronic / Chronic Toxicity:	Damage to lungs has been observed in laboratory animals from repeated inhalation of high concentrations (70 mg/m3). This damage is characterized by thickening of the walls of the air sacs and a low grade of pulmonary inflammation. The risk to human health is low due to the high concentration required to produce the effect., Repeated or prolonged skin contact with this product may cause dermatitis and blistering.

Sodium carbonate	Male rats were exposed to an aerosol of 2% aqueous solution of sodium carbonate, 4 hr.day, 5 days/week for 3-1/2 months. No effect was observed at a concentration of 10 or 20 mg/cubic meter. At 70 mg/cubic meter weight gain was decreased and the lungs showed thickening of the intra-alveolar walls, hyperemia, and lymphoid infiltration., Repeated or prolonged skin contact with this product may cause

dermatitis and blistering.

Reproductive and Developmental Toxicity: This chemical has been tested in laboratory animals and no evidence of teratogenicity was seen.

Sodium carbonate: This chemical has been tested in laboratory animals and no evidence of teratogenicity was seen.

Mutagenicity: This product was determined to be non-mutagenic in the Ames assay. It was also shown to be non-clastogenic in the chromosomal aberration test.

Sodium carbonate: This product was determined to be non-mutagenic in the Ames assay. It was also shown to be non-clastogenic in the chromosomal aberration test.

Carcinogenicity: This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

12. ECOLOGICAL INFORMATION

Overview: Practically non- toxic to fish and other aquatic organisms.

Ecological Toxicity Values for: **Sodium carbonate**

Fathead minnow (Pimephales promelas),	-	(nominal, static). 96 HOUR LC50 < 850 mgl
Bluegill	-	(nominal, static). 96 HOUR LC50 = 320 mgl
Mosquito fish	-	(nominal, static). 96 HOUR LC50 = 740 mgl
Daphnia magna,	-	(nominal, static). 48 HOUR LC50= 265 mgl
Ceriodaphnia dubia	-	(nominal) 48 HOUR EC50= 199.82 mgl
Navicula seminulum (diatom)	-	(nominal, static). 96 HOUR EC50 = 242 mgl

13. DISPOSAL CONSIDERATIONS

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THE MATERIAL. THE USER OF THE MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

Waste Disposal Summary : If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D.

Disposal Methods : As a nonhazardous waste, it should be disposed of in accordance with local, state and federal regulations.

Potential US EPA Waste Codes : Not applicable

14. TRANSPORT INFORMATION

Land (US DOT): NOT REGULATED AS A DOT HAZARDOUS MATERIAL
Water (IMDG): NOT REGULATED AS A HAZARDOUS MATERIAL,

Flash Point: Not applicable
Air (IATA): NOT REGULATED AS A HAZARDOUS MATERIAL,
Emergency Response Guide Number: Not applicable

Transportation Notes: 1) Inhalation toxicity data indicates product to be toxic by inhalation, however, diameter of over 90% of granules well exceed 10 micron limit. Particles cannot be inhaled through lungs. Inhalation is not a normal route of absorption relative to transportation.

15. REGULATORY INFORMATION

UNITED STATES:
Toxic Substances Control Act (TSCA): The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.
EPA Pesticide Registration Number: None established

FIFRA Listing of Pesticide Chemicals (40 CFR 180): Not registered in the US under FIFRA.

Superfund Amendments and Reauthorization Act (SARA) Title III:

Hazard Categories Sections 311 / 312 (40 CFR 370.2):
Health: Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
Physical: None

Emergency Planning & Community Right to Know (40 CFR 355, App. A):

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:
SARA III Threshold Planning Quantity: None established

Reportable Quantity (49 CFR 172.101, Appendix):
CERCLA None established
SARA III Reportable quantity: None established

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components

SARA III De minimis concentration: None established

Clean Air Act Toxic ARP Section 112r:
CAA 112R None established

Clean Air Act Socmi:
HON SOC None established

Clean Air Act VOC Section 111:
CAA 111 None established

Clean Air Act Haz. Air Pollutants Section 112:

CAA	None established
CAA 112I	None established
CAA AP	None established

State Right-to-Know Regulations Status of Ingredients

Pennsylvania:

CAS #	COMPONENT NAME
PENN RTK	None established

New Jersey:

CAS #	COMPONENT NAME
NJ RTK	None established

Massachusetts:

CAS #	COMPONENT NAME
MASS RTK	None established

California Proposition 65:

CAS #	COMPONENT NAME
US CA CRT	None established
US CA65CRT	None established

WHMIS Hazard Classification:

WHMIS

Canada. Canadian Environmental Protection Act (CEPA). WHMIS Ingredient Disclosure List (Can. Gaz., Part II, Vol. 122, No. 2)

WHMIS
01 1988
Threshold limits: 1%
English List no. 1426
SODIUM BISULFATE

Canada. Canadian Environmental Protection Act (CEPA). WHMIS Ingredient Disclosure List (Can. Gaz., Part II, Vol. 122, No. 2)

WHMIS
01 1988
Threshold limits: 1%
English List no. 1431
SODIUM CARBONATE



16. OTHER INFORMATION

MSDS REVISION STATUS : Revised to meet the ANSI standard of 16 sections
Major References : Available upon request.

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Arch Chemicals, Inc.

MATERIAL SAFETY DATA SHEET

FOR ANY EMERGENCY, 24 HOURS / 7 DAYS, CALL:	1-800-654-6911
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL:	1-800-511-MSDS

PRODUCT NAME: BAQUACIL CALCIUM HARDNESS INCREASER

1. PRODUCT AND COMPANY IDENTIFICATION

Arch Chemicals, Inc.
501 Merritt 7 PO Box 5204
Norwalk, CT 06856-5204

REVISION DATE:	02/09/2006
SUPERCEDES:	02/09/2006
MSDS Number:	000000002432
SYNONYMS:	Calcium Plus, Calcium Adjuster, Hardness Adjuster, Calcium Chloride
CHEMICAL FAMILY:	Alkaline salts
DESCRIPTION / USE:	Hardness increaser for swimming pools
FORMULA:	CaCl2

2. HAZARDS IDENTIFICATION

OSHA Hazard Classification:	**Eye irritant, Mild skin irritant, Mild respiratory irritant**

Routes of Entry:	Inhalation, skin, eyes, ingestion
Chemical Interactions:	No known or reported interactions.
Medical Conditions Aggravated:	None known or reported

Human Threshold Response Data

Odor Threshold	Not established.
Irritation Threshold	Not established.

Hazardous Materials Identification System / National Fire Protection Association Classifications

Hazard Ratings :	Health	Flammability	Physical / Instability	PPI / Special hazard.
HMIS	2	0	1	
NFPA	Not established			

Immediate (Acute) Health Effects

Inhalation Toxicity:	Dust may be irritating to respiratory tract. If inhaled, mild irritation may result to the throat, upper respiratory tract, and lungs. Any irritation would be transient with no permanent damage expected.
Skin Toxicity:	Not expected to be toxic from dermal contact. Skin contact may cause minor irritation consisting of transient redness and/or swelling. This irritant effect would not be expected to result in permanent damage.

Eye Toxicity:	Contact with the eyes would be expected to cause moderate to severe irritation consisting of redness, swelling, and mucous discharge to the conjunctiva. Corneal injury with impairment of vision may occur. If not immediately rinsed from the eyes, thermal burns may occur because of the heat given off as it dissolves.
Ingestion Toxicity:	Moderately toxic if swallowed. Ingestion may cause irritation of the gastrointestinal tract and gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting or diarrhea. Ulceration may also occur resulting in G.I. bleeding.
Acute Target Organ Toxicity:	Powder can cause irritation to eyes, skin & respiratory tract. Liquid solution can cause burns to the skin and eyes.

Prolonged (Chronic) Health Effects

Carcinogenicity:	This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.
Reproductive and Developmental Toxicity:	Not known or reported to cause reproductive or developmental toxicity.
Inhalation:	Prolonged or repeated exposure may cause more severe irritation.
Skin Contact:	Prolonged contact may cause burns especially if skin is damp and/or abraded. When dissolving, the heat produced may cause more intense effects as well as thermal burns.
Ingestion:	More pronounced gastroenteritis effects and damage to the stomach would probably occur if this material is repeatedly ingested.
Eye Contact:	Prolonged contact may result in permanent damage. Corneal involvement or visual impairment is expected.
Sensitization:	This material is not known or reported to be a skin or respiratory sensitizer.
Chronic Target Organ Toxicity:	There are no known or reported target organ effects from chronic exposure.
Supplemental Health Hazard Information :	No additional health information available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

CAS OR CHEMICAL NAME	CAS #	% RANGE
CALCIUM CHLORIDE	10043-52-4	90 - 95
Water	7732-18-5	2 - 4
SODIUM CHLORIDE	7647-14-5	1 - 2
POTASSIUM CHLORIDE (KCL)	7447-40-7	1 - 2

4. FIRST AID MEASURES

Inhalation:	IF INHALED: Remove individual to fresh air. Seek medical attention if breathing becomes difficult or if respiratory irritation develops. If not breathing, give artificial respiration. Call for medical assistance.
Skin Contact:	IF ON SKIN: Immediately flush skin with plenty of water for 15 minutes. If clothing comes in contact with the product, the clothing should be removed immediately and laundered before re-use. Seek medical attention.
Eye Contact:	IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention immediately.
Ingestion:	IF SWALLOWED: Call a physician immediately. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flammability Summary (OSHA):	Product is not known to be flammable, combustible, pyrophoric or explosive.
Flammable Properties	
Flash Point:	Not applicable
Autoignition Temperature:	Not applicable
Fire / Explosion Hazards:	If the product is involved in a fire, toxic smokes could develop.
Extinguishing Media:	Choose extinguishing media suitable for surrounding materials.
Fire Fighting Instructions:	In case of fire, use normal fire-fighting equipment and the personal protective equipment recommended in Section 8 to include a NIOSH approved self-contained breathing apparatus. Use water to cool containers.
Hazardous Combustion Products:	Carbon monoxide, Carbon dioxide
Upper Flammable / Explosive Limit, % in air:	Not applicable
Lower Flammable / Explosive Limit, % in air:	Not applicable

6. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations:	Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to boots, impervious gloves, hard hat, splash-proof goggles, impervious clothing, i.e., chemically impermeable suit, self-contained breathing apparatus.
Spill Mitigation Procedures	
Air Release:	Vapors may be suppressed by the use of water fog.
Water Release:	This material is soluble in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so.

Land Release:	Sweep up and place in suitable clean, dry containers for reclamation or later disposal.
Additional Spill Information :	Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel. Utilize emergency response personal protection equipment prior to the start of any response. Evacuate all non-essential personnel. Dispose of spill residues per guidelines under Section 13, Disposal Consideration.

7. HANDLING AND STORAGE

Handling:	Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing dust from this material.
Storage:	Store in a cool, dry and well ventilated place. Material is hygroscopic. Protect from moisture-laden air.
Incompatible Materials for Storage:	Refer to Section 10, "Incompatible Materials."

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation:	Local exhaust ventilation is recommended if significant dusting occurs. Otherwise use general exhaust ventilation.

Protective Equipment for Routine Use of Product

Respiratory Protection :	Respiratory protection not normally needed. Wear a NIOSH approved respirator if dusts are created.
Respirator Type :	Wear a NIOSH approved N95 respirator.
Skin Protection :	Wear impervious gloves to avoid skin contact. A safety shower should be provided in the immediate work area.
Eye Protection:	Use chemical goggles. Emergency eyewash should be provided in the immediate work area.
Protective Clothing Type:	Impervious

Exposure Limit Data

CHEMICAL NAME	CAS #	Name of Limit	Exposure
No Data Found			

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	solid,
Form	Flakes
Color:	White
Odor:	None
Molecular Weight:	111.00
Specific Gravity :	2.1500
pH :	7.0 - 9.0 @ 5% aqueous solution
Boiling Point:	Not applicable
Freezing Point:	Not applicable
Melting Point:	Not applicable

Density:	42.0000 - 51.0000lb/ft3
Vapor Pressure:	No data
Vapor Density:	Not applicable
Viscosity:	No data
Fat Solubility:	No data
Solubility in Water:	soluble
Partition coefficient n-octanol/water:	Not applicable
Evaporation Rate:	Not applicable
Oxidizing:	No data
Volatiles, % by vol.:	No data
VOC Content	Not applicable
HAP Content	Not applicable

10. STABILITY AND REACTIVITY

Stability and Reactivity Summary:	Stable under normal conditions. Product will not undergo hazardous polymerization.
Conditions to Avoid:	Sparks, open flame, other ignition sources, and elevated temperatures., Exposure to moist air or water
Chemical Incompatibility:	metals, water
Hazardous Decomposition Products:	Chlorine
Decomposition Temperature:	Not applicable

11. TOXICOLOGICAL INFORMATION

Component Animal Toxicology

Oral LD50 value:

CALCIUM CHLORIDE	LD50	=	1,000 mg/kg	Rat
SODIUM CHLORIDE	LD50	=	3,000 mg/kg	Rat
POTASSIUM CHLORIDE (KCL)	LD50	=	2,600 mg/kg	Rat
Magnesium Chloride	LD50	=	2,800 mg/kg	Rat

Dermal LD50 value:

CALCIUM CHLORIDE	LD50	=	2,630 mg/kg	Rat
SODIUM CHLORIDE	LD50	>	10,000 mg/kg	Rabbit
POTASSIUM CHLORIDE (KCL)	No data			
Magnesium Chloride	No data			

Inhalation LC50 value:

CALCIUM CHLORIDE	No data
SODIUM CHLORIDE	Inhalation LC50 1 HOUR > 42 MG/L Rat
POTASSIUM CHLORIDE (KCL)	No data
Magnesium Chloride	No data

Product Animal Toxicity

Oral LD50 value:	LD50 Believed to be, Approximately 1,000 mg/kg Rat
Dermal LD50 value:	LD50 Believed to be > 2,000 mg/kg Rat
Inhalation LC50	No data

value:

Skin Irritation:	This material is expected to be slightly irritating.
Eye Irritation:	Moderate to Severe Eye Irritant
Skin Sensitization:	This material is not known or reported to be a skin or respiratory sensitizer.
Acute Toxicity:	Powder can cause irritation to eyes, skin & respiratory tract. Liquid solution can cause burns to the skin and eyes.
Subchronic / Chronic Toxicity:	Not known or reported to cause subchronic or chronic toxicity.

Reproductive and Developmental Toxicity: Not known or reported to cause reproductive or developmental toxicity.

CALCIUM CHLORIDE	Not known or reported to cause reproductive or developmental toxicity.

Mutagenicity: Not known or reported to be mutagenic.

CALCIUM CHLORIDE	This product was determined to be non-mutagenic in the Ames assay. It was also shown to be non-clastogenic in the chromosomal aberration test.

Carcinogenicity: This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

CALCIUM CHLORIDE	This chemical is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.

12. ECOLOGICAL INFORMATION

Overview: No data for product. Individual constituents are as follows:

Ecological Toxicity Values for: **CALCIUM CHLORIDE**

Bluegill	-	(nominal, static). 96 HOUR LC50 = 10,650 mgl
Mosquito fish	-	(nominal, static). 96 HOUR LC50 = 13,400 mgl
Fathead minnow (Pimephales promelas),	-	(nominal, static). 96 HOUR LC50 = 4,630 mgl
Daphnia magna,	-	(nominal, static). 48 HOUR LC50= 2,770 mgl
Ceriodaphnia dubia	-	(nominal, static). 48 HOUR LC50= 1,830 mgl
Nitzschia linearis (diatom)	-	(nominal, static). 5 day LC50 = 3,130 mgl

13. DISPOSAL CONSIDERATIONS

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THE MATERIAL. THE USER OF THE MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

Waste Disposal Summary : If this product becomes a waste, it will be a nonhazardous waste

according to U.S. RCRA regulations. Dispose of in accordance with all Local, State, Federal, and Provincial Environmental Regulations.

Disposal Methods : As a nonhazardous waste, it should be disposed of in accordance with local, state and federal regulations.

Potential US EPA Waste Codes : Not applicable

14. TRANSPORT INFORMATION

Land (US DOT): NOT REGULATED AS A DOT HAZARDOUS MATERIAL
Water (IMDG): NOT REGULATED AS A HAZARDOUS MATERIAL,

Flash Point: Not applicable
Air (IATA): NOT REGULATED AS A HAZARDOUS MATERIAL,
Emergency Response Guide Number: Not applicable

15. REGULATORY INFORMATION

UNITED STATES:

Toxic Substances Control Act (TSCA): The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.
EPA Pesticide Registration Number: None established

FIFRA Listing of Pesticide Chemicals (40 CFR 180): Not registered in the US under FIFRA.

Superfund Amendments and Reauthorization Act (SARA) Title III:

Hazard Categories Sections 311 / 312 (40 CFR 370.2):
Health Immediate (Acute) Health Hazard
Physical None

Emergency Planning & Community Right to Know (40 CFR 355, App. A):

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:
SARA III Threshold Planning Quantity: None established

Reportable Quantity (49 CFR 172.101, Appendix):
CERCLA None established
SARA III Reportable quantity: None established

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components

SARA III De minimis concentration: None established

Clean Air Act Toxic ARP Section 112r:
CAA 112R None established

Clean Air Act Socmi:
HON SOC None established

Clean Air Act VOC Section 111:

CAA 111 None established

Clean Air Act Haz. Air Pollutants Section 112:

CAA None established

CAA 112I None established

CAA AP None established

State Right-to-Know Regulations Status of Ingredients

Pennsylvania:

CAS #	COMPONENT NAME
PENN RTK	None established

New Jersey:

CAS #	COMPONENT NAME
NJ RTK	None established

Massachusetts:

CAS #	COMPONENT NAME
MASS RTK	None established

California Proposition 65:

CAS #	COMPONENT NAME
US CA CRT	None established
US CA65CRT	None established

WHMIS Hazard Classification:

WHMIS None established

16. OTHER INFORMATION

MSDS REVISION STATUS : Revised to meet the ANSI standard of 16 sections

Major References : Available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT. .

NOTE-TAKING GUIDE

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NOTE-TAKING GUIDE

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HAZARDOUS MATERIALS INCIDENT MANAGEMENT



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Slide 4-2

UNIT 4: OPERATIONAL CONSIDERATIONS

Slide 4-2

Slide 4-3

WHY OPERATIONS LEVEL?

- **Incident Commander (IC) must complete operations level competencies plus Incident Command competencies.**
- **29 Code of Federal Regulations (CFR) 1910.120(q)(iii)(v).**
- **This unit refreshes and instills confidence in potential ICs to help reduce liability.**

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Slide 4-4

TERMINAL OBJECTIVE

The students will be able to identify unique operational considerations associated with hazardous materials/weapons of mass destruction (hazmat/WMD) incidents.



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ENABLING OBJECTIVES

The students will:

- **Identify at least three site control measures at a hazmat/WMD incident.**
- **List three types of decontamination methods that can be implemented at a hazmat/WMD incident.**



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ENABLING OBJECTIVES (cont'd)

- **Choose appropriate site control measures, personal protective equipment (PPE), and decontamination operations when given a simulated hazmat/WMD incident.**



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Slide 4-7

SITE CONTROL: ISOLATION

Operational activities designed to gain and maintain physical control of a hazmat/ WMD incident scene.



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ESTABLISHMENT OF PERIMETERS

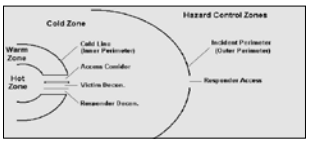
Perimeter ( )

- **Located at the outside border of the incident (Cold Zone).**
- **In terrorism, illicit labs, mass casualty/ fatality incident, plane crash, etc., may require security protection.**
- **Routine responsibility of law enforcement.**
- **Requires multiagency coordination.**

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ESTABLISHMENT OF PERIMETERS (cont'd)



Perimeters (inner perimeter)

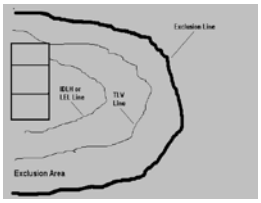
- **Separation of Cold Zone and Warm Zone**
- **The equivalent of the Cold Line**
- **Provides access control into the hazard area (Hot Zone)**

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ZONING

Hot Zone subzones
- **Area of safe refuge**
- **Immediate release area**
- **Different lines usually used in cleanup operations**



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ZONING (cont'd)

Three-dimensional zoning
- **Horizontal**
  - **– Outside structure**
  - **– Inside structure**
- **Vertical**
  - **– Above and below**



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DENIAL OF ENTRY AND EGRESS

Actions to prevent movement into, out of, or within operational zones or perimeters without following appropriate procedures
- **May require armed personnel (law enforcement)**
- **Stringent personnel identification and screening procedures**

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DENIAL OF ENTRY AND EGRESS (cont'd)

Site Access Control Leader

- **Responsible for controlling the movement of people and equipment through appropriate routes**
- **Contamination control**
- **May require joint fire and law enforcement personnel**

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INITIAL PUBLIC ACTIONS

Evacuation

- **Long-duration release**
- **Mass fire or explosion potential**
- **Inability to shelter-in-place**

In-place protection

- **Area already highly contaminated**
- **No mass fire or explosion potential**
- **Occupancies or areas that cannot be evacuated**
- **Evacuation would expose the public**

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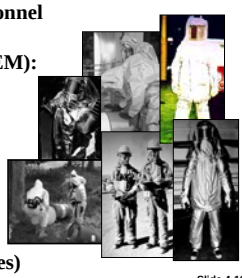
Activity 4.1
Isolation: Site Control Considerations

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PERSONAL PROTECTIVE EQUIPMENT

- **PPE worn to protect personnel from specific hazards**
- **Primary hazards (TRACEM):**
  - **Thermal**
  - **Radiation**
  - **Asphyxiation**
  - **Chemical**
  - **Etiologic**
  - **Mechanical**
  - **Additional hazard — electrical (at fixed facilities)**



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PERSONAL PROTECTIVE EQUIPMENT (cont'd)

Must be designed to protect against the specific hazard or hazards to be encountered

- **Primary hazard**
  - **Most severe hazard of the substance**
  - **May be more than one**
- **Secondary hazard**
  - **Not as severe as the primary**
  - **Also must be addressed**

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PRIMARY AND SECONDARY HAZARDS

- **Gasoline**
  - **Primary — flammability**
  - **Secondary — toxicity**
- **Ammonia**
  - **Primary — toxicity**
  - **Secondary — flammability**
- **Chlorine**
  - **Primary — toxicity**
  - **Secondary — corrosive**

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TYPES OF PPE BASED ON HAZARDS

- **Thermal PPE**
  - **Not designed for direct flame contact**
  - **Reasonable radiant heat, cold and flash protection**
- **Proximity suits**
  - **Designed similar to structural PPE with an aluminized outer covering**
  - **Primary function is protection from radiant heat**
- **Entry suits**
  - **Designed to protect wearer for 30 to 60 seconds of direct flame contact**

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RADIATION

- **Most common protection is procedural**
  - **Time**
  - **Distance**
  - **Shielding**
- **Chemical or structural PPE can provide shielding protection**
  - **Decontamination is critical**
  - **Department of Transportation (DOT) North American Emergency Response Guidebook (NAERG) generally states "delay decontamination and cleanup until instructions are received from Radiation Authority"**

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ASPHYXIATION

- **Inhalation of material.**
- **Material replaces oxygen from area.**
- **Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120(q)(3)(iv) requires IC to:**
  - **When substance presents an inhalation hazard employees shall wear positive-pressure self-contained breathing apparatus (PP-SCBA) while engaged in emergency response**

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ASPHYXIATION (cont'd)

OSHA 1910.120 (cont'd)

– In order to reduce level of protection the IC must determine, through the use of air monitoring, that a reduced level of respiratory protection will not result in hazardous exposures to employees.

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CHEMICAL

- **Designed to protect against chemical hazards:**
  - **Toxicity**
  - **Tissue destruction**
  - **Corrosivity**
  - **Oxidation**
- **Limitations:**
  - **Not recommended when concentrations of 20 to 25 percent of lower exposure limit (LEL)**
  - **Provides no thermal protection**
  - **Additional flash protection may be added**

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CHEMICAL RESPIRATORY PROTECTION

- **OSHA 29 CFR 1910.120 (q)(3)(iv) requires PP-SCBA**
  - **Self-contained breathing apparatus (SCBA) with air supply bottle**
  - **SCBA with air line supply**
  - **Rebreathing apparatus**
- **Other respiratory options:**
  - **Air-purifying respirator (APR)**
  - **Powered air-purifying respirator (PAPR)**

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CHEMICAL PROTECTIVE GARMENTS

- **Level A — highest level of protection**
  - **Totally encapsulating**
- **Level B — moderate level of protection**
  - **SCBA is worn outside of garment**
- **Level C — low level of protection**
  - **Splash garments**
- **Level D — no special level of protection**
  - **Work uniform**

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ETIOLOGICAL HAZARDS

- **Typically require Level C or Level B protection**
- **May require universal precautions for Emergency Medical Services (EMS)**
- **Decontamination procedures should be in place before incident**
  - **Red bags**
  - **Isolation areas**

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MECHANICAL HAZARDS

- **Protection from exploding devices, shrapnel and falling debris.**
- **Firefighter helmet is designed to resist impact from objects.**
- **Structural PPE will provide some resistance.**
- **Chemical garments (Level A or Level B) provide no special protection.**

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PPE BASED ON THE HAZARD

Chemical
- **Full structural turnouts with SCBA**
- **When taped with duct tape, similar protection to Military Oriented Protection Posture (MOPP) 4**
- **Higher respiratory protection**
- **For rescue, flammability operations**
- **Stay out of visible vapor, mist, dust and liquid**
- **Appropriate in some hazmat situations**



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3/30 RULE

- **Structural PPE was tested for resistance from permeation of WMD chemical agents such as sarin.**
- **Test indicated that structural PPE with connections of gloves/sleeves and coat/pants would provide protection from WMD chemical agents.**
  - **Three minutes of protection — upon entry no one is alive in area.**
  - **Thirty minutes of protection — upon entry people are alive.**
  - **The National Fire Academy (NFA) does not necessarily endorse the use of structural PPE for use at incidents involving WMD chemical agents. This is provided for your information only.**

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VIDEO:

"3/30 Rule"



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PPE PROGRAM

- **Required by 29 CFR 1910.120(i)(5)**
- **Must include:**
  - **Selection and use criteria**
  - **Maintenance and storage**
  - **Training**
  - **Inspections**
  - **Procedures**
  - **Evaluation of the program**
  - **Temperature limitations**

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Activity 4.2
Personal Protective Equipment

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DECONTAMINATION



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DEFINITION OF CONTAMINATION

The process of transferring a hazardous material, or the hazardous component of a WMD, from its source to people, animals, the environment or equipment, which may act as a carrier.

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DEFINITION OF DECONTAMINATION

The physical or chemical process of reducing and preventing the spread of contaminants from persons and equipment involved at a hazmat/WMD incident.

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TYPES OF DECONTAMINATION

- **Emergency**
- **Mass**
- **Gross**
- **Technical**
- **Secondary**



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METHODS OF PERFORMING DECONTAMINATION

- **Emulsification**
- **Chemical reaction**
- **Disinfection**
- **Dilution**
- **Absorption**
- **Adsorption**
- **Removal (dry vacuum or water spray)**
- **Disposal**

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DECONTAMINATION — FIRST RESPONDERS

- **Gross decontamination**
  - **– Occurs in decontamination corridor**
  - **– Removes enough contamination to get personnel out of their PPE safely**
  - **– Residual contamination on skin, in hair, etc. is expected**
- **Secondary decontamination**
  - **– Generally occurs after incident is completed at fixed facility with shower capabilities**

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DECONTAMINATION — CONTAMINATED VICTIMS

- **Additional decontamination corridor for nonemergency response personnel.**
- **Nonambulatory victims will require special handling procedures.**
- **Consider what will be done with their personal possessions.**
- **Consider what they will be dressed in after decontamination.**

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MASS VICTIM DECONTAMINATION

Used when large numbers need to be decontaminated in a short time:

- **Initial hand fog line.**
- **Place apparatus side-by-side with fog nozzle on discharge gate facing each other — low pressure to create decontamination corridor.**
- **Privacy may be provided by using a ladder over corridor to support tarps.**

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WET VERSUS DRY DECONTAMINATION

- **Water-reactive materials require dry decontamination.**
- **Special high-efficiency particulate arresting (HEPA) vacuum cleaners may be used by hazmat teams.**
- **Adhesive rollers can remove surface particulate.**
- **May be appropriate for incidents such as white powder releases in office settings during cold weather operations.**

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RESOURCES

- **Hazmat teams**
- **Shoring teams and equipment**
- **Federal, state and local resources**
- **Contractors for specialized equipment**
- **Cleanup contractors**
- **Military**
  – **Department of Defense (DOD), Civil Support Teams (CSTs)**

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COORDINATION OF RESOURCES

Emergency management assistance (EMA):

- **Prepares contracts and agreements**
- **Identifies special resource organizations**
- **Maintains contact lists**
- **Tracks resources and costs**
- **Creates resource inventories**

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FUNDING

- **Federal**
  - **Hazardous Materials Transportation Act (HMTA)**
  - **Superfund Amendments and Reauthorization Act (SARA)**
  - **Grants**
- **State**
- **County/Local**

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CFR 40 REIMBURSEMENT

- **Compliance with SARA**
- **Hazmat incident only**
  - **Up to $25,000 per incident**
  - **Must charge shipper/owner first**
  - **Accurate records required**
- **Only one jurisdiction may apply**

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STRESS AND HAZMAT RESPONSE

- **Two primary types of stress:**
  - **Physiological.**
  - **Psychological.**
- **Both can produce negative results and hinder operations.**

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STRESS AND HAZMAT RESPONSE (cont'd)

Physiological stress — exertion-related

- **Potential for long, drawn-out operations**
- **Movement of heavy equipment and materials**
- **Potential for high levels of physical exertion**

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STRESS AND HAZMAT RESPONSE (cont'd)

Physiological stress — PPE-related:

- **Heat stress (hyperthermia) is a routine hazard caused by inability of perspiration to evaporate.**
- **Cold stress (hypothermia) is a potential in cold climates or when operating in cold environments (cold storage).**

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STRESS AND HAZMAT RESPONSE (cont'd)

Combating physiological stress:
- **Maintain good physical fitness**
- **Pre-entry hydration**
- **Post-entry rehabilitation**
- **Use of appropriate in-suit operational periods**
- **Modification of in-suit operational periods based on weather and work conditions**

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STRESS AND HAZMAT RESPONSE (cont'd)

Psychological stress — apprehension:
- **Chemophobic nature of society and response personnel**
- **Lack of understanding of substances**
- **Perceived unpredictability of chemical behavior**
- **Fear of chemical exposure and illness**

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STRESS AND HAZMAT RESPONSE (cont'd)

Psychological stress — lack of familiarity:
- **Not the most common type of incident**
- **Potentially large, complex and taxing incidents**
- **Pressure to return to normal**
- **May involve multiple casualty/fatality incidents**
- **Large number of agencies involved**

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STRESS AND HAZMAT RESPONSE (cont'd)

Combating psychological stress:

- **Training and understanding of roles, functions and expectations**
- **Training and understanding of operational procedures and plans**
- **Ability to implement Unified Command, existing plan, and response system**
- **Critical incident stress debriefing (CISD) as required**

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Activity 4.3
Delivery Truck Incident

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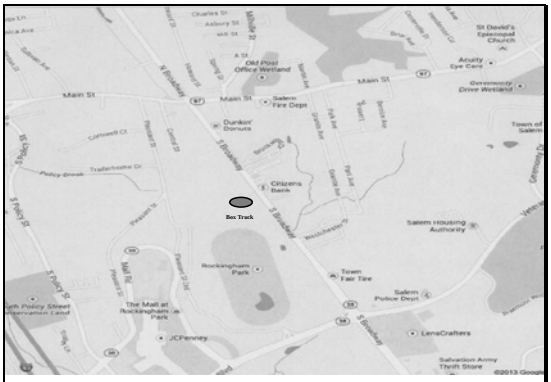
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SUMMARY

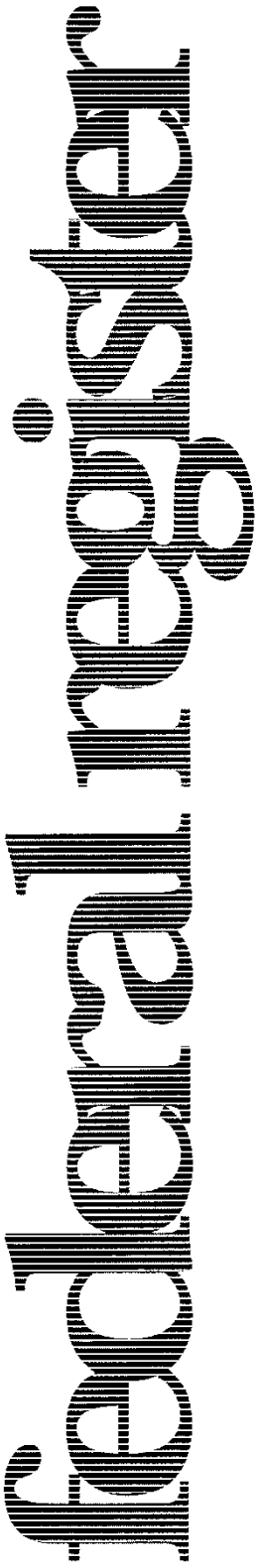
- **Site control**
- **PPE**
- **Decontamination**
- **Resources**
- **Stress**

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APPENDIX

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Wednesday
February 18, 1998

Part III

Environmental Protection Agency

40 CFR Part 310

Reimbursement to Local Governments for Emergency Responses to Hazardous Substances Releases; Final Rule

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 310

[FR–5958–1]

RIN 2050–AE36

Reimbursement to Local Governments for Emergency Responses to Hazardous Substance Releases

AGENCY: Environmental Protection Agency (EPA).

ACTION: Interim final rule.

SUMMARY: In response to President Clinton's regulatory reform initiative to reduce the burden on small entities, and eliminate, streamline, and rewrite regulations in plain English, the Environmental Protection Agency ("we" or EPA) is issuing this interim final rule (regulation). Through this regulation, EPA will streamline procedures used to reimburse local governments for emergency response costs. Local governments may be reimbursed for certain costs they incur in taking temporary emergency measures related to releases of hazardous substances, pollutants and contaminants. Through this regulation, we are: Easing program and reporting requirements to make reimbursement more accessible; Simplifying the application process; Streamlining EPA's evaluation process to speed up reviewing applications and paying eligible applicants; and, Reorganizing the entire part 310 to make it clearer and easier to use.

Reimbursement through this program will help lighten financial burdens placed on local governments that respond to hazardous releases or threats. Reimbursement will also help strengthen effective emergency response at the local level.

DATES: The effective date for this interim final rule is February 18, 1998. The Director of the **Federal Register** has approved the incorporation by reference of certain publications listed in this regulation as of February 18, 1998. Comments must be received on or before April 20, 1998.

ADDRESSES: Mail comments on specific aspects of this rulemaking and the information collection to Local Governments Reimbursement Program, Office of Emergency and Remedial Response (5204–G), Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460. You may review information collection materials from 8:30 a.m. to 5:30 p.m., Monday through Friday, by visiting Public Docket No. LGR–xx, located at 1235 Jefferson Davis Highway (ground floor), Arlington, Virginia. A reasonable fee may be charged for copying docket material.

FOR FURTHER INFORMATION CONTACT: For information on specific aspects of this final rule for reimbursement to local governments, contact: Lisa Boynton, (703) 603–9052, Local Governments Reimbursement Project Officer, Office of Emergency and Remedial Response (5204–G), U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460.

SUPPLEMENTARY INFORMATION: We have included a summary of the changes in today's Register. If you would like to see a detailed description of the changes and the rationale for them, contact Lisa Boynton at the address provided under "For Further Information." If you would like to skip the discussion of the changes and refer directly to the requirements for reimbursement, turn to § 310.1.

I. What Is the Statutory Authority for This Program?

Section 123 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. 9623, authorizes EPA to reimburse local governments for expenses incurred in carrying out temporary emergency measures. These measures must be necessary to prevent or mitigate injury to human health or the environment associated with the release or threatened release of any hazardous substance, or pollutant or contaminant. Additionally, Section 123(d) of CERCLA, 42 U.S.C. 9623(d), directs the EPA Administrator to issue regulations to implement this program.

The authority to receive, evaluate, and make determinations regarding requests for reimbursement and to issue payments to qualified applicants is delegated to the Director of the State and Site Identification Center within the Office of Emergency and Remedial Response. This rulemaking discusses changes designed to streamline the Agency's current procedures for reimbursing local governments and clarifies how the reimbursement program works.

II. What Else Do I Need to Know About CERCLA?

CERCLA provides broad federal authority to respond directly to releases or threatened releases of hazardous substances and pollutants or contaminants that may endanger human health or welfare or the environment. CERCLA responses usually are joint efforts by federal, state and local agencies. As local public safety and health organizations are normally the first government representatives at the scene of a hazardous substance release, they play a critical role in providing temporary emergency measures.

III. Did Congress Specify What Was to be Reimbursed Under This Program?

Reimbursement under this program can provide some financial relief (limited to $25,000 per single response) to local governments most seriously affected by costs above and beyond those incurred routinely and traditionally. Congress made it clear in the Conference Report for the Superfund Amendments and Reauthorization Act of 1986 that "reimbursement under this provision shall not include reimbursement for normal expenditures that are incurred in the course of providing what are traditionally local services and responsibilities, such as routine emergency firefighting." With the specific requirement in section 123 that reimbursement not supplant local funds normally provided for response, Congress intends that local governments continue to bear some share of expenses for providing temporary emergency measures. However, Congress recognized that in the past, conducting such response activities has placed a significant financial burden on some local governments.

IV. Why Is EPA Amending This Regulation?

EPA believes that the regulations must be amended to: (1) make funds that are available under this program more accessible to local governments; (2) reduce the reporting burden on local governments that apply for reimbursement; and (3) speed up the review and payment of funds to eligible applicants. Therefore, EPA is revising this regulation to ease several program and reporting requirements and to simplify the procedures that local governments follow when applying for reimbursement.

V. Did EPA Get Input From Local Governments in Making Changes to This Regulation?

Yes. Through consultation, training and outreach, EPA obtained input from local government officials who have participated in the reimbursement process. This input has given EPA a greater understanding of the difficulties that local governments encounter when seeking reimbursement which may discourage overall participation in the reimbursement program.

VI. Why Is EPA Issuing an Interim Final Rule for These Changes?

Because this rule falls under the grants, benefits, and contracts exemption of Section 553 of the Administrative Procedures Act (5 U.S.C. 553(a)(2)), the Agency is not required to solicit public comment before this rule becomes effective. In addition, the Agency may make the rule effective immediately upon publication.

The interim final approach is designed to allow EPA to implement these changes and to make the reimbursement money available quickly, while continuing to solicit public comments. Public comments are invited and should be sent to the address listed in the **ADDRESSES** section above. Comments received by April 20, 1998 will be considered in the final rule.

VII. What Is EPA Changing in This Regulation?

Based on the Agency's experience in overseeing the reimbursement program and its ongoing consultation with local governments, EPA is making the following substantive changes to the 1993 Final Rule:

(1) Section 310.5 has been modified to clarify the purpose of the regulations and the possibility that funds may not be available in a particular year;

(2) Section 310.10 has been modified to include several abbreviations;

(3) Section 310.11 has been modified to include definitions of the terms application, Federally-recognized Indian tribes, and potentially responsible parties;

(4) Section 310.25(a) has been added to specify remedies EPA may rely on if incorrect, false or misleading information is submitted with an application for reimbursement;

(5) Section 310.20 has been modified for clarification purposes;

(6) Section 310.30 has been changed to ease the program and reporting requirements for requesting reimbursement;

(7) Section 310.40 has been changed to clarify allowable costs and to streamline the cost documentation requirements;

(8) Section 310.50 has been changed to reduce the reporting requirements and to clarify the application signature authority;

(9) Section 310.60 has been changed to:

(a) streamline and clarify the application evaluation process (including the Agency's approach when there are competing demands on available reimbursement funds);

(b) extend the time periods for applicants to provide additional information to EPA to support their applications; and

(c) give applicants an opportunity to request exceptions to the requirements when there is good cause;

(10) Section 310.70 has been changed to reduce applicant record keeping requirements from ten years to three;

(11) Section 310.80 has been incorporated into Section 310.60 for organizational purposes; and

(12) Section 310.90 has been renumbered and modified to clarify the disputes resolution process.

VIII. What Else Is Different?

EPA reorganized the entire Part 310 to make it clearer and easier to use. The conversion table below will allow you to determine where the various sections of the old regulation are now located:

Existing section	Action	New section(s)
310.5	Revise	310.1, 310.5, 310.6.
310.10	Revise	310.4.
310.11	Revise	310.3.
310.12	Revise	310.24.
310.20	No change	310.5, 310.6.
310.30	Revise	310.11, 310.13, 310.14, 310.17.
310.40	Revise	310.11, 310.12, 310.16.
310.50	Revise	310.7, 310.8, 310.9, 310.10, 310.15, 310.17.
310.60	Revise	310.18, 310.19, 310.20, 310.23, 310.24.
310.70	Revise	310.22.
310.80	Revise	310.23.
310.90	Revise	310.65.

IX. Regulatory Analyses

A. Executive Order No. 12866

Under Executive Order No. 12866, EPA must judge whether a regulation is *"major" and thus would be subject to* the requirement of a Regulatory Impact Analysis. The Agency believes that the notice published today does not meet the definition of a significant regulation because it does not have an annual effect on the economy of $100 million or more; *nor does the rule fall within* the other definitional criteria for a significant regulatory action because the rule eases program and reporting requirements. Therefore, EPA has not prepared a Regulatory Impact Analysis under the Executive Order. OMB did *not review this rule because it is not* significant.

B. Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), generally requires an agency to prepare, and make available for public comment, a regulatory flexibility analysis that describes the impact of a proposed or final rule on small entities (i.e., small *businesses, small organizations,* and small governmental jurisdictions). However, no regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant adverse impact on a substantial number of small entities.

SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities. The following discussion explains EPA's determination.

This regulation involves reimbursement to local governments for the costs of responding to a hazardous substance release. This is a benefit authorized by CERCLA and does not adversely affect the private sector economy or small entities, which may include local governments. In fact, this rule provides a benefit to local governments in the form of reimbursement to offset financial hardship incurred from responses to hazardous substances, pollutants or contaminants. The revisions to this regulation are intended to minimize the burden imposed on local governments in seeking this benefit. EPA, therefore, certifies that this regulation will not have a significant impact on a substantial number of small entities.

C. Paperwork Reduction Act

OMB has approved the original information collection requirements contained in this rule under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*) and assigned control number 2050–0077.

The revised information collection requirements in this rule was submitted for approval to the Office of Management and Budget (OMB) under the *Paperwork Reduction Act,* 44 U.S.C. 3501 *et seq.* An Information Collection Request (ICR) document has been prepared by EPA (ICR No.1425.04) and a copy may be obtained from Sandy Farmer by mail at OPPE Regulatory Information Division; U.S. Environmental Protection Agency (2137); 401 M St., S.W.; Washington, DC 20460, by email at farmer.sandy@epamail.epa.gov, or by calling (202) 260–2740. A copy may also be downloaded off the internet at http://www.epa.gov/icr. The information

requirements are not effective until OMB approves them.

The Agency requires applicants for reimbursement to submit an application package that demonstrates consistency with program eligibility criteria and certifies compliance with the reimbursement requirements. This information collection is necessary to ensure proper use of the Superfund and appropriate distribution of reimbursement awards among applicants. EPA will receive and closely evaluate reimbursement requests in accordance with the promulgated final rule to ensure that the most deserving cases receive awards. We estimate the public reporting burden for this collection of information to average 9 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. We estimate we will receive 36 responses per year for an annual burden estimate of 324 hours per year.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, OPPE Regulatory Information Division; U.S. Environmental Protection Agency (2137); 401 M St., S.W.; Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th St., N.W., Washington, DC 20503, marked "Attention: Desk Officer for EPA." Comments are requested by March 20, 1998. Include the ICR number in any correspondence.

D. Small Business Regulatory Enforcement Fairness Act

Under 5 U.S.C. 801(a)(1)(A) as added by the Small Business Regulatory Enforcement Fairness Act of 1996, EPA submitted a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives and the Comptroller General of the General Accounting Office prior to publication of the rule in today's **Federal Register** . This rule is not a "major rule" as defined by 5 U.S.C. 804(2).

E. Unfunded Mandates Reform Act

"Today's rule is not subject to the requirements of sections 202, 203 and 205 of the UMRA. EPA has determined that this rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. On the contrary, the Agency expects that today's rule will ease program and reporting requirements for local governments so that reimbursement is more accessible.

In addition, the Agency does not believe that today's rule is subject to section 203 of the UMRA to the extent that today's rule simplifies the application process for local governments and does not impose additional regulatory requirements. Indeed, today's rule is being promulgated in response to a long standing request by local governments after substantial input from such local governments into the rule's development."

List of Subjects in 40 CFR Part 310

Environmental protection, Administrative practice and procedure, Hazardous substances, Incorporation by reference, Intergovernmental relations, Local governments, Reporting and recordkeeping requirements, Superfund.

Dated: January 27, 1998.

Carol Browner,

Administrator.

For the reasons set out in the preamble, EPA amends title 40, chapter I of the Code of Federal Regulations by revising part 310 to read as follows:

PART 310—REIMBURSEMENT TO LOCAL GOVERNMENTS FOR EMERGENCY RESPONSE TO HAZARDOUS SUBSTANCE RELEASES

Subpart A—General Information

Sec.

310.1 What is the purpose of this part?
310.2 What is the statutory authority for this part?
310.3 What terms have specific definitions?
310.4 What abbreviations should I know?

Subpart B—Provisions

Who Can Be Reimbursed

310.5 Am I eligible for reimbursement?
310.6 Are states eligible?
310.7 Can more than one local agency or government be reimbursed for response to the same emergency?

What Can Be Reimbursed

310.8 Can EPA reimburse the entire cost of my response?
310.9 If more than one local agency or government is involved, can each receive up to $25,000?
310.10 What are temporary emergency measures?
310.11 What costs are allowable?
310.12 What costs are NOT allowable?

How to Get Reimbursed

310.13 Do I need to notify anyone while the response is underway?
310.14 Must I try to recover my costs from those potentially responsible for the emergency?
310.15 How do I apply for reimbursement?
310.16 What kind of cost documentation is necessary?
310.17 Are there any other requirements?
310.18 How will EPA evaluate my application?
310.19 Under what conditions would EPA deny my request?
310.20 What are my options if EPA denies my request?
310.21 How does EPA resolve disputes?

Other Things You Need to Know

310.22 What records must I keep?
310.23 How will EPA rank approved requests?
310.24 What happens if I provide incorrect or false information?

Appendices to Part 310

Appendix I to Part 310—FREQUENTLY ASKED QUESTIONS
Appendix II to Part 310—EPA Regions and NRC Telephone Lines
Appendix III to Part 310—FORM: Application for Reimbursement to Local Governments for Emergency Response to Hazardous Substance Release Under CERCLA Sec. 123

Authority: 42 U.S.C. 9611(c)(11), 9623.

Subpart A—General Information

§ 310.1 What is the purpose of this part?

This part sets up procedures for EPA to reimburse local governments for certain emergency response costs. Local

governments may receive up to $25,000 to help lighten financial burdens related to emergency response to hazardous substance releases. This reimbursement does NOT replace funding that local governments normally provide for emergency response.

§ 310.2 What is the statutory authority for this part?

This part is authorized under section 123 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (Pub. L. 96–510, 42 U.S.C. 9601–9675), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (Pub. L. 99–499, 42 U.S.C. 9601).

§ 310.3 What terms have specific definitions?

For purposes of this part except when otherwise specified:

(a) *Application* means Form 9310–1, shown in Appendix III of this part, including all documentation and additional information you submit to support a request for reimbursement.

(b) *Date of completion* means the date when you have completed all field work and you have received all deliverables (such as lab results, technical expert reports, or invoices) due under a contract or other agreement.

(c) *Emergency Planning and Community Right-to-Know Act of 1986* means Title III—Emergency Planning and Community Right-to-Know Act of the Superfund Amendments and Reauthorization Act of 1986 (EPCRA) (Pub. L. 99–499, 42 U.S.C. 11000–11050).

(d) *Federally-recognized Indian Tribe*, as defined by section 101(36) of CERCLA, means any Indian Tribe, band, nation, or other organized group or community, including any Alaska Native village but not including any Alaska Native regional or village corporation, which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

(e) *General purpose unit of local government* means the governing body of a county, parish, municipality, city, town, township, Federally-recognized Indian tribe or similar governing body. This term does not include special purpose districts.

(f) *Hazardous substance.* (1) *Hazardous substance*, as defined by section 101(14) of CERCLA, means:

(i) Any substance designated pursuant to section 311(b)(2)(A) of the Federal Water Pollution Control Act (Pub. L. 101–380, 33 U.S.C. 1251 *et seq.*);

(ii) Any element, compound, mixture, solution, or substance designated pursuant to section 102 of CERCLA;

(iii) Any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (Pub. L. 89–272, 42 U.S.C. 3259 *et seq.*) (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress);

(iv) Any toxic pollutant listed under section 307(a) of the Federal Water Pollution Control Act (Pub. L. 101–380, 33 U.S.C. 1251 *et seq.*);

(v) Any hazardous air pollutant listed under section 112 of the Clean Air Act (42 U.S.C. 7401–7642); and

(vi) Any imminently hazardous chemical substance or mixture with respect to which the Administrator has taken action pursuant to section 7 of the Toxic Substances Control Act (Pub. L. 94–469, 15 U.S.C. 2601–2629).

(2) The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under paragraphs (f)(1)(i) through (f)(1)(vi) of this section, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

(g) *Local emergency response plan* means the emergency plan prepared by the Local Emergency Planning Committee (LEPC) as required by section 303 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA or SARA Title III).

(h) *National Contingency Plan* means the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR part 300).

(i) *National Response Center* means the national communications center located in Washington, DC, that receives and relays notice of oil discharge or releases of hazardous substances to appropriate Federal officials.

(j) *Pollutant or contaminant*, as defined by section 104(a)(2) of CERCLA, includes, but is not limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring. The term does not include petroleum, including crude oil and any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under section 101(14)(A) through (F) of CERCLA, nor does it include natural gas, liquefied natural gas, or synthetic gas of pipeline quality (or mixtures of natural gas and such synthetic gas).

(k) *Potentially responsible party* (PRP) means any person who may be liable under section 107 of CERCLA for a release or threatened release of hazardous substances or pollutants or contaminants.

(l) *Release*, as defined by section 101(22) of CERCLA, means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injection, escaping, leaching, dumping, or disposing into the environment, but excludes: any release that results in exposure to persons solely within a workplace, with respect to a claim that such persons may assert against the employer of such persons; emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine; release of source, by-product or special nuclear materials from a nuclear incident, as those terms are defined in the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.), if such release is subject to requirements with respect to financial protection established by the Nuclear Regulatory Commission under section 170 of such act, or, for the purpose of section 104 of CERCLA or any other response action, any release of source, by-product, or special nuclear material from any processing site designated under section 122(a)(1) or 302(a) of the Uranium Mill Tailings Radiation Control Act of 1978 (Pub. L. 95–604, 42 U.S.C. 2014 et seq.); and the normal application of fertilizer. For purposes of this part, release also means the threat of release.

(m) *Single response* means all of the concerted activities conducted in response to a single episode, incident, or threat causing or contributing to a release or threatened release of hazardous substances, or pollutants or contaminants.

§ 310.4 What abbreviations should I know?

The following abbreviations appear in this part:

CERCLA—The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Pub. L. 96–510, 42 U.S.C. 9601–9675), as amended by the Superfund Amendments and Reauthorization Act of 1986, also known as Superfund.

EPA or the Agency—Environmental Protection Agency.
EPCRA—Emergency Planning and Community Right-to-Know Act of 1986 (Pub. L. 99-499, 42 U.S.C. 11000-11050).
LEPC—Local Emergency Planning Committee.
NCP—National Oil and Hazardous Substances Pollution Contingency Plan also known as the National Contingency Plan (40 CFR part 300).
NRC—National Response Center.
OMB—Office of Management and Budget.
PRP—Potentially Responsible Party.
SARA—The Superfund Amendments and Reauthorization Act of 1986 (Pub. L. 99-499, 42 U.S.C. 9601).
SERC—State Emergency Response Commission.
USCG—U.S. Coast Guard.

Subpart B—Provisions

Who Can Be Reimbursed?

§ 310.5 Am I eligible for reimbursement?

If you are the governing body of a county, parish, municipality, city, town, township, federally-recognized Indian tribe or general purpose unit of local government, you are eligible for reimbursement. This does not include special purpose districts.

§ 310.6 Are states eligible?

States are NOT eligible for reimbursement under this part, and states may NOT request reimbursement on behalf of their local governments.

§ 310.7 Can more than one local agency or government be reimbursed for response to the same incident?

No. EPA will accept only one reimbursement request for a single response. A single response includes all of the temporary emergency measures that ALL local governments or agencies conduct in response to a single hazardous substance release. If more than one local government or agency responds, you must decide among yourselves who will request reimbursement on behalf of all.

What Can Be Reimbursed?

§ 310.8 Can EPA reimburse the entire cost of my response?

Possibly not. EPA can only reimburse you for temporary emergency measures you take in response to releases of hazardous substances, pollutants, or contaminants. The statute allows reimbursement for only certain costs, and by statute, the total amount of the reimbursement may not exceed $25,000 for a single response.

§ 310.9 If more than one local agency or government is involved, can each receive up to $25,000?

No. The maximum amount EPA can reimburse is $25,000 for a single response, which includes all activities by ALL local responders. If the costs incurred by multiple local governments or agencies exceed $25,000, you must decide among yourselves how the total reimbursement will be divided.

§ 310.10 What are temporary emergency measures?

(a) Temporary emergency measures are actions taken to control or eliminate immediate threats to human health and the environment.

(b) Examples of temporary emergency measures are:

(1) Site security;

(2) Controlling the source of contamination;

(3) Containing the release to prevent spreading;

(4) Neutralizing or treating pollutants released; and

(5) Controlling contaminated runoff.

§ 310.11 What costs are allowable?

(a) Reimbursement under this part does NOT supplant funds you normally provide for emergency response. Allowable costs are only those necessary for you to respond effectively to a specific incident that is beyond what you might normally respond to.

(b) Examples of allowable costs are:

(1) Disposable materials and supplies you acquired and used to respond to the specific incident;

(2) Payment of unbudgeted wages for employees responding to the specific incident (for example, overtime pay for response personnel);

(3) Rental or leasing of equipment you used to respond to the specific incident (for example, protective equipment or clothing, scientific and technical equipment) (Note: rental costs are only allowable for the duration of your response; once you complete the response to the specific incident, further rental costs are NOT allowable);

(4) Replacement costs for equipment you own that is contaminated or damaged beyond reuse or repair, if you can demonstrate that the equipment is a total loss and that the loss occurred during the response (for example, self-contained breathing apparatus irretrievably contaminated during the response);

(5) Decontamination of equipment contaminated during the response;

(6) Special technical services specifically required for the response (for example, costs associated with the time and efforts of technical experts/specialists that are not on your staff);

(7) Other special services specifically required for the response (for example, utilities);

(8) Laboratory costs of analyzing samples that you took during the response;

(9) Evacuation costs associated with the services, supplies, and equipment that you procured for a specific evacuation; and

(10) Containerization or packaging cost and transportation and disposal of hazardous wastes.

(c) To be allowable, costs must:

(1) NOT be higher than what a careful person would spend for similar products or services in your area; and

(2) Be consistent with CERCLA and the federal cost principles outlined in OMB Circular A-87, "Cost Principles for State and Local Governments." (Copies of the circular are available from the Office of Administration, Publications Office, New Executive Office Building, 725 17th Street, NW., Room 2200, Washington, DC 20503.)

(d) EPA will make final determinations on whether your costs are reasonable.

§ 310.12 What costs are NOT allowable?

(a) Costs that are NOT allowable are expenditures you incur in providing what are traditionally local services and responsibilities. Examples include:

(1) Routine firefighting;

(2) Preparing contingency plans;

(3) Training; and

(4) Response drills and exercises.

(b) Costs that are NOT allowable also include items such as supplies, equipment, and services that you routinely purchase to maintain your ability to respond effectively to hazardous releases when they occur. Examples of other costs that are NOT allowable are:

(1) Purchase or routine maintenance of durable equipment expected to last one year or more, except when contaminated or damaged as described in § 310.11(b)(4) and (b)(5);

(2) Materials and supplies you did NOT purchase specifically for the response;

(3) Rental costs for equipment that you own or that another unit of local government owns;

(4) Employee fringe benefits;

(5) Administrative costs for filing reimbursement applications;

(6) Employee out-of-pocket expenses normally provided for in your operating budget (for example, meals or fuel);

(7) Legal expenses you may incur due to response activities, including efforts to recover costs from PRPs; and

(8) Medical expenses you incur due to response activities.

How to get Reimbursed

§ 310.13 Do I need to notify anyone while the response is underway?

No. You should notify EPA, the National Response Center, or use another established response communication channel, but it is not a requirement for reimbursement. Telephone numbers for EPA regional offices and the NRC are in Appendix II to this part.

§ 310.14 Must I try to recover my costs from those potentially responsible for the emergency?

Yes. Before applying for reimbursement from EPA, you must try to recover your costs from all known potentially responsible parties (PRPs). After you ask them for payment, you should give PRPs 60 days either to pay you, express their intent to pay you, or indicate willingness to negotiate. You must also try to get reimbursed by other sources (for example, your insurance company or your state). If you are not successful, you must certify on your reimbursement application that you made a good-faith, reasonable effort to recover your costs from other sources before applying to EPA. If you recover any portion of the costs from these sources after you receive reimbursement from us, you must return the recovered amount to EPA.

§ 310.15 How do I apply for reimbursement?

(a) You must apply for reimbursement on EPA Form 9310–1, shown in Appendix III to this part.

(b) You must submit your request within one year of the date you complete the response for which you request reimbursement. If you submit your application late, you must include an explanation for the delay. We will consider late applications on a case-by-case basis.

(c) Your application must be signed by the highest ranking official of your local government (for example, mayor or county executive), or you must include a letter of delegation authorizing a delegate to act on his or her behalf.

(d) Mail your completed application and supporting data to the LGR Project Officer, (5204–G), Office of Emergency and Remedial Response, Environmental Protection Agency, 401 M Street SW, Washington DC 20460.

§ 310.16 What kind of cost documentation is necessary?

Cost documentation must be adequate for an audit. At a minimum, you must:

(a) Include a description of the temporary emergency measures for which you request reimbursement;

(b) Specify the local agency that incurred the cost, (such as, the Town Fire Department, the County Health Department, or the City Department of Public Works);

(c) Include invoices, sales receipts, rental or leasing agreements, or other proof of costs you incurred; and

(d) Certify that all costs are accurate and that you incurred them specifically for the response for which you are requesting reimbursement.

§ 310.17 Are there any other requirements?

(a) You must certify that reimbursement under this regulation does not supplant local funds that you normally provide for emergency response. This means that the reimbursement you request is for costs you would not normally incur; rather, they are for significant, unanticipated costs related to a specific incident beyond what you normally respond to.

(b) You must also certify that your response actions are not in conflict with CERCLA, the National Contingency Plan (NCP), and the local emergency response plan prepared by your Local Emergency Planning Committee, if there is one. If you need help with this requirement, contact the LGR Help line (800–431–9209) or your EPA regional office.

(c) You, as a local government, should be included in the local emergency response plan completed by your LEPC, as section 303(a) of EPCRA requires. This does not apply if your State Emergency Response Commission (SERC) has not established an LEPC responsible for the emergency planning district(s) that encompasses your geographic boundaries.

§ 310.18 How will EPA evaluate my application?

(a) When we receive your application, we will make sure it meets all requirements of this section. If your request is incomplete or has significant defects, we will contact you for additional information. You should provide any additional information within 90 days. If you don't provide requested information within a year, we may deny your application.

(b) If your application meets all requirements, we will consider whether the costs claimed are allowable and reasonable. We will then send you written notification of our decision to award or deny reimbursement in full or in part.

§ 310.19 Under what conditions would EPA deny my request?

We may deny your reimbursement request in full or in part if:

(a) Your records, documents, or other evidence are not maintained according to generally accepted accounting principles and practices consistently applied;

(b) The costs you claim are NOT reasonable or allowable, that is, they are higher than what a careful person would spend for similar products or services in your area; or

(c) You do not supply additional information within one year from when we request it; and

(d) Reimbursement would be inconsistent with CERCLA section 123, or the regulations in this part.

§ 310.20 What are my options if EPA denies my request?

If we deny your request because you failed to meet a requirement in this regulation, you may request, in writing, that EPA grant an exception. You may also file a request for an exception with your initial application. In your request for an exception, you must state the requirement you cannot comply with and the reasons why EPA should grant an exception. We will grant exceptions only if you establish good cause for the exception and if granting the exception would be consistent with section 123 of CERCLA.

§ 310.21 How does EPA resolve disputes?

(a) The EPA reimbursement official's decision is final EPA action unless you file a request for review by registered or certified mail within 60 calendar days of the date you receive our decision. Send your request for review to the address given in § 310.15(d).

(b) You must file your request for review with the disputes decision official identified in the final written decision.

(c) Your request for review must include:

(1) A statement of the amount you dispute;

(2) A description of the issues involved;

(3) A statement of your objection to the final decision; and

(4) Any additional information relevant to your objection to EPA's decision.

(d) After filing for review:

(1) You may request an informal conference with the EPA disputes decision official;

(2) You may be represented by counsel and may submit documentary evidence and briefs to be included in a written record; and

(3) You will receive a written decision by the disputes decision official within 45 days after we receive your final submission of information unless the

official extends this period for good cause.

Other Things You Need To Know

§ 310.22 What records must I keep?

(a) If you receive reimbursement under the regulations in this part, for three years you must keep all cost documentation and any other records related to your application. You must also provide EPA access to those records if we need them.

(b) After three years from the date of your reimbursement, if we have NOT begun a cost recovery action against a potentially responsible party, you may dispose of the records. You must notify EPA of your intent to dispose of the records 60 days before you do so, and allow us to take possession of these records beforehand.

§ 310.23 How will EPA rank approved requests?

(a) If necessary, EPA will rank approved reimbursement requests according to the financial burden the response costs impose on the local governments. We will estimate your financial burden by calculating the ratio of your allowable response costs to your annual per capita income adjusted for population. We will make adjustments for population so that a large city with a low per capita income will not necessarily receive a higher rank than a small town with a slightly higher per capita income. We will also consider other relevant financial information you may supply.

(b) We will use the per capita income and population statistics published by the U.S. Department of Commerce, Bureau of the Census, in Current Population Reports, Local Population Estimates, Series P–26, "1988 Population and 1987 Per Capita Income Estimates for Counties and Incorporated Places," Vols. 88–S–SC, 88–ENC–SC, 88–NE–SC, 88–W–SC, 88–WNC–SC, March 1990. The Director of the Federal Register has approved this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies are available from the Bureau of the Census, Office of Public Affairs, Department of Commerce, Constitution Avenue, NE., Washington, DC 20230 (1–202–763–4040). You may review a copy at the U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460 or at the Office of the Federal Register, 800 N. Capitol Street, NW., 7th Floor, Suite 700, Washington, DC.

(c) Larger ratios receive a higher rank. We will reimburse requests with the highest ranks first. Once we rank your request, we will either:

(1) Reimburse the request; or

(2) Hold the request for reconsideration once additional funding is available.

(d) The EPA reimbursement official will give you a written decision on whether the request will be reimbursed or held for future reconsideration.

§ 310.24 What happens if I provide incorrect or false information?

(a) You must not knowingly or recklessly make any statement or provide any information in your reimbursement application that is false, misleading, misrepresented, or misstated. If you do provide incorrect or false information, and EPA relies on that information in making a reimbursement decision, we may deny your application and withdraw or recover the full amount of your award. In such a case, we would give you written notice of our intentions.

(b) If you, as a reimbursement applicant or someone providing information to the applicant, knowingly give any false statement or claim as part of any application for reimbursement under section 123 of CERCLA, you may be subject to criminal, civil, or administrative liability under the False Statement Act (Pub. L. 97–398, 18 U.S.C. 1001) the False Claims Act (Pub. L. 99–562, 31 U.S.C. 3729), and the Program Fraud and Civil Remedies Act (Pub. L. 99–509, 31 U.S.C. 3801).

Appendices to Part 310

Appendix I to Part 310—Frequently Asked Questions

(1) Can I be reimbursed for hazmat team salaries?

Generally, no; only unbudgeted overtime and/or extra time can be considered for reimbursement. (§ 310.11(b)(2))

(2) Will I be reimbursed for the cost of a destroyed fire truck?

Up to $25,000 of the cost of a lost fire truck can be considered an allowable cost and therefore, reimbursable. However, if the local government has insurance covering such losses, then we would not reimburse you for a destroyed fire truck. (§§ 310.11(b)(4) and 310.14)

(3) If I have a release in an elementary school, can the school district apply for reimbursement?

No, for purposes of the regulation in this part, a school district is considered a special purpose district of local government and therefore not eligible for reimbursement. The county or city where the incident happened may apply for reimbursement on behalf of the school district. (§§ 310.03(e) and 310.05)

(4) Why are incidents that involve a release of petroleum not eligible?

Because this program is authorized under CERCLA, and petroleum is excluded under CERCLA, we can't reimburse you for response to releases involving only petroleum. If, however, some hazardous substances are also involved, your incident may be reimbursed. (§ 310.03(f))

(5) Can I be reimbursed for laying water lines to a community whose drinking water is affected by a release?

No, laying water lines doesn't fall within the definition of temporary emergency measures. Providing bottled water on a temporary emergency basis is reimbursable. (§ 310.10(a))

(6) What if EPA gets too many applications in one year?

In the beginning of the program, there was a statutory limitation on the amount of the Superfund that could be used for reimbursements. That limitation was approximately $1,000,000. The limitation has expired, and EPA has only reimbursed slightly over $1,000,000 in ten years. There has not been a year where we received too many applications.

(7) If I incur significant costs trying to recover from the PRP, can I be reimbursed by EPA for those costs?

No, legal expenses are not allowable costs. (§ 310.12(b)(7)).

(8) Can I add attachments to the Application Form?

Yes, attach any additional information that you feel is necessary. EPA will review all the information that you send.

(9) Do I have to notify EPA before I send an application in, or before I take a response action?

No, you aren't required to notify EPA in either case. We do suggest that you call the National Response Center to report the hazardous substance release, or if you use other response reporting channels, use them. If you need some help before submitting your application, we do suggest you call the LGR Help line (800–431–9209).

(10) If two incidents happen in my town, within hours of each other, do I have to submit two separate applications?

You aren't required to submit separate applications in this case, but if your total response costs are more than $25,000, it may be in your interest to submit separate applications for each single response. (§ 310.9)

Appendix—II to Part 310—EPA Regions and NRC Telephone Lines

National Response Center	(800) 424–8802
EPA Regional Phone Numbers:	
Region I (ME, NH, VT, MA, RI, CT)	(617) 223–7265
Region II (NJ, NY, PR, VI)	(908) 548–8730
Region III (PA, DE, MD, DC, VA, WV)	(215) 597–9898
Region IV (NC, SC, TN, MS, AL, GA, FL, KY)	(404) 347–4062
Region V (OH, IN, IL, WI, MN, MI)	(312) 353–2318
Region VI (AR, LA, TX, OK, NM)	(215) 655–2222
Region VII (IA, MO, KS, NE)	(913) 236–3778
Region VIII (CO, UT, WY, MT, ND, SD)	(303) 293–1788

Region IX (AZ, CA, NV, AS, HI, GU, TT)	(415) 744–2000	Region X (ID, OR, WA, AK)	(206) 553–1263

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Appendix—III to Part 310—Form: Application for Reimbursement to Local Governments for Emergency Response to Hazardous Substance Release Under CERCLA Sec. 123

EPA Form 9310-1, Application for Reimbursement to Local Governments

Please type or print all Information

EPA	United States Environmental Protection Agency Washington, D.C. 20460 **Application for Reimbursement to Local Government for Emergency Response to Hazardous Substance Releases Under CERELA Sec. 123**	Form Approved OMB No 2050-0077 Approved expires

1. Local government Identification

a. Name of Local government	b. Contact Name and Telephone Number
c. Official Address	d. Date of Application

2. Release Description

a. Date and Time of Occurrence or Discovery	b. Location
c. Source or Cause of Release	
d. Hazardous Substances Released and Quantity (Petroleum, crude oil, or any unspecified fractions thereof are excluded)	
e. Threats to human health and Environmental	
f. Attach any additional material pertinent to the release	

3.Response Description

a. Date and Time of HazMat Response Initiation	b. Was anyone notified of the response? ☐ EPA ☐ NCR ☐ OTHER	
c. EPA Region	d. Date and Time Contact Made	e. Date of Response completion (Local government has received all data, reports, and charges for response)
f. Jurisdiction in Which Response Occurred	g. Is your local government a participant in the Title III Emergency Response Plan? (Check one) ☐ Yes ☐ No	
h. Responding Agencies and Jurisdictions		

EPA Form 9310-1

i. Summary of Response Actions

j. Temporary Measures for Which Reimbursement is Sought

4. Cost Information

a. Total Response Cost	b. Total Reimbursement Requested
$	$

c. Complete and Attach Table 1, "Detailed Cost Breakdown"

d. Complete and Attach Table 2, "Cost Recovery Summary"

e. Attach Other Pertinent Financial Information

5. Certification and Authorization (To be completed by highest ranking official of applying local government.)

I hereby certify that:

1) All costs are accurate and were incurred specifically for the response for which reimbursement is being requested.
2) Reimbursement for costs incurred for response activities does not supplant local funds normally provided for response
3) Cost recovery was pursued as presented in the attached Table 2: and
4) Reimbursement funds for which costs are later recovered will be returned to EPA

I further certify that I am authorized to request this reimbursement and to receive funds from the Federal Government.

Printed or Typed Name of Highest Ranking Local Government Official or Authorized Representative	Signature of Highest Ranking Local Government Official or Authorized Representative
Title	Date

Burden Statement:

The Agency requires applicants for reimbursement to submit an application package that demonstrates consistency with program eligibility criteria and certifies compliance with the reimbursement requirements. This information collection is necessary to ensure proper use of the Superfund and appropriate distribution of reimbursement awards among applicants. EPA will receive and closely evaluate reimbursement requests in accordance with 40 CFR 310 to ensure that the most deserving cases receive awards.

The public reporting and recordkeeping burden for this collection of information is estimated to average 9 hours per response annually. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, OPPE Regulatory Information Division, U.S. Environmental Protection Agency (2137), 401 M St., S.W., Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

EPA Form 9310-1

* Form 9310-1 is not considered complete unless it is signed by the highest ranking official of the local government requesting reimbursement, or signed by the authorized representative indicated in an enclosed letter delegating signature authority for this application process.

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ATTACHMENT 1 TO FORM 9310–1 COST ELEMENT CODES AND COMMENTS

[Cost Element Codes for use in Table 1]

Code	Cost category	Cost element	Comments
PC	Personnel Compensation.	PC1: Overtime—for services excess of the local agency's standard work day or work week.	Compensation of overtime costs incurred specifically for a response will be considered only if overtime is not otherwise provided for in the applicant's operating budget.
		PC2: Experts and consultants—for services rendered on a per diem or fee basis or for services of an intermittent, advisory nature.	
TR	Transportation	TR1: Passenger vehicle rental—for transportation of persons during evacuation.	Passenger and nonpassenger vehicle rental costs will be considered for private vehicles not owned or operated by the applicant or other unit of local government.
		TR2: Nonpassenger vehicle rental—for transportation of equipment or supplies.	
RC	Utilities	RC1: Utilities—for power, water, electricity and other services exclusive of transportation and communications.	Utility costs will be considered for private utilities not owned or operated by the applicant or other unit of local government.
OS	Other Contractual Services.	OS1: Contracts for technical or scientific analysis—for tasks requiring specialized hazardous sustance response expertise.	May include such items as specialized laboratory analyses and sampling.
		OS2: Decontamination services—for specialized cleaning or decontamination procedures and supplies to restore clothing, equipment or other serviceable gear to normal functioning.	
SM	Supplies and Materials.	SM1: Commodities—for protective gear and clothing, cleanup tools and supplies and similar materials purchased specifically for, and expended during, the response.	May include such items as chemical foam to suppress a fire; food purchased specifically for an evacuation; air purifying canisters for breathing apparatus; disposable, protective suits and gloves; and sampling supplies.
EQ	Equipment	EQ1: Replacement—for durable equipment declared a total loss as a result of contamination during the response.	Equipment replacement costs will be considered if applicant can demonstrate total loss and proper disposal of contaminated equipment.
		EQ2: Rents—for use of equipment owned by others	Equipment rental costs will be considered for privately owned equipment not owned or operated by the applicant or other unit of local government.

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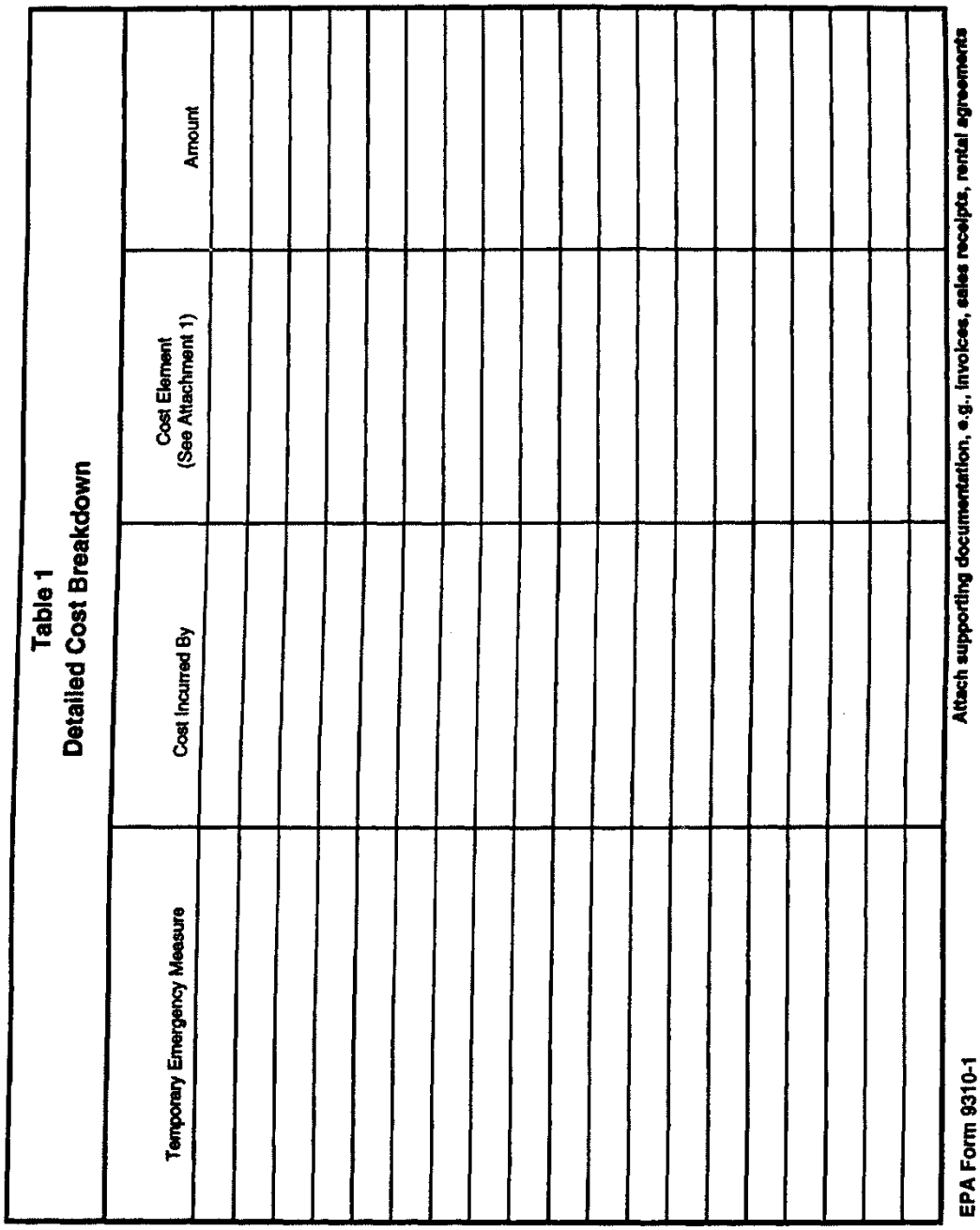


Table 1
Detailed Cost Breakdown

Temporary Emergency Measure	Cost Incurred By	Cost Element (See Attachment 1)	Amount

Attach supporting documentation, e.g., invoices, sales receipts, rental agreements

EPA Form 9310-1

Table 2
Cost Recovery Summary

Note: This "Cost Recovery Summary" must accompany each request for reimbursement.
You Must Fill Out Each Section Of This Form.

Name and Title of Source Contacted	Date(s) Contacted	Brief Summary of Response	Details Attached
Attempts to Recover Costs from Potentially Responsible Parties (including PRP Insurance)			
Attempts to Recover Costs from State Funding Sources			
Attempts to Recover Costs from Local Government Insurance			

EPA Form 9310-1

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UNIT 5: HAZMAT SPECIAL INCIDENT CONSIDERATIONS

TERMINAL OBJECTIVE

The students will be able to identify emerging hazardous materials/weapons of mass destruction (WMD) issues and effectively develop appropriate incident actions for hazmat/WMD special operations incidents.

ENABLING OBJECTIVES

The students will:

1. *Describe at least three operational considerations to address multidisciplinary, clandestine, meth drug lab operations at a hazmat/WMD incident.*

2. *Describe at least three operational considerations to address multidisciplinary, crime-scene operations at a hazmat/WMD incident.*

3. *Describe at least three operational considerations to address multidisciplinary, white powder/unknown packages operations at a hazmat/WMD incident.*

4. *Describe at least three operational considerations to address multidisciplinary, chemical assisted/detergent suicide operations at a hazmat/WMD incident.*

5. *Describe at least three operational considerations to address multidisciplinary, suicide bombings/mass fatalities operations at a hazmat/WMD incident.*

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CLANDESTINE METH DRUG LABS

Clandestine drug lab response is not a new problem for emergency first responders. The article "The Fire Service Should Know about Clandestine Drug Labs" appeared in the November 1970 issue of the National Fire Protection Association's (NFPA's) Fire Command. Why clandestine drug labs are so common is that methamphetamine (meth) is very simple and inexpensive to make. Most meth lab cookers learn to cook from other cookers or the Internet. According to the Drug Enforcement Administration (DEA) statistics, more than 99 percent of clandestine drug labs seized in 2008 were related to methamphetamine. In the United States, 6,783 meth lab incidents were reported that year. These incidents included labs, dumpsites, and chemical/glass/ equipment discoveries.

According to the Federal Bureau of Investigation (FBI), statistics and law enforcement records indicate that at least three meth lab cookers are killed by explosions or poison chemical incidents each year across the U.S. Numerous other cookers continue to receive injuries and burns for applying their trade. Likewise, the number of injuries to our nation's emergency first responders who respond, mitigate, investigate and dismantle these clandestine drug labs has greatly increased over the years. Current statistics also show property damage and injuries to the civilian population for clandestine drug labs have also dramatically increased. In the western U.S., some local municipalities have reported and documented that clandestine meth lab arrests have surpassed driving under the influence (DUI)/driving while intoxicated (DWI) arrests. Emergency first responders must ensure that they have implemented appropriate emergency response guidelines and procedures before these types of incidents occur in their jurisdictions.

Typically, meth is found in a white powder form that can easily dissolve in water. Another physical form of meth can be classified and identified as a clear chunky crystal, which is called crystal meth, or ice. Finally, meth can also be found and identified in the form of small, brightly colored tablets.

Emergency first responders should be able to identify the following list of household materials that can be used or found to produce meth:

- Pseudoephedrine, a drug contained in over-the-counter cold medicines and the primary ingredient needed to manufacture meth.
- Aluminum foil.
- Paint thinner.
- Lithium camera batteries.
- Mineral spirits.
- Charcoal lighter fluid.
- Anhydrous ammonia.
- Denatured alcohol.
- Matchbooks and matchbook striker plates.
- Rock.
- Table or Epsom salt.
- Camp fuel.
- Gas line antifreeze (methanol).

- Muriatic acid.
- Tincture of iodine (used to form crystals).
- Sulfuric acid.
- Lye (sodium hydroxide).
- Ammonium nitrate.
- Dry ice.
- Acetone.
- Coffee filters.
- Cheesecloth or napkins (to separate liquids from solids).
- Pots.
- Pans.
- Stoves or pressure cookers (cooking).
- Iced-tea jars, sports jars or glassware (to separate layers of liquids).
- Blenders.
- Ice chests.
- Liquefied petroleum gas (LPG) cylinders.
- Coolers.
- Turkey basters.
- Identified or unidentified chemical containers.

Emergency first responders will usually come across or identify a potential clandestine meth drug lab usually responding to other reported types of emergencies. Some examples are as follows:

- Medical aid calls with burn or smoke-inhalation victims.
- "Person-down" calls.
- Structure fires and rubbish fires, perhaps accompanied by explosions or "loud booms."
- Investigation calls (smoke investigations, odor complaints, illegal dumping and sick buildings).

If emergency responders do an appropriate scene size-up and situational awareness of the items in the room (lab) are common household items and in unusually large amounts, suspect that you are in a clan lab. Lye can be a great example and key indicator. Most common residential occupancies no longer have a can of lye; if they do, usually they only have one. If emergency first responders respond to an incident and identify 12 cans of lye on a table in the living room, there is a good chance that they have an incident in a clandestine meth lab. Attention to a complete size up and situational awareness can save a first responder's life.

The following may also be clues and identifiers that the incident could be at a clandestine meth drug lab:

- Large amount of cold tablet punch/blister packs that list ephedrine or pseudoephedrine as their primary medicinal ingredient.

- Jars containing clear liquid with a white- or red-colored solid on the bottom.

- Jars labeled as containing iodine or that contain dark, shiny, metallic, purple crystals.
- Jars labeled as containing red phosphorus or that contain a fine, dark red or purple powder.
- Coffee filters containing a white pasty substance, dark red sludge or small amounts of shiny white crystals.
- Bottles labeled as containing sulfuric, muriatic or hydrochloric acid.
- Bottles or jars with rubber tubing attached.
- Glass cookware or frying pans containing a powdery residue.
- An unusually large number of cans of camp fuel, paint thinner, acetone, lye, and drain cleaners containing sulfuric acid or bottles containing muriatic acid.
- Large numbers of lithium batteries, especially if they have been stripped.
- Soft silver or gray metallic ribbon (in chunk form) stored in oil or kerosene.
- Propane tanks with fittings that have turned blue.
- Occupants of the residence outside smoking.
- A strong smell of urine or unusual chemical smells such as ether, ammonia or acetone.

Emergency first responders can also identify exterior structural clues that they may be responding to an incident at a clandestine meth drug lab. These clues can include:

- Covered (plastic) or painted windows.
- Chemical odors.
- Homemade bars on doors or windows.
- Chemical containers and glassware (indoors or outdoors).
- Stains on walls and ceilings.
- Corrosion of metal surfaces.
- Unusual pipes or ducts coming from windows or walls.
- Fans in inappropriate places.
- Portable generators for outdoor sites.
- Propane tanks or other types of pressurized containers with unusual valves or attachments.
- Objects or people who seem out of place for the location or time of the call.

All the above indicators or clues are not sole proof that emergency first responders have discovered a clandestine drug lab, but they should raise a "red flag" and be reported to appropriate authorities.

The major hazards emergency first responders may encounter at a clandestine meth lab incident response are identified as the following:

- A flammable or an explosive atmosphere.
- An oxygen-deficient or toxic atmosphere.
- Leaking or damaged compressed gas cylinders.
- Clan labs in confined spaces.
- Water-reactive and pyrophoric chemicals.
- Damaged and leaking chemical containers.
- Electrical hazards and sources of ignition.
- Reactions in progress, which can include containers under high heat and high pressure.
- Incompatible chemical reactions.
- Bombs and booby traps.

Emergency first responders should always remember that incompatible reactive chemicals are being mixed and cooked in confined spaces. Tremendous amounts of hazardous waste can be produced and stored on site in unapproved containers. In addition to the chemical and process hazards present in clandestine meth labs, emergency first responders need to also be aware of methods to protect their operations. These methods can include antipersonnel devices, or booby traps. These protection method and devices are designed to protect the clandestine meth lab operators'/cookers' investment while they are away from the site and also to serve as warning methods or devices to aid in the owner's, operator's or cooker's escape. Unfortunately, they are designed to incapacitate or cause death to emergency first responders. Emergency first responders should not attempt to move, handle or disarm a confirmed or suspected improvised explosive device (IED), homemade explosive or booby trap.

Clandestine meth drug labs can cause three main types of harm to the occupancy, the community and the emergency first responders. These types of harm are identified as follows:

1. Physical injury from explosions, fires, chemical burns and toxic fumes.
2. Environmental hazards.
3. Child/Resident endangerment.

Emergency first responder preparation is the key to a successful operation at a clandestine meth drug lab. The first step in the preparation process is to properly train all emergency first responders to make them conduct an appropriate situational awareness and size-up of the hazards and risks associated with clandestine meth drug labs. If a potential clandestine meth drug lab is identified, alert local law enforcement and secure the area. The following emergency response procedures and guidelines shall be adopted at all incidents suspected of having a clandestine meth lab. These response guidelines and procedures are as follows:

- If emergency first responders are responding to a working fire in a structure or a vehicle containing a known lab, it is recommended they conduct rescues, protect exposures, and let the chemicals burn.
- Attempting to control the fire may be very hazardous for the emergency first responder entry team.
- Water and chemical runoff may be an environmental issue.
- If the initial fire attack is in progress when the location is identified as a clandestine meth drug lab, withdraw the attack teams and shift from an offensive to a defensive operation.
- Evacuate all structures surrounding the incident, and initiate hazmat control zones.
- Discontinue overhaul, and leave the structure if chemicals and drug apparatus are found.
- Carefully think through decontamination considerations before entry, especially in the case of emergency first responder emergencies.
- If a drug lab is found on entering a structure or at a vehicle, communicate and alert other first responders on-scene without delay, and do not touch or come in contact with anything, including light switches. Back out and evacuate immediately; watch for antipersonnel devices and other hazards.
- Emergency first responders should use care when interacting with a suspected meth user.
- Emergency first responders shall set up appropriate hazmat hazard control zones.
- Position all emergency response personnel and vehicles upwind, and isolate to keep all other people out of the area.
- Notify local law enforcement immediately. Remember it is a crime scene.
- Establish Unified Command.

Emergency first responder should not:

- Touch anything in the lab.
- Turn on or off any electrical power switches or light switches.
- Eat or drink in or around a lab.
- Open or move containers with chemicals or suspected chemicals.

- Smoke anywhere near a lab.
- Sniff any containers.

Emergency first responder should:

- Decontaminate yourself and your clothing.
- Wash your hands and face thoroughly.
- Call your local law enforcement or DEA district office.

Safety is paramount for all emergency first responders during these types of incidents.

WHITE POWDER AND SUSPICIOUS PACKAGE SCREENING

Ever changing local, national and world events have now placed our nation's first responders at the forefront of homeland defense. Today our first responders must be aware that due to terrorists, both foreign and domestic, we are continually being tested with our current response system.

A major event that brought the issue of white powder/suspicious package to the forefront with our nation's first responders occurred in October 2001. An individual contaminated the U.S. mail stream with anthrax, resulting in many actual and potential illnesses and deaths to innocent victims. Because of the easy access to information, the potential threat of similar attacks continues today. Emergency responders and local/regional hazmat teams are continually being called in to assess hoaxes and collect evidence of the suspected materials. These types of special response events happen anywhere, and no community is immune from the threat. To protect the health and safety of the public and to help deal with hoaxes and suspicious materials, clear standard operating procedures (SOPs) for assessing and managing biological threats are imperative and a must for everyone's safety.

Our nation's first line of defense, our first responders, must have proper procedures in place to determine the credibility of and the effective management of a suspected potential threat. To date, numerous first responder agencies across our nation have taken appropriate independent actions to address these potential response and health and safety needs of these complex events. However, it has been identified that these documented actions range from cursory attention to fully developed, detailed standard operating response procedures. The International Association of Fire Chiefs (IAFC) has developed and recommended the following model procedure. Based on sound principles, it complements the concepts of UC, promotes interoperability, and generates standard operating guidelines (SOGs) that all emergency responders will recognize.

The IAFC's model guideline is identified as the following:

- The purpose of these guidelines is to provide a model procedure for first-arriving emergency service personnel for addressing potential bioterror events primarily involving suspicious letters, packages or containers.

- This model provides a framework for building a local protocol tailored to a specific community. It was created to serve as a model for all types of fire departments in all types of communities.

- While some information may reach beyond the typical scope of the first responder, it is outlined so that a first responder will have knowledge of the broader process in which he or she may be requested or required to assist.

- This document specifically addresses biological threats delivered through a point source, such as those that may arrive in the mail or similar delivery systems. However, it should be noted that many of the procedures noted in this document would be similar to any bio-terror response.

First Arriving Emergency Service Personnel

Definition of a biological threat: any biological material capable of causing: death, disease or other biological malfunction in a human, an animal, a plant, or another living organism; deterioration of food, water, equipment, supplies or material of any kind; or harmful alteration of the environment. Also, an expression of intention to use any such material for such purposes.

Definition of emergency service: the industry comprised of fire, law enforcement and Emergency Medical Service (EMS) providers who respond to an emergency; includes emergency management.

Definition of a first responder: an emergency worker who responds to an incident within a set amount of time. The term is usually specific to fire, law enforcement and EMS' immediately arriving assets. Those arriving on scene at later intervals may be called a responder, an emergency responder, a secondary responder, a subject matter expert or a special law enforcement assignment.

Definition of a hazmat responder: a trained and certified individual who is a member of a hazardous material response team and qualified to respond to incidents involving toxic industrial chemicals, chemical warfare agents and other weapons of mass destruction (WMD). A hazmat response specialist will have additional training to respond to specific WMD.

Definition of a package: a letter, box, jar, suitcase or any other container that may hold a suspect material.

Definition of WMD: WMD may be any nuclear, biological, incendiary, chemical, explosive or radiological weapon that may be used for death or destruction. For the purpose of this document, we will be referring to only biological agents.

- Personnel safety is the number one priority in handling any suspected bioterror event.

- **Emergency Service Personnel Must:**

  - Perform a scene survey (size-up) that includes a risk assessment of the threat for an IED prior to approaching any suspicious package. If an explosive threat exists, or an explosion has occurred, evaluate the scene for a secondary IED. If an explosive threat exists, it will take precedence over any biological threat until rendered safe.

  - Not touch, move or open any suspicious package until a risk assessment on the package can be performed in coordination with hazmat personnel and law enforcement.

  - Notify appropriate law enforcement (local, state, FBI WMD coordinator, postal inspectors) when a potential threat is identified.

  - Don protective gloves (surgical, vinyl, etc.) as the **minimum** level of protective clothing for incidents involving suspicious packages.

  - Use National Institute for Occupational Safety and Health (NIOSH)-approved respiratory protection when the risk assessment indicates a respiratory threat. Many biological agents pose a significant health risk by inhalation.

  - Meet minimum competencies at the Hazardous Materials — technician level according to the following laws and standards when handling unknown or suspicious packages:

    -- Occupational Safety and Health Administration (OSHA): 29 Code of Federal Regulations (CFR) 1910.120 (q).

    -- Environmental Protection Agency (EPA): 40 CFR 311.

    -- NFPA: 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*.

  - Ensure that materials are safely packaged. Try to retain enough suspicious material (in accordance with NFPA 472 (2008 edition), Section 6.5) for:

    -- Laboratory analysis.

  - Use as criminal evidence, regardless of whether the threat is ultimately determined to be infectious, toxic or a criminal hoax.

  - Transfer custody of evidence to a law enforcement officer as soon as possible. Maintain chain of custody by obtaining a record of names and signatures every time custody of a suspicious material or sample for laboratory analysis changes hands.

  - Complete an incident report with the initial responding law enforcement agency, which will be forwarded to the local FBI WMD coordinator.

Responder Procedure: Assessment

Assess the hazard by:

- Gathering information from the reporting party, bystanders, witnesses and any other first responders.

- Determining who has physically had contact with the package.

- Conducting an initial evaluation of the package; consider using binoculars while standing a safe distance away from the suspicious package.

Responder Procedure: If the Answer to All Assessment Questions in Section is "No"

- If they are not already on the scene, law enforcement should be contacted and appraised of the incident, and a collective determination on the removal or disposal of the package should be agreed upon.

- The package should be placed in a sealable plastic bag and double-bagged.

- Anyone who touched the package should thoroughly wash hands or affected area with soap and water. A package that is not hazardous may still be unsanitary.

- Contact your Public Information Officer (PIO) and be prepared to face media coverage.

Responder Procedure: If the Answer to Any Assessment Questions in Section is "Yes"

- If they are not already on the scene, notify local law enforcement. Establish Unified Command with the lead emergency service agencies. Ensure all special called agencies (e.g., federal law enforcement, certified bomb squad, health department, etc.) are included in the Unified Command structure.

- Request special assistance (e.g., certified bomb squad, Decontamination Units, state and federal authorities, etc.) as soon as a threat requiring their involvement is identified.

- Control the scene.

  - Establish Hot, Warm and Cold Zones. The size of the hazard control zones should be based on the assessed threat. Depending on the scenario, the initial Hot Zone may range from the desk top in an office to an entire building, depending on the situation. Use barrier tape to cordon off open areas.

  - Shut down the building ventilation system if there has been a substance release.

- Turn off any high-speed mail processing equipment that may have handled the suspicious package.

- Isolate those who have been exposed or potentially exposed and consider shelter-in-place as an initial tactical consideration. Do not evacuate the building unless an immediate threat is evident. Individuals, including emergency service personnel, who contacted the package must be assessed for the need for decontamination (See Section IX. Level of decontamination may vary from washing with soap and water, to full gross decontamination) and transport to the hospital. Only under extreme medical emergency conditions should a contaminated victim be transported prior to decontamination. Contaminated, immediate-need victims must be placed in a protective envelope (e.g., Tyvek® suit) to minimize secondary contamination of the general population and/or environment.

- Consider location and well-being of those unexposed or unlikely exposed. Nonvictims may need to be gathered together for law enforcement interviews, or to receive information from public health or other officials to inform and allay fears.

- Request the assistance of the nearest qualified hazardous materials response team to assist with field screening for hazard assessment, sample collection, decontamination and other mitigation activities.

- Appropriate local or state law enforcement agency will notify FBI WMD coordinator.

- As needed, conduct a threat assessment conference call, via the FBI WMD coordinator, with the FBI Counter-Terrorism Division's Weapons of Mass Destruction Operations Unit (WMDOU), the FBI Laboratory Division, Hazardous Materials Response Unit (HMRU) and appropriate federal agencies. If available, also coordinate with the local threat assessment center.

- Contact your local public health department (who should in turn notify state authorities and the Center for Disease Control and Prevention (CDC)) if casualties are involved or a threat of public health exposure or environmental contamination exists.

- In coordination with law enforcement, notify the U.S. Postal Inspection Service (USPIS), whenever it appears that the threat was delivered through the U.S. Postal Service (USPS). Assist with ensuring that origin and tracking information is obtained from the package (ideally, photographs of the front and back).

- Treat the scene as a crime scene. Preserve evidence in coordination with law enforcement. If identified as a federal crime scene, assist the FBI HMRU in identifying and collecting biological evidence.

- Coordinate transport of public health samples to the closest Laboratory Response Network (LRN) facility with the FBI WMD coordinator.

- Be prepared to perform basic field screening of the biological sample to rule out radiation, oxidizers, flammability, corrosives, and volatile organic compounds to gain acceptance into the LRN, as coordinated with the FBI WMD coordinator.

- Identify and list the names of anyone who may have been exposed to the suspicious substance so they may be contacted when the LRN test results are available or if there is other additional information.

- In coordination with the FBI, identify a single point-of-contact for follow-up.

- Contact your Public Information Officer (PIO) and be prepared to intelligently relate to the media.

Decontamination Guidelines for Personnel Exposed to a Suspicious Package Containing Substance or Accompanied by a Threat

As an extra layer of precaution, some departments recommend exposed workers refrain from washing their clothes, keeping them bagged at home, until any investigation or lab tests are completed. These clothes may have evidentiary value.

- Unopened, no leak or exposure:

  - Thoroughly wash hands or affected area with soap and water.

  - Public health department may be notified for further assistance.

- Unopened, oily or granular leak, no exposure:

  - Thoroughly wash hands or affected area with soap and water.

  - Shower at home with soap and water.

  - Launder clothes separately in hot water with soap.

  - Public health department may be contacted for further assistance.

- Opened, no exposure:

  - Thoroughly wash hands or affected area with soap and water.

  - Public health department must be notified.

- Opened, oily or granular substance present, with exposure to:

  - Hands only (minimal contact):

-- Thoroughly wash hands or affected area with soap and water.

-- Change and place clothes in a sealed plastic bag.

-- Shower at home with soap and water, shampoo hair.

-- Launder clothes separately in hot water with soap.

-- Public health department must be notified.

- Hands and clothes:

-- Remove clothes and seal in plastic bag onsite.

-- Gross decontamination by emergency service that is based on and justified by the hazard assessment.

-- Transport to medical facility for evaluation **after** decontamination.

-- Leave contaminated clothes onsite for later pick-up by public health or other appropriate agency.

Identifying Suspicious Packages

Based on the CDC's FAQs regarding anthrax. www.bt.cdc.gov.

Suspicious Packages Should be Risk Assessed for Articulated Threats

Examples would include:

- Actual threat message in or on the package.
- Addressee in position of authority (e.g., government employee, political figure, private sector executive).
- Addressee in controversial business (e.g., Planned Parenthood, chemical industry, forestry).

What Kind of Packages Should be Considered Suspicious?

Some characteristics of suspicious packages and envelopes include the following:

- Inappropriate or unusual labeling.

- Excessive postage.
- Handwritten or poorly typed addresses.
- Misspellings of common words.
- Strange return address or no return address.
- Incorrect titles or title without a name.
- Not addressed to a specific person.
- Marked with restrictions, e.g. “Personal,” “Confidential” or “Do not X-ray.”
- Marked with any threatening language.
- Postmarked from a city or state that does not match the return address.

Appearance:

- Powdery substance felt through or appearing on the package.
- Oily stains, discolorations or odor.
- Lopsided or uneven envelope.
- Excessive packaging material such as masking tape, string, etc.

Other suspicious signs:

- Excessive weight.
- Ticking sound.
- Protruding wires or aluminum foil.

If a package or envelope appears suspicious, **nonemergency personnel should not open or touch it. Emergency personnel should limit direct contact with the package. Ideally, only those with hazardous material training should proceed to handle the package, when cleared by a certified bomb technician and deemed necessary.**

Sample Equipment List for First Responders

The primary route of entry for the biological agents is inhalation. **Protecting the respiratory system from exposure is the first priority in any incident.** The use of the appropriate level of respiratory protection cannot be overstated. A properly selected, properly fitted full face respirator offers emergency service personnel the highest level of protection.

Minimum Equipment

- Protective gloves (surgical, vinyl, etc.).
- NIOSH approved respirator.

  - Self-contained breathing apparatus (SCBA).

- Structural firefighting ensemble.

- Multi-gas detector.

  - Detects lower exposure limits (LEL) of explosive gases.
  - Photoionization detector.
  - Measures percent of oxygen by volume.

- Small, glass or plastic sterile vials with leak-proof caps.
- Small sterile, individually-wrapped, disposable spatula or scoop.
- Sealable plastic bags.
- Some pH paper.
- Starch iodine paper or equivalent.
- Radiological survey meters.
- Sterile distilled water.

Recommended Equipment

- NIOSH approved.

  - Air-purifying respirator (APR).
  - Powered air-purifying respirator (PAPR).
  - N-95 or P-100 Mask.

- Dosimeters to measure individual exposure.
- Response organizations should assess their capability to monitor or detect the following hazards. Determine if your local/regional Hazardous Materials Response Team has these detection capabilities.

  - Flammability.
  - Toxic industrial chemicals.
  - Chemical agents.
  - Oxygen deficiency or enrichment.
  - Measures parts per million (ppm) of volatile organic compounds (VOC).
  - Radioactive materials.

Equipment to measure most threats is available, but may be cost prohibitive to smaller agencies. Smaller agencies should consider:

- Pooling resources to purchase the equipment.

- Establishing regional teams that are proficient in using and operating the equipment.

- Establishing partnerships with other agencies (e.g., nearby military units, laboratories) that specialize in detecting or working with WMD agents.

Additional Information on Biological Weapons: Just One of Many Threats

Many different threats can be sent through the mail. The initial triage, or sorting and allocation of treatment to individuals according to a system of priorities for any threat situation, must consider **all** hazards. A critical element to be performed by the first responder is assessing for the presence of:

- Explosive devices.
- Radiological hazards.
- Chemical hazards.
- Biological hazards.

Effective, well-tested procedures exist for detection and response to explosive devices, chemicals and radiological materials. This document is specifically designed to deal with suspected biological threats.

Unlike chemical and radiological agents that are rapidly known and require immediate consequence management, biological agents are not as immediately recognizable and consequence management may be delayed, for example by therapy or vaccinations, and may be managed by health care workers. However, effective countermeasures are available against many of the bacteria, viruses and toxins that might be used. If we develop a solid understanding of the biological threats we face and how to respond to them, many effects may be prevented or minimized.

Biological Agents

Biological agents usually do not make people sick instantaneously. Most biological agents have an incubation period, which ranges from three to seven days. Final confirmatory test results will usually be available from the LRN laboratory in about two days, so there will be enough time to form and coordinate an appropriate response, including treatment when appropriate, before symptoms appear. Dramatic steps such as closing large buildings (but closing areas to the building where there is an incident and controlling access to that area are logical steps if the threat is viable) are not usually appropriate until the LRN results have been received. However, where other indicators raise suspicions, small areas may be isolated until the final report is received.

In the event that microbiological tests in an LRN laboratory produce a positive result, decisions regarding containment, isolation or quarantine and treatment of potentially exposed individuals must be made as an integrated process involving local public health, law enforcement and hazmat responders. Preplanning, training and rehearsal are essential to making this work. The process for responding in these circumstances is laid out in detail in the “Technical Assistance for Anthrax Response” issued by the National Response Team (www.nrt.org).

It is also important to note that some biological threats may not be aimed directly toward infecting people. They may be aimed at contaminating or otherwise decimating food supplies.

Agricultural bioterrorism can be carried out via the mail and can spread rapidly throughout commercial and private ranches and farms. For more information on agroterrorism, contact the U.S. Department of Agriculture (USDA) or visit www.aphis.usda.gov.

Diseases caused by:

- Bacteria:

  - Anthrax.
  - Tularemia.
  - Plague.
  - Brucellosis.
  - Cholera.
  - Q Fever.
  - Glanders.

- Viruses:

  - Smallpox.
  - Viral hemorrhagic fevers (Ebola, Marburg, Lassa, etc.).
  - Venezuelan Equine Encephalitis (VEE).

- Toxins:

  - Ricin.
  - Botulinum (Botulism).
  - Staphylococcal Enterotoxin B (SEB) (Food Poisoning).
  - Aflatoxin.

Media Coverage

Bioterror incidents will generate media interest regardless of the credibility of the threat. Be prepared to face intense media coverage of the incident.

It is imperative that the PIOs from first responding agencies coordinate their efforts from the outset of any potential bioterror event.

Media releases not carefully crafted jointly by public safety, public health and law enforcement can cause public panic, high demand on public health resources, and a negative impact on the criminal investigation.

- A PIO should be established to handle media inquiries.

- First responding agencies that do not have PIOs should defer to an agency within the Unified Command system that does employ one.

- Bioterror incidents usually involve several agencies. There may be several PIOs present, each representing the interests of his/her own agency. It is essential that PIOs use a joint information system with information coordinated among agencies before release.

CRIME-SCENE OPERATIONS

Many of the incidents that are responded to as hazmat events eventually may lead to criminal prosecution. Additionally, crimes that are committed with WMD are considered federal crimes and defined in U.S. Code Title 18.

It becomes the responsibility of all responders to preserve evidence at the incident scene. Most responders would never knowingly disturb or destroy evidence. However, the problem occurs when the responders do not recognize the evidence or potential evidence.

Law enforcement agencies have worked with other responders to recognize, identify and preserve evidence at hazmat/WMD crime scenes. This sometimes is referred to as the recognizing, identifying and preserving (RIP) process of evidence control.

Responders are not being asked to collect evidence unless they are specifically trained and requested to do so. Law enforcement personnel have specific protocols for collecting evidence and following a chain of custody of that evidence through the prosecution of the guilty party. All responders are requested to train and work with law enforcement agencies and to follow their local protocol regarding evidence issues.

CHEMICAL/DETERGENT ASSISTED SUICIDES

"Chemical suicide," also known as "detergent suicide," is an increasingly common method of committing suicide. It is often communicated as an easy, quick and painless way to end one's life. The technique originated in Japan but has been spreading across the U.S. via instructions posted on the Internet. Chemical suicide involves mixing two or more inexpensive, common household chemicals in an enclosed space. The chemical mixtures produce a heat-releasing (or exothermic) reaction and create toxic gases that quickly fill an enclosed area.

Chemical suicides typically occur in personal vehicles, closets, bathrooms, and other small, confined spaces where the concentration of gas can quickly accumulate to levels that are lethal, not only for suicide victims, but also to emergency responders. To prevent injury or death of emergency responders reporting to chemical suicides, it is essential to conduct a careful and detailed scene assessment and patient size-up in any situation involving an unresponsive person in an enclosed space.

First line emergency responders have been responding to chemical/detergent assisted suicides — which continue to gain in popularity — in the U.S. since 2008. To accomplish this low tech method of committing suicide, victims are mixing chemicals that are sulfur based compounds with an acid, both of which are found in common household cleaning agents, and when mixed together will create deadly hydrogen sulfide gas. The demographics are starting to shift to a younger crowd, and are now beginning to branch into different ideologies. It is now extremely important that all emergency responders continue to be vigilant in their approach to responding to such potential incidents.

Instructions for chemical and detergent assisted suicides continue to be easily obtained on the Internet, giving potential victims very explicit information on how to make and generate hydrogen sulfide gas. Victims today may use premade signs to identify potential chemical/ detergent suicide events. It has been documented that easily recognizable chemical/detergent assisted suicide incidents will have signs posted in the vehicle windows or inside the structure, as is the case in 90 percent of all of the identified incidents. The key however is that there can be no signs and little in the way of clues that first responders are responding to a chemical/detergent assisted suicide event. Below are key indicators of potential chemical or detergent suicide scenes:

- Unresponsive subject inside the vehicle. Someone committing suicide with the proper chemical mixtures will be dead instantly. A victim may have a seat belt fastened to prevent the body from falling into the horn alerting others.

- Subjects wearing goggles or gloves to prevent chemical burns before their death.

- Warning signs taped to the window or door of a vehicle or room. The sign may indicate **hazmat** or **suicide.**

- Yellow-green or white residue on a vehicle's seats or dashboard. This residue has been found in almost all chemical suicide cases.

- Windows fogged or tinted with yellow-green residue.

- Pennies in the vehicle or vehicle console area will be tarnished with residue.

- Smell of rotten eggs or sulfur, indicating the presence of hydrogen sulfide.

- Smell of bitter or burnt almonds, indicating the presence of hydrogen cyanide.

- Empty household cleaning containers on the floor board or seat of a vehicle.

- One or more large buckets visible.

- Vehicle's inside door handles removed, which prevents a subject who has changed his or her mind from stopping the suicide process.

- Duct tape, plastic or towels to cover air vents, windows, doors. This prevents the deadly chemical mixture from seeping out.

Another great area of concern for first responders is the migration from chemical/detergent assisted suicide to a new crime identified as a "chemical homicide." The possibility of meth labs or houses or other types of drug related locations may make a "hanging mixture" by placing an acid in a shallow pan, or some other type of shallow vessel and hanging the chemical sulfur in a zip-lock type baggie, attached to a release device. This toxic release can happen when a door or windows are opened; the sulfur is released into the acid, reacting almost instantaneously to create Hydrogen Sulfide gas. This method is designed to be placed literally in the face of the first responders causing immediate death or other serious health issues.

The National Hazardous Materials Fusion Center (http://www.hazmatfc.com) has other informational guides and reports for first responders who potentially respond to chemical/ detergent assisted suicides. They are identified as follows:

- Chemical Safety Alert: Portland Fire Rescue.

- Hydrogen Sulfide Suicide Trend and Chemical Suicides Guide for Dispatchers from the Central Florida Intelligence Exchange.

- Hazardous Materials Fusion Center's Guide on Chemical Assisted Suicide: Responder Information.

BOMBINGS/SUICIDE BOMBINGS

Over the last decade, suicide bombings have increased significantly in the Middle East, especially in Iraq and Afghanistan where our nation has a military presence. Since 9/11, there has not been a successful suicide bombing incident conducted within the U.S. However, current documented international trends have dictated that potential first responders study these international events and develop effective public safety response guidelines and procedures to deal with these potential horrific events. All first responders at all levels must work together under the UC structure to identify and deter potential suicide bombers from attacking locations in our local jurisdictions and to safely respond to potential events if a suicide bombing attack occurs.

Outlined in a September 2003 Department of Homeland Security (DHS) Bulletin titled "Tactics/Techniques of Suicide/Homicide Bombers," the bulletin advises: "Occurrences of such incidents overseas indicate terrorist interest in conducting suicide operations. Reasons for this interest include the relative ease with which these operations can be conducted and executed; the psychological impact on a population; and disruption at the scene of the event."

The reason operatives use suicide bombing approaches to carry out terrorism acts against vulnerable targets is that it gives the terrorists several operational advantages using a suicide bomb instead of a remotely detonated explosive:

- The suicide bombing device is precisely delivered to the intended target. A suicide bomber is sometimes referred to or identified in military environment as a "(human) smart bomb."

- Potential identified soft and hard targets can be easily attacked. Suicide bombers can drive vehicles that are designed purposely to attack fortified locations.

- No need to plan an egress or getaway route for the terrorist delivering the bomb.

- By design of the attack and bomb, no one is left alive to interrogate or investigate.

- A single, well-equipped suicide bomber can potentially wound or kill many innocent victims.

Using humans as bombs has been a preferred terrorist method of attack for more than 30 years, dating back to the original 1983 bombing of the U.S. Marine barracks in Lebanon; the Irish Republican Army's use of "proxy bombs" in the 1990s (in which a victim was kidnapped and forced to drive and then detonate a suicide car bomb); and approximately 100 suicide bombings executed by the Tamil Tiger rebel group in Sri Lanka beginning in 1987. Also in the 1990s, the Palestinian "Intifada" brought suicide bombings into Israeli cities.

In July 1997, New York City transit police stopped two subjects from carrying out a double suicide bombing against the subway system in Brooklyn, New York. The transit-police raid seized multiple live explosive devices just hours prior to their planned bombing incident. Additionally, a person planned a suicide bombing for New Year's Eve at the end of 1999. The suspect, who was identified as the "Millennium Bomber," was foiled when he was stopped and arrested at the U.S.-Canadian border. He was found and identified to be carrying explosives and planned to place a large suitcase bomb in the Tom Bradley International Airport terminal in Los Angeles, California.

The most current and devastating suicide attack on record in the world occurred on Sept. 11, 2001, when 19 confirmed terrorist hijackers flew passenger airplanes into the World Trade Center (WTC) and the Pentagon. In December 2001, Richard Reid, the so-called "shoe bomber," failed to take down an American Airlines flight by trying to detonate a bomb hidden in his shoe.

Former Defense Secretary Donald Rumsfeld stated in 2004 that the number one threat to the new government in Iraq and the U.S. forces would come from individuals acting as suicide bombers. In 2002, FBI Director Robert Mueller stated, "Suicide bombers are inevitable in the U.S.," and former Central Intelligence Agency (CIA) Counterterrorism Chief Vince Cannistraro stated, "There is no 100 percent defense against suicide bombers."

Suicide bombings have been documented to have occurred in more than 30 countries: Afghanistan, Algeria, Argentina, Bangladesh, China, Colombia, Croatia, Egypt, India, Indonesia, Iraq, Israel, Jordan, Kenya, Kuwait, Lebanon, Morocco, Pakistan, the Palestinian territories, Panama, the Philippines, Qatar, Russia, Saudi Arabia, Sri Lanka, Tanzania, Tunisia, Turkey, United Kingdom, Uzbekistan, and Yemen.

On July 7, 2005, four suicide bomber explosions rocked central London during the morning rush hour. More than 50 people were killed and 700 injured. The blasts occurred in a span of just 30 minutes, and it was well designed and coordinated. It is important for first responders to remember that these devices are built from readily available and easily purchased commercial and household chemicals and materials.

Currently today in Iraq, suicide bombings have become an almost daily occurrence, targeting American forces and Iraqi civilians.

There is an increased level of difficulty for communities and first responders to prevent such attacks from increasing because the new face of terror is ever changing. Recent international and local intelligence has indicated that al-Qaida and other designated terror organizations have been actively expanding their recruiting efforts of suicide bombers. This new recruitment philosophy includes females and Western-looking members. In Russia, Chechen terrorist suicide bombers include women, who downed two Russian airliners and seized a Beslan middle school, killing more than 330 hostages. Most of them were toward their identified target, who were children.

In the U.S., there have been numerous documented threats and incidents involving explosives carried by individuals. They include the following:

- September 1995: Mark Clark killed himself and his family in a car loaded with explosives in Baltimore County, Maryland.

- August 2003: An explosive device in Erie, Pennsylvania, killed an individual, possibly a victim; the device was attached to his neck during an attempted bank robbery.

- October 2005: A student blew himself up with an explosives-filled backpack at a crowded football game at Oklahoma State University.

Stopping suicide bombers is very difficult, if not impossible. Successful prevention is not always guaranteed. To be successful, first responders must understand some basic key indicators and tactics. These key indicators and tactics may help first responders prevent the initial attack, or at least protect the public from secondary attacks.

First responders must keep in mind that a “lone wolf” attacker, or a potentially mentally unstable individual, can bring into play the same type of tactics identified as those used by Islamic terrorists, and therefore some of these individuals most likely will not fall into any general terrorist activity profile.

First responders, such as fire, EMS, and law enforcement personnel, shall share the same priorities during a suicide bombing. Planning and interagency cooperation for any event should be the first priority. Several identified issues will need to be addressed during the planning phase: Law enforcement will need to provide security and crime scene perseveration. Law enforcement should also provide protection for the fire and EMS units entering the “Hot Zone.” First responders’ safety is paramount and the number one priority during this type of event.

The first step in first responder preparation is to conduct a review of your agency's guidelines and procedures when responding to these horrific types of events. NIOSH Fire Fighter Fatality Investigation and Prevention Program conducts investigations of firefighter line-of-duty deaths (LODDs) to formulate recommendations for preventing future deaths and injuries. The NIOSH report **FACE-F2004-11** listed the following recommendations for fire departments responding to scenes of horrific and severe violence:

- Develop SOPs for responding to potentially violent situations.

- Develop integrated emergency communication systems that include the ability to directly relay real-time information among the caller, dispatch and all responding emergency personnel.

- Provide body armor or bullet-resistant personal protective equipment (PPE); train with this equipment, and consistently enforce its use when responding to potentially violent situations.

- Ensure all emergency response personnel have the capability for continuous radio contact, and consider providing portable communication equipment that has integrated hands-free capabilities.

- Consider requiring emergency dispatch centers to incorporate the ability to archive location or individual historical data, and provide pertinent information to responding fire and EMS personnel.

- Develop coordinated response guidelines for violent situations, and hold joint training sessions with law enforcement, mutual aid and emergency response departments.

The long documented history of terrorists conducting suicide bombing events overseas has enabled first responders to potentially develop a profile of the nature of these events and their basic elements. These identified elements consist of:

- Men, women and older children have been suicide bombers.

- Targets have included buses, clubs, trains, restaurants, police checkpoints and other public locations where there are large groups of exposed people (also known as "soft targets").

- Generally, there is a disregard for "innocent victims" such as children.

- Devices have included belts, vests, jackets, backpacks, suitcases, shoes and even a guitar case. The devices typically consist of 10 to 30 pounds of explosives that can be easily hidden in clothing or other packaging systems.

- A few bombers have been killed or interdicted by police or military forces, and some have been identified by citizens, but most use the element of surprise: The detonation may be the first and only indication of an attack.

- Bombers will add or "salt" devices with nails, bolts, ball bearings and other items to act as shrapnel.

- Hazardous chemicals and pesticides also have been added to the explosive devices. Several bombs were detonated alongside deadly chlorine gas canisters in Iraq earlier this year.

- Poisons containing an anticoagulant that prevents blood clotting also have been used in suicide bombs, causing excessive bleeding.

- Bombers have been infected with diseases such as HIV and hepatitis, exposing their victims when the bomber is blown apart in the detonation.

- Ambulances have been used to transport bombers and devices. Recently, in Iraq, a suicide bomber-driven firetruck was used as a bomb against a U.S. Marine Corps outpost.

- Bombers have started using an armed assault to gain access into "hardened targets" before detonating.

- Responders have been targets of initial attacks and follow-up or secondary attacks.

It is important for first responders to remember that the "profile" detailed above will continue to evolve and "copycat" bombers attacking in the U.S. may choose to deploy new or as-yet-unseen suicide bombing tactics.

A potential suicide bombing incident presents first responders with complex tactical and technical problems requiring quick, logical and determined decision-making processes. In most cases, most first responders will be responding to a post-detonation incident, but first responders should be prepared to respond to pre-detonation and "trans-incident" suicide bombing events too.

The definition of a pre-detonation response occurs before the suicide bomber detonates the explosive device. The definition of a trans-incident response occurs when the bomber attempts to detonate the device, it malfunctions, and does not detonate; or when the suicide bomber makes the decision to surrender prior to detonation. The final definition of a post-detonation response takes place after the suicide bomber detonates the device.

Pre-Detonation Response

A fire department and EMS pre-detonation response can be identified or defined as when emergency first responders arrive on scene before there is an explosion. When there is a potential report of a possible suicide bomber, little time will be available for law enforcement and other first responder intervention if the suspect is indeed planning to carry out a suicide bomb mission, especially when he or she is possibly moving toward his or her intended potential target. Here are some identified recommended tactics for pre-detonation response for emergency responders:

- Call takers and dispatchers must get, document and record as much information as possible and make every effort to keep the suspected callers on the line during the identified response. Extreme specificity is crucial; ask all callers why a person is possibly identified as suspected of being a possible suicide bomber.

- All emergency first responders (fire, EMS and law enforcement) should approach the potential target and location without lights and sirens. This response procedure will avoid alerting the potential suspect and allows law enforcement personnel to choose the best approach to the scene.

- Park all emergency vehicles out of the suspect's potential line of sight.

- Law enforcement officers will need to approach the potential identified suicide bomber on foot, allowing the maximum opportunity to maintain a safe distance and perimeter between themselves and the suspect. This law enforcement emergency response procedure does **not** include fire or EMS personnel.

- Immediately one of the first priorities is to establish a properly designated Unified Incident Command Post (ICP) and fire and EMS Staging Areas well outside of the potential hazard zone.

- Based on potential, ever changing incident situations and conditions, there will be an overriding need for a rapid, coordinated emergency response.

- Establish a special emergency responder task force or strike team to respond out of the Staging Area if time, conditions and circumstances allow.

- Trained tactical medics should be staffed and be assigned to support law enforcement operations.

- SOGs must be implemented against the use of cellphones and radios.

- Emergency first responders should be prepared to establish flexible evacuation, areas of safe refuge, and containment areas. Rapid communications to accomplish these important tasks will be vital.

- If there is an explosion, there must be a controlled and coordinated emergency response into the potential affected and hazard areas.

- Emergency first responders should never touch or handle any type of IED or other suspicious devices or packages.

- If the identified and potential suspect is neutralized, and there is no explosion, emergency first responders should not render aid to the identified potential suspect. The identified potential suspect may only be injured, and the device could still be detonated remotely by a potential "handler." All devices and suspicious packages should always be considered live.

- Bomb squad members or robots must first approach an identified potential bomber or suspected suicide bomber.

Trans-Incident Response

A potential trans-incident emergency response incident can occur when a potential suicide bomber attempts to detonate the device, and it malfunctions or partially detonates; or when the suicide bomber decides not to go through with it and wishes to surrender. Special emergency response tactical considerations should include the following:

- Continual and constant communications with law enforcement personnel are essential.

- Potential suicide bombers appearing to surrender may use this tactic to draw in and kill law enforcement personnel and other emergency first responders.

- Even if a potential suicide bomber sincerely wants to surrender, first responders must remember that a second party ("handler") may still initiate the detonation of the suicide bomber remotely.

- Should responding first responders encounter a potential suicide bomber who wishes to surrender, minimum standoff distances must be incorporated and safely maintained at all times.

- Instruct the potential suicide bomber to remove all clothing and explosive devices. Once this response procedure and tactic is completed, bomb squad personnel will approach and handle the potential suicide bomber, his or her clothing items, and explosive devices remotely using special robots or equipment.

- First responders should never touch or handle any type of IED, device or suspicious package.

- All fire and EMS first responders will operate in a "stand-by mode" for this type of incident or event.

Post-Detonation Response

A fire department and EMS first responder post-detonation response situation will consist of a response to an incident after an explosion has taken place. A potential suicide bombing event or

incident can have an overwhelming potential for a large number of victims and fatalities and should also be classified as a mass casualty incident. All emergency first responders shall expect chaotic and horrific situations when they arrive on the scene. Special emergency response tactical considerations should include the following:

- All emergency first responders must proceed to the scene with extreme caution for their and the public's safety.

- Call takers and dispatchers must get, document and record as much information as possible, and stay on the line with the callers during the response.

- Communication and the establishment of a Unified Command system and post will assist the overriding need for a rapid, coordinated emergency response.

- Emergency responders must establish a Unified ICP and Staging Areas outside of the potential identified hazard area.

- First arriving units must conduct a rapid scene size-up or "windshield survey" and situational awareness.

- Law enforcement personnel must immediately start securing the area and disperse any crowds.

- Trained bomb technicians should immediately start searching for potential secondary explosive devices (IEDs) on loitering individuals, in suspicious packages or trash receptacles, or in parked vehicles during and after the emergency response phase of the incident.

- A potential suicide bombing incident has the potential for large numbers of victims with very traumatic and horrific injuries. Some seriously injured victims may have no visible signs of wounds, and many victims may be beyond help or deceased. First responders should expect numerous types of traumatic injuries resulting from blast pressure, burns, and shrapnel from an explosion. Properly trained tactical medics are a valuable asset to assist law enforcement in triaging victims during and after the emergency response.

- First responders should quickly remove victims from the potential blast area, and render aid in a safe and secure designated location remote from the Hot Zone. EMS personnel should conduct triage outside the identified hazard area. First response personnel shall use litters, blankets or backboards to quickly transport the victims from the hazard area to the identified triage area. All triage procedures shall be conducted twice — once at the blast scene area and again at the safe and secure remote triage area.

- All emergency response agencies shall implement their local mass-casualty/mass-fatality response procedures.

- All biohazard issues will need to be identified and addressed rapidly, as these incidents can have multiple traumatic injuries in one small location or many other levels. All appropriate decontamination procedures need to be implemented.

- All first responders shall immediately evaluate scene conditions and monitor for other hazards such as chemical agents, gases and radioactive materials.

- All first responders shall not touch or handle any type of IED or suspicious package.

- All fire and EMS shall not approach the potential suicide bombing suspect or suspect's remains regardless of his or her condition. Undetonated or partially detonated explosives or secondary devices may be present and intended for the first responder. All response procedures shall indicate that bomb squad personnel or robots must be the first to approach a bomber or suspected bomber no matter how long the wait or situation.

- All first responders shall be aware of the possibility of secondary devices and snipers or shooters in the response or Staging Areas. This type of event has targeted emergency first responders in the past.

- If emergency first responders encounter a vehicle or structural fire at this type of event, they must conduct a rapid knockdown while considering the preservation of evidence.

- Unified Command personnel shall establish a large crime-scene perimeter as soon as possible.

- All emergency first responders must leave emergency vehicles in place that are/were inside the blast/crime scene until the bomb squad can determine that they are safe to move and moving them will not destroy or alter key evidence.

- Unified Command must plan and implement procedures on an intensive local, regional and national media response.

- Unified Command must implement procedures to immediately notify local, state and federal resources.

- Unified Command must plan on and implement an extensive, multiday crime-scene investigation.

- Emergency first responders must always keep in mind and remember these events will be a very fluid, dynamic situation. First responders have been killed and seriously hurt at these types of incidents.

Secondary Devices

During any potential IED or suicide bombing response, emergency first responders should understand and plan for the possibility that a secondary device is present and may detonate.

Emergency first responders must conduct an appropriate situational awareness, be aware of their surroundings, and conduct appropriate search of critical areas such as the locations designated for the Unified Command Post (CP) and Staging. History has documented in the Middle East that there have been several incidents in which secondary devices were left unattended for emergency first responders. The same can hold true for documented suicide train bombings in Israel and in Madrid, Spain.

In the U.S., there have been several documented cases where secondary devices were planted and used against emergency first responders, such as those left by the convicted bomber, Eric Rudolph, of the 1996 Summer Olympics in Atlanta. During the 1999 Columbine High School mass shooting incident in Littleton, Colorado, several secondary devices were placed in the high school parking lots and near typical emergency services Staging Areas. The two identified mass shooting suspects and attackers in Littleton had watched the local fire department's response to fire alarms at the high school in the past and planted IEDs in those identified and designated areas.

Dispatching

Local emergency response dispatch centers should have systems and SOPs in place to dispatch emergency first responders to suspected suicide bombing or IED incidents. Key identifiable words such as "bombs" or "IEDs" should never be used over the radio system at potential suicide bombings; media and public could be listening. If at all possible, the appropriate procedure should incorporate that the specifics of an incident be given over a vehicle computer text system or by unit responding designated cellphones. In the event of a reported actual incident with a detonation with injuries, time can become critical, as there will be an overriding need for a rapid, coordinated unified emergency response.

History has documented that IED detonations have also been reported as other types of emergencies to emergency responders that can include the following:

- Potential medical calls with victims with burns or trauma.
- Potential "person-down or unconscious" calls.
- Potential structure or rubbish fires.
- Potential explosions or "loud booms" in certain areas.

Scene Management

The incident management and Unified Command system is a critical scene management tool emergency response agencies can use and implement in managing these types of horrific events. On being notified of an actual or suspected suicide bombing incident, the Unified IC should implement the five C's rule:

1. Confirm there is a device.
2. Clear the area.

3. Cordon off the location.
4. Control all entry and exit points.
5. Check the immediate area for secondary devices or hazards.

One potential major issue to be addressed during an appropriate situational awareness is the so-called process of a "double-tap" attack. This situation arises when minutes after a suicide bomber attack is delivered, a second suicide bomber will attack the emergency first responders or gathered crowds at the incident. A key element that UC can implement to a potential suicide bomber response, very similar to a hazardous materials response, is the use of "control zones." These control zones are identified as follows:

- Hot Zone (where the device is located).
- Warm Zone (where the perimeter will be established).
- Cold Zone (location of Unified CP and Staging).

Unified ICs should immediately notify all appropriate agencies — fire, EMS, law enforcement, bomb squad, emergency management and hospitals — as soon as possible if there is a report of an incident or a possible incident.

Emergency first responders shall maintain a safe separation distance from the potential suspected suicide bomber/explosives and suspicious packages at all times. According to several identified and documented guidelines, the minimum safe evacuation distance for a suicide belt loaded with 10 pounds of explosives is 1,100 feet. The minimum evacuation distance for a suicide vest with 20 pounds of explosives is 1,400 feet.

FINAL INCIDENT CONSIDERATIONS

DISASTER acronym:

D: Detection.
I: Incident Command.
S: Safety & Security.
A: Assess Hazards.
S: Support.
T: Triage & Treatment.
E: Evacuation.
R: Recovery.

- Always conduct a visual size-up of scene:

  - As you are on the way to the scene, prepare yourself mentally for what you may find.

- Make a visual assessment of the scene:

  - Anything unusual?

  - What type of incident is it?
  - Number of potential victims.
  - What type of victims?
  - Severity of their injuries.
  - How much and what kind of help will you need?

- Personal safety — is it safe to approach the scene or victim?
- Bystander and surrounding area safety.
- Curious onlookers pose many dangers.
- Victim safety — can I work on my patient, or must I move him or her to a safe place to work?
- Scene safety considerations.
- Be alert for safety hazards.
- Do not enter an area that may be unsafe until properly trained personnel assess the risks.
- Be alert for the possibility of a second explosive device.
- Staging should occur upwind and uphill.

SUMMARY

- Clandestine drug labs.
- White powder and suspicious package screening.
- Crime-scene operations.
- Chemical/Detergent assisted suicides.
- Bombings/Suicide bombings.
- DISASTER acronym.
- Final incident considerations.

ACTIVITIES

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Activity 5.1

Crime-Scene Management

Purpose

To recognize, identify and protect potential evidence.

Directions

1. You will watch the video “Crime Scene Video 1.”

2. Make a list of issues that may lead to the destruction of evidence.

3. Discuss those findings in class with the group.

4. You will watch the next section of video “Crime Scene Video 2” and discuss in the same manner.

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Activity 5.2

Chemical/Detergent Assisted Suicides

Purpose

To apply the appropriate strategic goals of an incident involving a simulated chemical/detergent assisted suicide, and determine appropriate tactical objectives. The response will primarily involve first responders trained to the operations level.

Directions

1. Review the material provided for the chemical/detergent assisted suicide incident.

2. Review resources for your city (Center City) as well as neighboring communities.

3. Complete the following assignments in your small groups:

    a. Determine critical size-up factors. Complete Size-Up Information Worksheet.

    b. Determine which hazmat strategic goals are to be used. Complete Strategic Goals/ Incident Objectives Worksheet.

    c. Determine what tactical objectives would be appropriate to meet the selected strategic goals. Complete Tactical Objectives Worksheet.

    d. Determine what decontamination measures are appropriate. Complete Decontamination and Critical Safety Factors Worksheet.

    e. Evaluate critical safety issues that are present, and determine what risk management measures you will implement. Complete Risk Management Worksheet.

    f. Complete Incident Command System (ICS) Form 201, Incident Briefing; ICS Form 202, Incident Objectives; ICS Form 203, Organization Assignment List; ICS Form 206, Medical Plan; and ICS Form 208HM, Site Safety and Control Plan as directed by instructors.

4. Diagram your incident management structure on an easel pad.

5. Select a representative to explain how you managed this incident.

Scenario

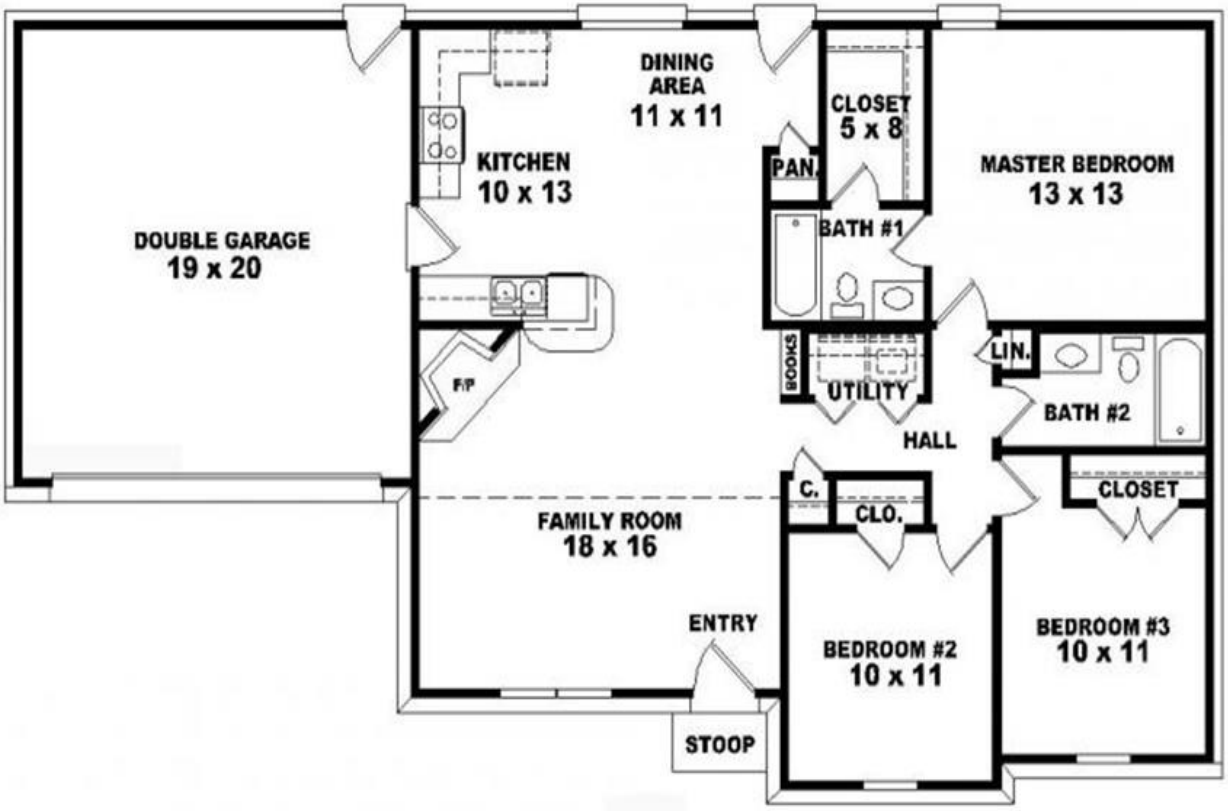
The hazmat team is dispatched to a single-family residence for a deceased victim found in a portable, plastic greenhouse in the first-floor master bedroom. The first arriving units were dispatched for a person's wellness being checked. When the first responders arrived, they found and identified a suicide note with a chemical warning taped to the closed first-floor master bedroom door. The note stated the following: **"Do not enter without proper gear, H2S inside, hazmat entry only, hydrogen sulfide gas suicide."**

The first responders break down the door and immediately see a light haze or fog in the first-floor master bedroom area. They immediately start to feel a burning sensation around the mouth and eyes. They also begin to cough and have difficulty breathing. They notice an unresponsive person lying down in a portable, plastic greenhouse with many mixing containers with an unidentified liquid in them. The first responders immediately leave the area, quickly exit the single-family house, and wait for the hazmat team to arrive.

Exterior Layout of Home



Interior Floor Plan of the Home




Home
Google earth

Activity 5.2 (cont'd)

Center City Resource Inventory

Resource Provider	Resource	Special Information
Center City	**Police Department**	
	Total uniformed staff 124	Normal shift manning:
	1 Chief	day 30, afternoon 30, midnight 22
	2 Assistant Chiefs	
	10 Shift Sergeants	
	8 Detectives	Trained as crime scene evidence techs
	2 Juvenile Officers	
	10 Special Services Units	SWAT, hostage negotiation, explosives
	10 Office and detention (3 holding cells)	
	59 Patrol Officers	
	2 Training Specialists	
	22 Reservists (Peace Officers)	Traffic, parade duty, special events
	Special equipment	30-passenger bus, robot (Bomb Unit) 14-foot boat on trailer, 50-horsepower (hp) motor
	Note: All police officers are state certified, the department is nationally accredited, all cars have automated external defibrillators (AEDs), and several officers are emergency medical technician (EMT) certified.	
	Fire Department	
	Total uniformed staff 111 full time, 32 call members (firefighter 1 certified)	
	1 Chief	
	4 Assistant Chiefs	
	1 Training Captain	
	4 Fire Prevention/Inspection/Investigation Officers	
	Engine 1 — 1,500 gpm, 1,000 gal. tank (staffs 4)	
	Engine 2 — 1,500 gpm, 1,000 gal. tank (staffs 4)	
	Engine 3 — 1,500 gpm, 1,000 gal. tank (staffs 3)	
	Engine 4 — 1,250 gpm, 750 gal. tank (staffs 3)	
	Ladder 1 — 100-foot ladder w/1,500 gpm and 200 gal. tank (staffs 3)	
	Reserve Engine 5 — 1,000 gpm, 500 gal. tank — not staffed	
	Rescue Engine 1 — 1,500 gpm, 1,000 gal. tank (staffs 5) (responds to all calls)	
	Special Services Unit 1 — reserve engine equipped as a Level A Hazmat Unit staffed by Rescue 1 staff when needed (carries 100 gal. aqueous film-forming foam (AFFF))	
	Ambulance 1 — basic life support (BLS) (staffs 2)	
	Reserve Ambulance 2 — not staffed	
	Special equipment	City command bus 14-foot rescue boat w/35-hp motor

Resource Provider	Resource	Special Information
	Note: All full-time firefighters are certified EMTs (various levels), 68 career and 32 call members are certified in hazmat operations, and 42 career are certified at the technician level. All Rescue, Engine and Ladder 1 staff are technicians and receive bonus pay. Engine companies do EMS first response for all life-threatening EMS calls. All members carry pagers for callback duty.	
Center City	**Public Works — total staff 87**	
	Street department, water department, parks department — also operate county sewage treatment plant	Dump trucks, snowplows, sand trucks, loaders, excavation equipment, barricades and dewatering pumps
	Emergency Management/Planning Department — total staff 3	
		Maintain and support City Emergency Operations Center (EOC)
	American Red Cross — full-time staff 3, call staff of 12	
		Operate food services vehicle Negotiate contracts for emergency shelters
	Silver Cross EMS	
		1 advanced life support (ALS) and 1 BLS transport staffed daily
	Mercy Hospital	
		40-bed short-term care emergency room, operating room (minor surgery only), nearest trauma center 45 minutes
North Town	**Police Department — total staff 32 Sworn Officers**	
15-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 4 Sergeants, 1 Juvenile Officer, 25 Patrol Officers	Rehab bus/Command Post (CP) (15 passengers)
	Fire Department — total staff of 22 full time and 20 call members	
	1 Chief, 1 Assistant Chief, 1 Fire Prevention/Investigation/Training Officer Engine 1 — 1,750 gpm, 1,250 gal. tank (staffs 3) Engine 2 — 1,250 gpm, 1,000 gal. tank (staffs 2) Ladder 1 — 100-foot quint 1,500 gpm, 200 gal. tank (staffs 1) Reserve Engine 3 — 1,000 gpm, 1,000 gal. tank — not staffed	

Resource Provider	Resource	Special Information
	EMS provided by Silver Cross	
	Note: All staff hazmat operations trained and have a decontamination trailer.	
South Town	**Police Department — total staff 60 Sworn Officers, 14 Reservist (Peace Officers)**	
20-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 6 Shift Sergeants, 2 Juvenile Officers, 1 Training Officer, 50 Patrol Officers	
	Fire Department — total staff 38 career, 24 volunteer	
	1 Chief, 2 Assistant Chiefs, 1 Training Captain, 2 Fire Prevention/Public Ed, Fire Investigation	
	Engine 1 — 1,500 gpm, 1,000 gal. tank (staffs 4) Engine 2 — 1,500 gpm, 1,000 gal. tank (staffs 4) Ladder 1 — 100-foot articulated boom — no pump/water (staffs 2) Ambulance 1 — ALS level (staffs 2)	
	Note: All career are level 2 firefighters, hazmat technician certified, and EMS trained. Volunteers are mostly level 2 firefighters, hazmat operations, some EMS trained.	
Ridge County	**Public Works — total staff 62**	
	Typical highway department	
	Emergency Management	
30-minute response time for on-duty resources	Maintain and staff County EOC (staffs 15)	Operate County 911 dispatch center
	Health Department — total professional staff 34 including 14 RNs	
	Sheriff's Department — total staff of 67	
	Jail (staffs 24) Office/Booking/Evidence/etc. (staffs 8) Road patrol (staffs 30)	
State	**Police — typically 6 officers in county patrolling and other duties**	
	Can provide 45 officers with 3-hour notice	

Resource Provider	Resource	Special Information
	Highway Department — typically 20 workers in county	
	Can provide 45 workers with 3-hour notice	
	National Guard	
	Engineering Unit in Center City — normal staffing is 100. Today 60 are deployed.	
Other Resources	**Civil Support Team 007**	
	3-hour response time	
	Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)	
	3-hour response time	
	FBI	
	3-hour response time	
	Baldwin Level A Hazmat Team	
	2-hour response time (staffs 8 technicians)	
	Exeter Level B Hazmat/Decontamination	
	2-hour response time (staffs 8 technicians)	
	Private hazmat spill cleanup contractor	
	3- to 4-hour response time	

Activity 5.2 (cont'd)

Size-Up Information Worksheet

Product(s): _____

Container(s): _____

Environment: _____

Other critical factors: _____

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Activity 5.2 (cont'd)

Strategic Goals/Incident Objectives Worksheet

Below are typical strategic goals or items that may become incident objectives. Use this page to write Specific, Measurable, Achievable, Realistic and Timeframed (SMART) incident objectives for each strategic goal you wish to use.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Recovery/Termination:
Other incident objectives/goals:

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Activity 5.2 (cont'd)

Tactical Objectives Worksheet

For each incident objective/strategic goal identified on the Strategic Goals/Incident Objectives Worksheet, list the tactical objective you would use to accomplish that goal. The tactical objectives assigned should be within the scope of duty for the responders who will be assigned to them and within a standard of care.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Termination/Recovery:

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Activity 5.2 (cont'd)

Decontamination and Critical Safety Factors Worksheet

What decontamination measures will you employ before the responders take any action where they may be exposed to the product(s), and what, if any, decontamination measures would you take following the incident?

Critical safety factors for first responders:
Critical safety factors for people within the incident Hot Zone:
Critical safety factors for the public:
Other critical factors:

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Activity 5.2 (cont'd)

Risk Management Worksheet

For each safety issue identified for the incident, as the Incident Commander (IC), what risk management measures would you initiate or have initiated?

Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
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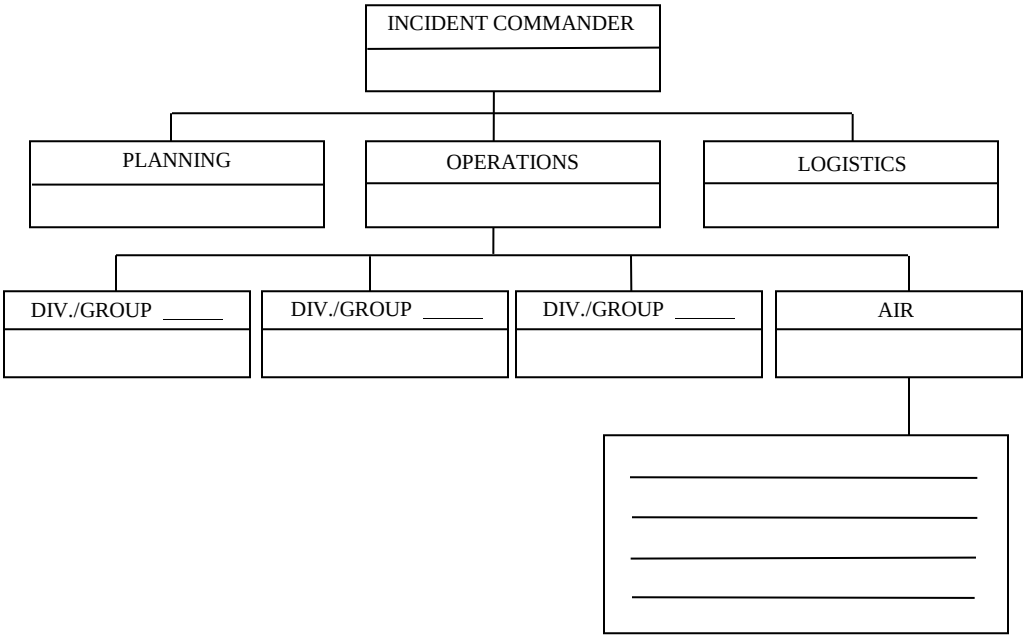
Activity 5.2 (cont'd)

ICS Form 201, Incident Briefing

INCIDENT BRIEFING	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. MAP SKETCH			
ICS 201 (12/93) **NFES 1325**	PAGE 1	5. PREPARED BY (NAME AND POSITION)	

6. SUMMARY OF CURRENT ACTIONS		

7. CURRENT ORGANIZATION



ICS 201 (12/93) **NFES 1325**	PAGE 3	

8. RESOURCES SUMMARY				
RESOURCES ORDERED	**RESOURCES IDENTIFICATION**	**ETA**	**ON SCENE √**	**LOCATION/ASSIGNMENT**
ICS 201 (12/93) NFES 1325	PAGE 4			

Activity 5.2 (cont'd)

ICS Form 202, Incident Objectives

INCIDENT OBJECTIVES	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. OPERATIONAL PERIOD (DATE/TIME)			
5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)			
6. WEATHER FORECAST FOR OPERATIONAL PERIOD			
7. GENERAL SAFETY MESSAGE			
8. ATTACHMENTS (√ IF ATTACHED) ☐ ORGANIZATION LIST (ICS 203) ☐ MEDICAL PLAN (ICS 206) ☐ _____ ☐ ASSIGNMENT LIST (ICS 204) ☐ INCIDENT MAP ☐ _____ ☐ COMMUNICATIONS PLAN (ICS 205) ☐ TRAFFIC PLAN ☐ _____			
202 ICS 3-80	9. PREPARED BY (PLANNING SECTION CHIEF)	10. APPROVED BY (INCIDENT COMMANDER)	

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Activity 5.2 (cont'd)

ICS Form 203, Organization Assignment List

ORGANIZATION ASSIGNMENT LIST		1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
POSITION	NAME	4. OPERATIONAL PERIOD (DATE/TIME)		
5. INCIDENT COMMANDER AND STAFF				
INCIDENT COMMANDER		9. OPERATIONS SECTION		
DEPUTY		CHIEF		
SAFETY OFFICER		DEPUTY		
PUBLIC INFORMATION OFFICER		a. BRANCH I — DIVISION/GROUPS		
LIAISON OFFICER		BRANCH DIRECTOR		
6. AGENCY REPRESENTATIVES		DEPUTY		
AGENCY	NAME	DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		b. BRANCH II — DIVISION/GROUPS		
		BRANCH DIRECTOR		
7. PLANNING SECTION		DEPUTY		
CHIEF		DIVISION/GROUP		
DEPUTY		DIVISION/GROUP		
RESOURCES UNIT		DIVISION/GROUP		
SITUATION UNIT		DIVISION/GROUP		
DOCUMENTATION UNIT		DIVISION/GROUP		
DEMOBILIZATION UNIT		c. BRANCH III — DIVISION/GROUPS		
TECHNICAL SPECIALISTS		BRANCH DIRECTOR		
		DEPUTY		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
8. LOGISTICS SECTION		DIVISION/GROUP		
CHIEF		d. AIR OPERATIONS BRANCH		
DEPUTY		AIR OPERATIONS BR. DIR.		
a. SUPPORT BRANCH		AIR TACTICAL GROUP SUP.		
DIRECTOR		AIR SUPPORT GROUP SUP.		
SUPPLY UNIT		HELICOPTER COORDINATOR		
FACILITIES UNIT		AIR TANKER/FIXED-WING CRD.		
GROUND SUPPORT UNIT		10. FINANCE/ADMINISTRATION SECTION		
b. SERVICE BRANCH		CHIEF		
DIRECTOR		DEPUTY		
		TIME UNIT		
COMMUNICATIONS UNIT		PROCUREMENT UNIT		
MEDICAL UNIT		COMPENSATION/CLAIMS UNIT		
FOOD UNIT		COST UNIT		
203 ICS 1-82		11. PREPARED BY (RESOURCES UNIT)		

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Activity 5.2 (cont'd)

ICS Form 206, Medical Plan

MEDICAL PLAN	1. INCIDENT NAME	2. DATE PREPARED	1. TIME PREPARED	1. OPERATIONAL PERIOD

5. INCIDENT MEDICAL AID STATIONS

MEDICAL AID STATIONS	LOCATION	PARAMEDICS	
		YES	NO

6. TRANSPORTATION

A. AMBULANCE SERVICES

NAME	ADDRESS	PHONE	PARAMEDICS	
			YES	NO

B. INCIDENT AMBULANCES

NAME	LOCATION	PARAMEDICS	
		YES	NO

7. HOSPITALS

NAME	ADDRESS	TRAVEL TIME		PHONE	HELIPAD		BURN CENTER	
		AIR	GRND		YES	NO	YES	NO

8. MEDICAL EMERGENCY PROCEDURES

202 **ICS** 3-80	9. PREPARED BY (MEDICAL UNIT LEADER)	10. REVIEWED BY (SAFETY OFFICER)

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Activity 5.2 (cont'd)

ICS Form 208HM, Site Safety and Control Plan

SITE SAFETY AND CONTROL PLAN ICS 208 HM	1. Incident Name:	2. Date Prepared:	3. Operational Period Time

Section I. Site Information

4. Incident Location:

Section II. Organization

5. Incident Commander:	6. HM Group Supervisor:	7. Tech, Specialist — HM Reference:
8. Safety Officer:	9. Entry Leader:	10. Site Access Control Leader:
11. Asst. Safety Officer — HM:	12. Decontamination Leader:	13. Safe Refuge Area Mgr.
14. Environmental Health:	15.	16.

17. Entry Team: (Buddy System) Name:	PPE Level	18. Decontamination Element: Name:	PPE Level
Entry 1		Decon 1	
Entry 2		Decon 2	
Entry 3		Decon 3	
Entry 4		Decon 4	

Section III. Hazard/Risk Analysis

19. Material:	Container type	Qty.	Phys. State	pH	IDLH	F.P.	I.T.	V.P.	V.D.	S.G.	LEL	UEL

Comment:

Section IV. Hazard Monitoring

20. LEL Instrument(s):	21. O_2 Instrument(s):
22. Toxicity/PPM Instrument(s):	23. Radiological Instrument(s):

Comment:

Section V. Decontamination Procedures

24. Standard Decontamination Procedures:	YES:	NO:

Comment:

Section VI. Site Communications

25. Command Frequency:	26. Tactical Frequency:	27. Entry Frequency:

Section VII. Medical Assistance

28. Medical Monitoring:	YES:	NO:	29. Medical Treatment and Transport In-Place:	YES:	NO:

Comment:

ICS 208 HM **Page 1** **3/98**

Section VIII. Site Map

30. Site Map:



Weather ☐ Command Post ☐ Zones ☐ Assembly Areas ☐ Escape Routes ☐ Other ☐

Section IX. Entry Objectives

31. Entry Objectives:

Section X. SOPs and Safe Work Practices

32. Modifications to Documented SOPs or Work Practices:	YES:	NO:

Comment:

Section XI. Emergency Procedures

33. Emergency Procedures:

Section XII. Safety Briefing

34. Asst. Safety Officer — HM Signature:	Safety Briefing Completed (Time):
35. HM Group Supervisor Signature:	36. Incident Commander Signature:

Activity 5.3

Suicide Bombings

Purpose

To apply the appropriate strategic goals of an incident involving a simulated suicide bombing, and determine appropriate tactical objectives. The response will primarily involve first responders trained to the operations level.

Directions

1. Review the material provided for the suicide bombings incident.

2. Review resources for your city (Center City) as well as neighboring communities.

3. Complete the following assignments in your small groups:

    a. Determine critical size-up factors. Complete Size-Up Information Worksheet.

    b. Determine which hazmat strategic goals are to be used. Complete Strategic Goals/Incident Objectives Worksheet.

    c. Determine what tactical objectives would be appropriate to meet the selected strategic goals. Complete Tactical Objectives Worksheet.

    d. Determine what decontamination measures are appropriate. Complete Decontamination and Critical Safety Factors Worksheet.

    e. Evaluate critical safety issues that are present and determine what risk management measures you will implement. Complete Risk Management Worksheet.

    f. Complete ICS Form 201, ICS Form 202, ICS Form 203, ICS Form 206 and ICS Form 208HM as directed by instructors.

4. Diagram your incident management structure on an easel pad.

5. Select a representative to explain how you managed this incident.

Scenario

It is 8:15 a.m. on a cold, winter day. There are 4 inches of snow on the ground from an overnight snow shower. The city's rail system is busy as usual for a weekday rush hour. The trains are crowded with people dressed in many layers of clothing. The floors of the trains are slippery from the snow and slush. The passengers' sense of urgency is apparent as people rush from platforms to trains and up escalators to exit the stations.

The redline train heading toward Franklin stops at Wollaston. Two clowns are among the other passengers waiting on the platform for the train. They board the front car of the train right behind the conductor. Each clown is carrying a basket of large colorful water balloons. They are dressed in goofy costumes with large hats and peculiar looking masks.

The train pulls away from the station. The car with the clowns is full — all the seats are taken and there is little standing room available. At the next stop, a few more people squeeze onto the train. As the train pulls away from Oak Park and enters a dark tunnel, one of the clowns pulls out an explosive device and shouts at the passengers. He criticizes the government, the hypocrisy it stands for, and the unfair treatment of people who speak out against it.

The other clown then fires a gun at the back of the conductor's head; glass shatters from the window that separates the conductor from the passengers. A young man sitting near the clown jumps up and attempts to disarm him. The clown fires the gun again. The young man clutches his chest and falls to the floor. The clown is extremely angry and shouts, "Now he's done it."

Both clowns each take a large hatpin from their hats and puncture the balloons. Some of the people nearest the balloons begin coughing and rubbing their eyes. One elderly woman begins to have great difficulty breathing. Another passenger loses consciousness and a third passenger begins to have seizures. The passengers are becoming hysterical.

The train now pulls into Andrew Station. The first clown detonates the bomb. The train receives major damage to many cars and derails from the track. The subway tunnel and platform are now structurally unsound and compromised. People with many different types of injuries begin to shove their way up and out of the subway station to safety, and mass hysteria erupts.










MATTAPAN


Train Station
Google earth

Activity 5.3 (cont'd)

Center City Resource Inventory

Resource Provider	Resource	Special Information
Center City	**Police Department**	
	Total uniformed staff 124	Normal shift manning:
	1 Chief	day 30, afternoon 30, midnight 22
	2 Assistant Chiefs	
	10 Shift Sergeants	
	8 Detectives	Trained as crime scene evidence techs
	2 Juvenile Officers	
	10 Special Services Units	SWAT, hostage negotiation, explosives
	10 Office and detention (3 holding cells)	
	59 Patrol Officers	
	2 Training Specialists	
	22 Reservists (Peace Officers)	Traffic, parade duty, special events
	Special equipment	30-passenger bus, robot (Bomb Unit) 14-foot boat on trailer, 50-horsepower (hp) motor
	Note: All police officers are state certified, the department is nationally accredited, all cars have AEDs, and several officers are EMT certified.	
	Fire Department	
	Total uniformed staff 111 full time, 32 call members (firefighter 1 certified)	
	1 Chief	
	4 Assistant Chiefs	
	1 Training Captain	
	4 Fire Prevention/Inspection/Investigation Officers	
	Engine 1 — 1,500 gpm, 1,000 gal. tank (staffs 4)	
	Engine 2 — 1,500 gpm, 1,000 gal. tank (staffs 4)	
	Engine 3 — 1,500 gpm, 1,000 gal. tank (staffs 3)	
	Engine 4 — 1,250 gpm, 750 gal. tank (staffs 3)	
	Ladder 1 — 100-foot ladder w/1,500 gpm and 200 gal. tank (staffs 3)	
	Reserve Engine 5 — 1,000 gpm, 500 gal. tank — not staffed	
	Rescue Engine 1 — 1,500 gpm, 1,000 gal. tank (staffs 5) (responds to all calls)	
	Special Services Unit 1 — reserve engine equipped as a Level A Hazmat Unit staffed by Rescue 1 staff when needed (carries 100 gal. AFFF)	
	Ambulance 1 — BLS (staffs 2)	
	Reserve Ambulance 2 — not staffed	
	Special equipment	City command bus 14-foot rescue boat w/35-hp motor

Resource Provider	Resource	Special Information
	Note: All full-time firefighters are certified EMTs (various levels), 68 career and 32 call members are certified in hazmat operations, and 42 career are certified at the technician level. All Rescue, Engine and Ladder 1 staff are technicians and receive bonus pay. Engine companies do EMS first response for all life-threatening EMS calls. All members carry pagers for callback duty.	
Center City	**Public Works — total staff 87**	
	Street department, water department, parks department — also operate county sewage treatment plant	Dump trucks, snowplows, sand trucks, loaders, excavation equipment, barricades and dewatering pumps
	Emergency Management/Planning Department — total staff 3	
		Maintain and support City EOC
	American Red Cross — full-time staff 3, call staff of 12	
		Operate food services vehicle Negotiate contracts for emergency shelters
	Silver Cross EMS	
		1 ALS and 1 BLS transport staffed daily
	Mercy Hospital	
		40-bed short-term care emergency room, operating room (minor surgery only), nearest trauma center 45 minutes
North Town	**Police Department — total staff 32 Sworn Officers**	
15-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 4 Sergeants, 1 Juvenile Officer, 25 Patrol Officers	Rehab bus/CP (15 passengers)
	Fire Department — total staff of 22 full time and 20 call members	
	1 Chief, 1 Assistant Chief, 1 Fire Prevention/Investigation/Training Officer Engine 1 — 1,750 gpm, 1,250 gal. tank (staffs 3) Engine 2 — 1,250 gpm, 1,000 gal. tank (staffs 2) Ladder 1 — 100-foot quint 1,500 gpm, 200 gal. tank (staffs 1) Reserve Engine 3 — 1,000 gpm, 1,000 gal. tank — not staffed	

Resource Provider	Resource	Special Information
	EMS provided by Silver Cross	
	Note: All staff hazmat operations trained and have a decontamination trailer.	
South Town	**Police Department — total staff 60 Sworn Officers, 14 Reservist (Peace Officers)**	
20-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 6 Shift Sergeants, 2 Juvenile Officers, 1 Training Officer, 50 Patrol Officers	
	Fire Department — total staff 38 career, 24 volunteer	
	1 Chief, 2 Assistant Chiefs, 1 Training Captain, 2 Fire Prevention/Public Ed, Fire Investigation	
	Engine 1 — 1,500 gpm, 1,000 gal. tank (staffs 4) Engine 2 — 1,500 gpm, 1,000 gal. tank (staffs 4) Ladder 1 — 100-foot articulated boom — no pump/water (staffs 2) Ambulance 1 — ALS level (staffs 2)	
	Note: All career are level 2 firefighters, hazmat technician certified, and EMS trained. Volunteers are mostly level 2 firefighters, hazmat operations, some EMS trained.	
Ridge County	**Public Works — total staff 62**	
	Typical highway department	
	Emergency Management	
30-minute response time for on-duty resources	Maintain and staff County EOC (staffs 15)	Operate County 911 dispatch center
	Health Department — total professional staff 34 including 14 RNs	
	Sheriff's Department — total staff of 67	
	Jail (staffs 24) Office/Booking/Evidence/etc. (staffs 8) Road patrol (staffs 30)	
State	**Police — typically 6 officers in county patrolling and other duties**	
	Can provide 45 officers with 3-hour notice	

Resource Provider	Resource	Special Information
	Highway Department — typically 20 workers in county	
	Can provide 45 workers with 3-hour notice	
	National Guard	
	Engineering Unit in Center City — normal staffing is 100. Today 60 are deployed.	
Other Resources	**Civil Support Team 007**	
	3-hour response time	
	ATF	
	3-hour response time	
	FBI	
	3-hour response time	
	Baldwin Level A Hazmat Team	
	2-hour response time (staffs 8 technicians)	
	Exeter Level B Hazmat/Decontamination	
	2-hour response time (staffs 8 technicians)	
	Private hazmat spill cleanup contractor	
	3- to 4-hour response time	

Activity 5.3 (cont'd)

Size-Up Information Worksheet

Product(s): _____

Container(s): _____

Environment: _____

Other critical factors: _____

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Activity 5.3 (cont'd)

Strategic Goals/Incident Objectives Worksheet

Below are typical strategic goals or items that may become incident objectives. Use this page to write SMART incident objectives for each strategic goal you wish to use.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Recovery/Termination:
Other incident objectives/goals:

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Activity 5.3 (cont'd)

Tactical Objectives Worksheet

For each incident objective/strategic goal identified on the Strategic Goals/Incident Objectives Worksheet, list the tactical objective you would use to accomplish that goal. The tactical objectives assigned should be within the scope of duty for the responders who will be assigned to them and within a standard of care.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Termination/Recovery:

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Activity 5.3 (cont'd)

Decontamination and Critical Safety Factors Worksheet

What decontamination measures will you employ before the responders take any action where they may be exposed to the product(s), and what, if any, decontamination measures would you take following the incident?

Critical safety factors for first responders:
Critical safety factors for people within the incident Hot Zone:
Critical safety factors for the public:
Other critical factors:

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Activity 5.3 (cont'd)

Risk Management Worksheet

For each safety issue identified for the incident, as the IC, what risk management measures would you initiate or have initiated?

Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:

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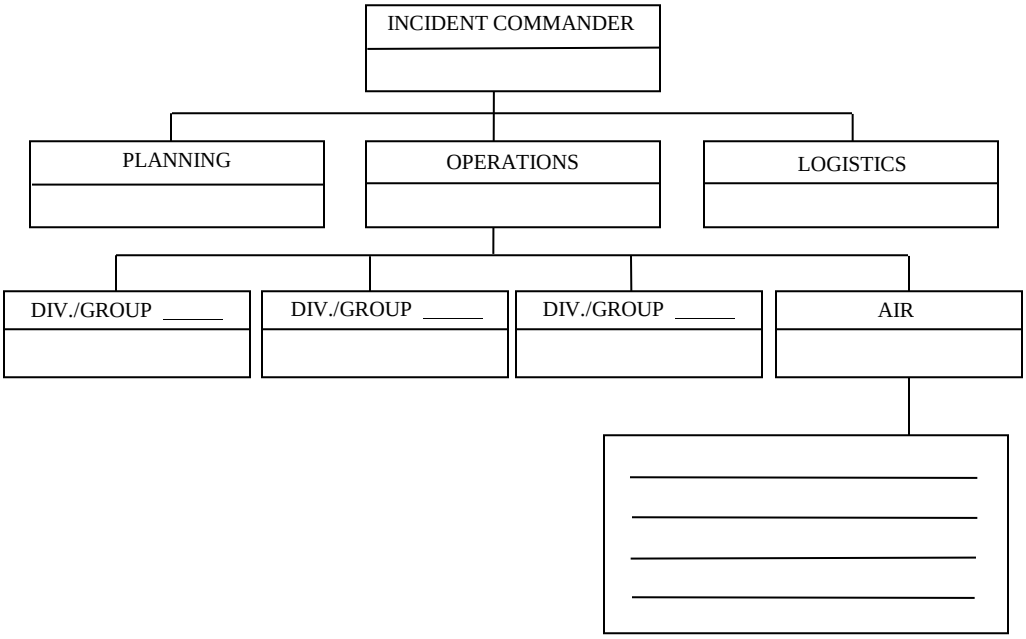
Activity 5.3 (cont'd)

ICS Form 201, Incident Briefing

INCIDENT BRIEFING	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. MAP SKETCH			
ICS 201 (12/93) **NFES 1325**	PAGE 1	5. PREPARED BY (NAME AND POSITION)	

6. SUMMARY OF CURRENT ACTIONS		

7. CURRENT ORGANIZATION



ICS 201 (12/93) **NFES 1325**	PAGE 3	

8. RESOURCES SUMMARY				
RESOURCES ORDERED	**RESOURCES IDENTIFICATION**	**ETA**	**ON SCENE √**	**LOCATION/ASSIGNMENT**
ICS 201 (12/93) NFES 1325	PAGE 4			

Activity 5.3 (cont'd)

ICS Form 202, Incident Objectives

INCIDENT OBJECTIVES	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. OPERATIONAL PERIOD (DATE/TIME)			
5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)			
6. WEATHER FORECAST FOR OPERATIONAL PERIOD			
7. GENERAL SAFETY MESSAGE			
8. ATTACHMENTS (√ IF ATTACHED) ☐ ORGANIZATION LIST (ICS 203) ☐ MEDICAL PLAN (ICS 206) ☐ _____ ☐ ASSIGNMENT LIST (ICS 204) ☐ INCIDENT MAP ☐ _____ ☐ COMMUNICATIONS PLAN (ICS 205) ☐ TRAFFIC PLAN ☐ _____			
202 ICS 3-80	9. PREPARED BY (PLANNING SECTION CHIEF)	10. APPROVED BY (INCIDENT COMMANDER)	

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Activity 5.3 (cont'd)

ICS Form 203, Organization Assignment List

ORGANIZATION ASSIGNMENT LIST		1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
POSITION	NAME	4. OPERATIONAL PERIOD (DATE/TIME)		
5. INCIDENT COMMANDER AND STAFF				
INCIDENT COMMANDER		9. OPERATIONS SECTION		
DEPUTY		CHIEF		
SAFETY OFFICER		DEPUTY		
PUBLIC INFORMATION OFFICER		a. BRANCH I — DIVISION/GROUPS		
LIAISON OFFICER		BRANCH DIRECTOR		
6. AGENCY REPRESENTATIVES		DEPUTY		
AGENCY	NAME	DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		b. BRANCH II — DIVISION/GROUPS		
		BRANCH DIRECTOR		
7. PLANNING SECTION		DEPUTY		
CHIEF		DIVISION/GROUP		
DEPUTY		DIVISION/GROUP		
RESOURCES UNIT		DIVISION/GROUP		
SITUATION UNIT		DIVISION/GROUP		
DOCUMENTATION UNIT		DIVISION/GROUP		
DEMOBILIZATION UNIT		c. BRANCH III — DIVISION/GROUPS		
TECHNICAL SPECIALISTS		BRANCH DIRECTOR		
		DEPUTY		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
8. LOGISTICS SECTION		DIVISION/GROUP		
CHIEF		d. AIR OPERATIONS BRANCH		
DEPUTY		AIR OPERATIONS BR. DIR.		
a. SUPPORT BRANCH		AIR TACTICAL GROUP SUP.		
DIRECTOR		AIR SUPPORT GROUP SUP.		
SUPPLY UNIT		HELICOPTER COORDINATOR		
FACILITIES UNIT		AIR TANKER/FIXED-WING CRD.		
GROUND SUPPORT UNIT		10. FINANCE/ADMINISTRATION SECTION		
b. SERVICE BRANCH		CHIEF		
DIRECTOR		DEPUTY		
		TIME UNIT		
COMMUNICATIONS UNIT		PROCUREMENT UNIT		
MEDICAL UNIT		COMPENSATION/CLAIMS UNIT		
FOOD UNIT		COST UNIT		
203 ICS 1-82		11. PREPARED BY (RESOURCES UNIT)		

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Activity 5.3 (cont'd)

ICS Form 206, Medical Plan

MEDICAL PLAN	1. INCIDENT NAME	2. DATE PREPARED	1. TIME PREPARED	1. OPERATIONAL PERIOD

5. INCIDENT MEDICAL AID STATIONS

MEDICAL AID STATIONS	LOCATION	PARAMEDICS	
		YES	NO

6. TRANSPORTATION

A. AMBULANCE SERVICES

NAME	ADDRESS	PHONE	PARAMEDICS	
			YES	NO

B. INCIDENT AMBULANCES

NAME	LOCATION	PARAMEDICS	
		YES	NO

7. HOSPITALS

NAME	ADDRESS	TRAVEL TIME		PHONE	HELIPAD		BURN CENTER	
		AIR	GRND		YES	NO	YES	NO

8. MEDICAL EMERGENCY PROCEDURES

202 **ICS** 3-80	9. PREPARED BY (MEDICAL UNIT LEADER)	10. REVIEWED BY (SAFETY OFFICER)

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Activity 5.3 (cont'd)

ICS Form 208HM, Site Safety and Control Plan

SITE SAFETY AND CONTROL PLAN ICS 208 HM	1. Incident Name:	2. Date Prepared:	3. Operational Period Time

Section I. Site Information

4. Incident Location:

Section II. Organization

5. Incident Commander:	6. HM Group Supervisor:	7. Tech, Specialist — HM Reference:
8. Safety Officer:	9. Entry Leader:	10. Site Access Control Leader:
11. Asst. Safety Officer — HM:	12. Decontamination Leader:	13. Safe Refuge Area Mgr.
14. Environmental Health:	15.	16.

17. Entry Team: (Buddy System) Name:	PPE Level	18. Decontamination Element: Name:	PPE Level
Entry 1		Decon 1	
Entry 2		Decon 2	
Entry 3		Decon 3	
Entry 4		Decon 4	

Section III. Hazard/Risk Analysis

19. Material:	Container type	Qty.	Phys. State	pH	IDLH	F.P.	I.T.	V.P.	V.D.	S.G.	LEL	UEL

Comment:

Section IV. Hazard Monitoring

20. LEL Instrument(s):	21. O_2 Instrument(s):
22. Toxicity/PPM Instrument(s):	23. Radiological Instrument(s):

Comment:

Section V. Decontamination Procedures

24. Standard Decontamination Procedures:	YES:	NO:

Comment:

Section VI. Site Communications

25. Command Frequency:	26. Tactical Frequency:	27. Entry Frequency:

Section VII. Medical Assistance

28. Medical Monitoring:	YES:	NO:	29. Medical Treatment and Transport In-Place:	YES:	NO:

Comment:

ICS 208 HM **Page 1** **3/98**

Section VIII. Site Map

30. Site Map:



Weather ☐ Command Post ☐ Zones ☐ Assembly Areas ☐ Escape Routes ☐ Other ☐

Section IX. Entry Objectives

31. Entry Objectives:

Section X. SOPs and Safe Work Practices

32. Modifications to Documented SOPs or Work Practices:	YES:	NO:

Comment:

Section XI. Emergency Procedures

33. Emergency Procedures:

Section XII. Safety Briefing

34. Asst. Safety Officer — HM Signature:	Safety Briefing Completed (Time):
35. HM Group Supervisor Signature:	36. Incident Commander Signature:

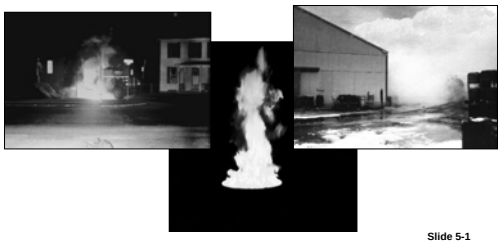
NOTE-TAKING GUIDE

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NOTE-TAKING GUIDE

Slide 5-1

HAZARDOUS MATERIALS INCIDENT MANAGEMENT



Slide 5-1

Slide 5-2

UNIT 5: HAZMAT SPECIAL INCIDENT CONSIDERATIONS

Slide 5-2

Slide 5-3

TERMINAL OBJECTIVE

The students will be able to identify emerging hazardous materials/ weapons of mass destruction (WMD) issues and effectively develop appropriate incident actions for hazmat/WMD special operations incidents.

Slide 5-3

Slide 5-4

ENABLING OBJECTIVES

The students will:

- **Describe at least three operational considerations to address multidisciplinary, clandestine, meth drug lab operations at a hazmat/WMD incident.**
- **Describe at least three operational considerations to address multidisciplinary, crime-scene operations at a hazmat/WMD incident.**

Slide 5-4

Slide 5-5

ENABLING OBJECTIVES (cont'd)

- **Describe at least three operational considerations to address multidisciplinary, white powder/unknown packages operations at a hazmat/WMD incident.**
- **Describe at least three operational considerations to address multidisciplinary, chemical assisted/detergent suicide operations at a hazmat/WMD incident.**

Slide 5-5

Slide 5-6

ENABLING OBJECTIVES (cont'd)

- **Describe at least three operational considerations to address multidisciplinary, suicide bombings/mass fatalities operations at a hazmat/WMD incident.**

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Slide 5-7

CLANDESTINE METH DRUG LABS

Slide 5-7

Slide 5-8

HOUSEHOLD MATERIALS USED TO PRODUCE METH

- **Pseudoephedrine**
- **Aluminum foil**
- **Paint thinner**
- **Lithium camera batteries**
- **Mineral spirits**
- **Charcoal lighter fluid**
- **Anhydrous ammonia**
- **Denatured alcohol**
- **Matchbooks and matchbook striker plates**
- **Rock**

Slide 5-8

Slide 5-9

HOUSEHOLD MATERIALS USED TO PRODUCE METH (cont'd)

- **Table or Epsom salt**
- **Camp fuel**
- **Gas line antifreeze (methanol)**
- **Muriatic acid**
- **Tincture of iodine**
- **Sulfuric acid**
- **Lye (sodium hydroxide)**
- **Ammonium nitrate**
- **Dry ice**
- **Acetone**
- **Coffee filters**
- **Cheesecloth or napkins (to separate liquids from solids)**
- **Pots**
- **Pans**
- **Stoves or pressure cookers (cooking)**

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Slide 5-10

HOUSEHOLD MATERIALS USED TO PRODUCE METH (cont'd)

- Iced-tea jars, sports jars or glassware (to separate layers of liquids)
- Blenders
- Ice chests
- Liquefied petroleum gas (LPG) cylinders
- Coolers
- Turkey basters
- Identified or unidentified chemical containers

Slide 5-10

Slide 5-11

INCIDENT RESPONSES THAT CAN IDENTIFY CLANDESTINE METH DRUG LABS

- Medical aid calls with burn or smoke-inhalation victims
- "Person-down" calls
- Structure fires and rubbish fires, perhaps accompanied by explosions or "loud booms"
- Investigation calls (smoke investigations, odor complaints, illegal dumping and sick buildings)

Slide 5-11

Slide 5-12

CLANDESTINE METH DRUG LABS CLUES AND INDICATORS

- Large amount of cold tablet punch/blister packs that list ephedrine or pseudoephedrine as their primary medicinal ingredient.
- Jars containing clear liquid with a white- or red-colored solid on the bottom.
- Jars labeled as containing iodine or that contain dark, shiny, metallic, purple crystals.

Slide 5-12

Slide 5-13

CLANDESTINE METH DRUG LABS CLUES AND INDICATORS (cont'd)

- **Jars labeled as containing red phosphorus or that contain a fine, dark red or purple powder.**
- **Coffee filters containing a white pasty substance, a dark red sludge, or small amounts of shiny white crystals.**
- **Bottles labeled as containing sulfuric, muriatic or hydrochloric acid.**

Slide 5-13

Slide 5-14

CLANDESTINE METH DRUG LABS CLUES AND INDICATORS (cont'd)

- **Bottles or jars with rubber tubing attached.**
- **Glass cookware or frying pans containing a powdery residue.**
- **An unusually large number of cans of camp fuel, paint thinner, acetone, lye, and drain cleaners containing sulfuric acid or bottles containing muriatic acid.**

Slide 5-14

Slide 5-15

CLANDESTINE METH DRUG LABS CLUES AND INDICATORS (cont'd)

- **Large numbers of lithium batteries, especially if they have been stripped.**
- **Soft silver or gray metallic ribbon (in chunk form) stored in oil or kerosene.**
- **Propane tanks with fittings that have turned blue.**

Slide 5-15

Slide 5-16

CLANDESTINE METH DRUG LABS CLUES AND INDICATORS (cont'd)

- **Occupants of the residence outside smoking.**
- **A strong smell of urine or unusual chemical smells such as ether, ammonia or acetone.**

Slide 5-16

Slide 5-17

EXTERIOR STRUCTURAL CLUES FOR CLANDESTINE METH DRUG LABS

- **Covered (plastic) or painted windows**
- **Chemical odors**
- **Homemade bars on doors or windows**
- **Chemical containers and glassware (indoors or outdoors)**
- **Stains on walls and ceilings**
- **Corrosion of metal surfaces**

Slide 5-17

Slide 5-18

EXTERIOR STRUCTURAL CLUES FOR CLANDESTINE METH DRUG LABS (cont'd)

- **Unusual pipes or ducts coming from windows or walls**
- **Fans in inappropriate places**
- **Portable generators for outdoor sites**
- **Propane tanks or other types of pressurized containers with unusual valves or attachments**
- **Objects or people who seem out of place for the location or time of the incident**

Slide 5-18

Slide 5-19

MAJOR RESPONSE HAZARDS FROM CLANDESTINE METH DRUG LABS

- **A flammable or an explosive atmosphere**
- **An oxygen-deficient or toxic atmosphere**
- **Leaking or damaged compressed gas cylinders**
- **Clan labs in confined spaces**
- **Water-reactive and pyrophoric chemicals**

Slide 5-19

Slide 5-20

MAJOR RESPONSE HAZARDS FROM CLANDESTINE METH DRUG LABS (cont'd)

- **Electrical hazards and sources of ignition**
- **Reactions in progress, which can include containers under high heat and high pressure**
- **Incompatible chemical reactions**
- **Bombs and booby traps**

Slide 5-20

Slide 5-21

THREE MAIN TYPES OF HARM FOR CLANDESTINE METH DRUG LABS

- **Physical injury from explosions, fires, chemical burns and toxic fumes**
- **Environmental hazards**
- **Child/Resident endangerment**

Slide 5-21

Slide 5-22

CLANDESTINE METH DRUG LABS EMERGENCY RESPONSE GUIDELINES

- **Establish Unified Command Law enforcement; Drug Enforcement Administration (DEA); Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) may be lead agency**
- **Water and chemical runoff issues**
- **Vapor control issues**

Slide 5-22

Slide 5-23

CLANDESTINE METH DRUG LABS EMERGENCY RESPONSE GUIDELINES (cont'd)

- **Fire control**
  – If the initial fire attack is in progress when the location is identified as a clandestine meth drug lab, withdraw the attack teams and shift from an offensive to a defensive operation.

Slide 5-23

Slide 5-24

CLANDESTINE METH DRUG LABS EMERGENCY RESPONSE GUIDELINES (cont'd)

- **Evacuate all structures surrounding the incident**
- **Hazmat control zones**
- **Overhaul and crime-scene preservation**
- **Responder and victim decontamination**
- **Constant situational awareness and scene size-up**

Slide 5-24

Slide 5-25

CLANDESTINE METH DRUG LABS EMERGENCY RESPONSE GUIDELINES (cont'd)

- **Emergency responder interactions with potential suspects and victims**
- **Appropriate authority and resource notification (i.e., hazmat, law enforcement, local, regional, state, etc.)**

Slide 5-25

Slide 5-26

WHITE POWDER AND SUSPICIOUS PACKAGE SCREENING

Slide 5-26

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SUSPICIOUS PACKAGES

- **Response is guided by protocols from the Federal Bureau of Investigation (FBI), Centers for Disease Control and Prevention (CDC), and the National Domestic Preparedness Office (NDPO).**
- **Includes:**
  – Suspicious packages, powders and letters.
  – Explosive devices that may have spread hazardous substances.

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DISPERSION DEVICES

Can be used to disseminate:

- **Microorganisms**
- **Biological toxins**
- **Chemicals**
- **Radiation**
- **Powders**

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DETERMINING CREDIBILITY

- **Circumstances of the situation**
- **Information provided by callers and witnesses**
- **Location**
- **Occupancy**
- **Biological indicators**

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SCREENING PRIORITIES

- **Bombs and explosives first**
- **Radiation**
- **Powders and liquids**
  - **Written threats**
  - **Signs and symptoms of those exposed**
  - **Odors**

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MULTIDISCIPLINE AND CRIME-SCENE OPERATIONS



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MULTIDISCIPLINE AND CRIME-SCENE OPERATIONS (cont'd)

- **All require coordination, cooperation and communication**
- **May involve transitioning command and primary responsibility from one agency to another**
- **Often influenced by agency statutory requirements**

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CRIME-SCENE OPERATIONS

- **Requires Unified Command from initial stages.**
- **Operations must protect lives and property but also identify and protect evidence.**

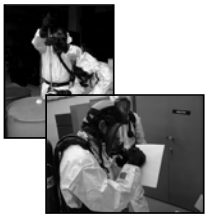


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CRIME SCENE OPERATIONS (cont'd)

- **Incident may start or make a transition to law enforcement Incident Command.**
- **Requires coordination and communication.**



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CRIME-SCENE OPERATIONS (cont'd)

- **Nonlaw enforcement personnel must recognize, protect and possibly mark locations of evidence.**
- **Evidence must not be collected by fire personnel unless absolutely essential.**



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TYPES OF CRIME-SCENE OPERATIONS

- **Environmental crimes**
- **Clandestine labs (drug, chemical, biological, etc.)**
- **Hostage/Barricade situations**
- **Hazmat/WMD incidents**



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LEGAL ISSUES

- **Emergency responder becomes part of the WMD crime scene.**
- **Emergency responder's actions become potential evidence.**
- **Emergency responder may be called to testify in court.**



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LEGAL ISSUES (cont'd)

All emergency responders have a stake in recognizing, identifying and preserving (RIP) the potential evidence at a WMD crime scene.



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RESPONDERS' RESPONSIBILITIES

- **Recognize**
  - **See it as potential evidence**
- **Identify**
  - **Mark it as potential evidence**
- **Preserve**
  - **Protect it for future evidence**

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THREE TYPES OF EVIDENCE

- **Physical**
- **Testimonial**
- **Documentary**



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PHYSICAL EVIDENCE

Evidence that plays a direct part in the incident in question. Evidence that one actually can inspect.



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TESTIMONIAL EVIDENCE

A person's testimony offered to prove the truth of the matter asserted



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TESTIMONIAL EVIDENCE (cont'd)

Witness attributes:

- **Capacity to observe**
- **Recollection**
- **Communication**
- **Appreciation of the obligation to speak truthfully**

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DOCUMENTARY EVIDENCE

Evidence supplied by writing or other documentation, which must be authenticated before the evidence is admissible





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DOCUMENTARY EVIDENCE (cont'd)

- **Written documents**
- **Photographs/Sketches**
- **Electronic data recordings**



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DISCOVERY

- **Pretrial procedure**
- **Disclosure of that which was previously unknown**
- **One party gains information held by the other party regarding the case**
- **Reports, pictures, electronic data recordings, witnesses**

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Activity 5.1
Crime-Scene Management

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CRIME SCENE VIDEO 1

- **View the video**
- **Note any actions that may disturb or destroy evidence**
- **Discuss your findings in the debriefing**

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VIDEO 1



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CRIME SCENE VIDEO 2

- **View the video**
- **Note any actions that the responders took to recognize, identify and preserve evidence**
- **Discuss your findings in the debriefing**

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VIDEO 2



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CHEMICAL/DETERGENT ASSISTED SUICIDES

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NATURE OF RESPONSE/ EMERGING THREAT

- **These situations are commonly occurring in:**
  - **Vehicles**
  - **Closets**
  - **Laundry rooms**
  - **Residential bathrooms**
  - **Bedrooms**
  - **Other enclosed areas**

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NATURE OF RESPONSE/ EMERGING THREAT (cont'd)

Engineering method (involves mixing common household chemicals to create):

- **Hydrogen sulfide**
- **Hydrogen cyanide**
- **Chlorine**
- **Other gases that can be "immediately dangerous to life and health (IDLH)" if inhaled or injested in small, enclosed locations**

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PHYSICAL CHARACTERISTICS OF CHEMICAL/DETERGENT SUICIDES

- **Both hydrogen sulfide and hydrogen cyanide are flammable materials.**
- **Concentrations may not typically reach the lower explosive limit (LEL) except at close proximity to the mixing containers.**
- **Responders should eliminate ignition sources whenever possible.**

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PHYSICAL CHARACTERISTICS OF CHEMICAL/DETERGENT SUICIDES (cont'd)

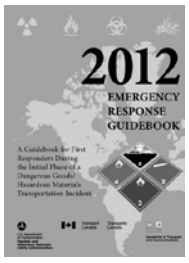
- **There have been no incidents of fire reported with these incidents at this time.**
- **The chemical reaction may restart if the mixing container is moved.**

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RESPONDER SAFETY

- **U.S. Department of Transportation (DOT) Response Guidebook 111 (Mixed Load/ Unidentified Cargo)**



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RESPONDER SAFETY (cont'd)

- **People committing this act may or may not leave a hazardous warning sign displayed to anyone approaching the scene.**
- **Suicide note may or may not be visible or posted.**



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RESPONDER SAFETY (cont'd)

When approaching the vehicle or enclosed space, look for the following key size-up indicators:

- **Subject appears unconscious and unresponsive**
- **Tape or plastic over vents and windows**

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RESPONDER SAFETY (cont'd)

- **Buckets, pails, pots or coolers in the vehicle or enclosed space containing a variety of chemicals**
- **Empty containers of chemicals in or around a vehicle or enclosed space**

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RESPONDER SAFETY (cont'd)

- **Smell of rotten eggs or unusual odors, indicating the presence of hydrogen sulfide**
- **Smell of bitter or burnt almonds, indicating the presence of hydrogen cyanide**
- **Yellow-green or white residue on a vehicle's seats or dashboard — this residue has been found in almost all chemical suicide cases**

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RESPONDER SAFETY (cont'd)

- **Windows fogged or tinted with yellow-green residue**
- **Pennies in the vehicle or vehicle console area will be tarnished with residue**
- **Vehicle's inside door handles removed, which prevents a subject who has changed his or her mind from stopping the suicide process**

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SCENE APPROACH

Full firefighter turnout gear with a positive-pressure self-contained breathing apparatus (PP-SCBA) used for initial approach and/or rescue based on scene size-up indicators.



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SCENE APPROACH (cont'd)

- **The incident should be considered a crime scene and should be treated as such.**
- **Survey the interior and exterior of the vehicle and enclosed space.**

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SCENE APPROACH (cont'd)

Determine responsiveness of patient:

- **Conscious or unconscious**
- **Attempt to wake victim by public-address system or bullhorn**
- **Use binoculars for reconnaissance**
- **Is patient breathing — chest rise and fall**

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SCENE APPROACH (cont'd)

- **If patient is conscious, can he or she open the vehicle door or exit the enclosed space by walking or crawling.**
- **Be careful when treating patient due to the "off gassing" from the victims clothing and exhaled breaths.**

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EVACUATION CONSIDERATIONS

- **Consider wind direction and speed.**
- **In a dorm room or apartment building, consideration should be given to evacuating the entire floor or building based on scene conditions.**
- **Positive-pressure ventilation (PPV) can be used to reduce vapors in a vehicle or structure.**

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AIR MONITORING

- **Air monitoring and detection can be used to determine the presence or absence of hydrogen sulfide, hydrogen cyanide, chlorine gas or other materials.**
- **A small hole may be punched:**
  – In a vehicle.
  – Structure window.
  – A probe or colorimetric tube inserted in the gap between a door to the room and the floor.

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FIELD DECONTAMINATION

- **Responders must initially use emergency decontamination for rescue operations.**
- **The victim should be stripped and decontaminated with soap and water before transport.**
- **Deceased victims should be covered by a sheet and will require decontamination.**

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FIELD DECONTAMINATION (cont'd)

- **Clothing must be removed and double-bagged**
- **Responders and personal protective equipment (PPE) must be decontaminated**
- **Responders must take personal showers**
- **Responders must be medically monitored**

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Activity 5.2 Chemical/Detergent Assisted Suicides

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EXTERIOR LAYOUT OF HOME



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INTERIOR LAYOUT OF HOME



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BOMBINGS/SUICIDE BOMBINGS

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HISTORY OF SUICIDE BOMBINGS

- **Suicide bombing has been a terrorist tactic of choice for more than 30 years**
- **Suicide bombings have occurred in more than 30 countries**
- **In the United States, there have been several threats and incidents involving explosives carried by individuals**

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PROFILE AND NATURE OF EVENTS

- **Men, women and older children have been suicide bombers**
- **Targets have included buses, clubs, trains, restaurants, police checkpoints and other public locations where there are large groups of exposed people (also known as "soft targets")**

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PROFILE AND NATURE OF EVENTS (cont'd)

- **Generally, there is a disregard for "innocent victims" such as children**
- **Devices have included belts, vests, jackets, backpacks, suitcases, shoes, and even a guitar case, etc.**
- **The devices typically consist of 10 to 30 pounds of explosives that can be easily hidden in clothing or other packaging systems**

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PROFILE AND NATURE OF EVENTS (cont'd)

- **A few bombers have been killed or interdicted by police or military forces**
- **Some have been identified by citizens, but most use the element of surprise: The detonation may be the first and only indication of an attack**
- **Bombers will add or "salt" devices with nails, bolts, ball bearings and other items to act as shrapnel**

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PROFILE AND NATURE OF EVENTS (cont'd)

- **Hazardous chemicals and pesticides also have been added to the explosive devices — several bombs were detonated alongside deadly chlorine gas canisters in Iraq in the past**
- **Poisons containing an anticoagulant that prevents blood clotting also have been used in suicide bombs, causing excessive bleeding**

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PROFILE AND NATURE OF EVENTS (cont'd)

- **Bombers have been infected with diseases such as HIV and hepatitis, exposing their victims when the bomber is blown apart in the detonation.**
- **Ambulances have been used to transport bombers and devices.**
- **Recently, in Iraq, a suicide bomber-driven firetruck was used as a bomb against a U.S. Marine Corps outpost.**

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PROFILE AND NATURE OF EVENTS (cont'd)

- **Bombers have started using an armed assault to gain access into "hardened targets" before detonating**
- **Responders have been targets of initial attacks and follow-up or secondary attacks**

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RESPONSE MODES

- **Pre-detonation response**
- **Trans-incident response**
- **Post-detonation response**

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SECONDARY DEVICES

- **During any improvised explosive device (IED) or suicide bombing response, responders should understand and plan for the possibility of a secondary device**
- **Responders must be aware of their surroundings and search critical areas such as the locations designated for the Command Post (CP) and Staging**

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SCENE MANAGEMENT

- **Implement the Unified Incident Management System (IMS)**
- **The Incident Commander (IC) should implement the five C's rule:**
  - **– Confirm there is a device**
  - **– Clear the area**
  - **– Cordon off the location**
  - **– Control all entry and exit points**
  - **– Check the immediate area for secondary devices or hazards**

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SCENE MANAGEMENT (cont'd)

- **One major issue to be aware of is the so-called "double-tap" attack, when minutes after a suicide bomber attacks, a second bomber will attack the first responders or gathered crowds (i.e., Boston Marathon).**

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SCENE MANAGEMENT (cont'd)

- **A suicide bomber response is similar to a hazardous materials response with "zones of control"**
  - **– Hot Zone (where the device is located)**
  - **– Warm Zone (where the perimeter will be established)**
  - **– Cold Zone (location of Unified CP and Staging)**

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SCENE MANAGEMENT (cont'd)

- **Notify all appropriate agencies — fire, Emergency Medical Services (EMS), law enforcement, bomb squad, emergency management, and hospitals — as soon as possible if there is a report of an incident or a possible incident**

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SCENE MANAGEMENT (cont'd)

- **Maintain safe separation distances from the suspected bomber/explosives at all times.**
  – According to several guidelines, the minimum safe evacuation distance for a suicide belt loaded with 10 pounds of explosives is 1,100 feet.
  – The minimum evacuation distance for a suicide vest with 20 pounds of explosives is 1,400 feet.

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SCENE MANAGEMENT (cont'd)

- **CPs, fire, EMS and Staging Areas should be outside of the minimum evacuation distances.**

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RESPONSE STANDARD OPERATING PROCEDURES

National Institute for Occupational Safety and Health (NIOSH) recommended response guidelines:

- **Develop standard operating procedures (SOPs) for responding to potentially violent situations**

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RESPONSE STANDARD OPERATING PROCEDURES (cont'd)

- **Develop integrated emergency communication systems that include the ability to directly relay real-time information among the caller, dispatch, and all responding emergency personnel**

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RESPONSE STANDARD OPERATING PROCEDURES (cont'd)

- **Provide body armor or bullet-resistant PPE; train with this equipment, and consistently enforce its use when responding to potentially violent situations**

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RESPONSE STANDARD OPERATING PROCEDURES (cont'd)

- **Ensure all emergency response personnel have the capability for continuous radio contact, and consider providing portable communication equipment that has integrated hands-free capabilities**

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RESPONSE STANDARD OPERATING PROCEDURES (cont'd)

- **Consider requiring emergency dispatch centers to incorporate the ability to archive location or individual historical data and provide pertinent information to responding fire and EMS personnel**

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RESPONSE STANDARD OPERATING PROCEDURES (cont'd)

- **Develop coordinated response guidelines for violent situations, and hold joint training sessions with law enforcement, mutual aid, and emergency response departments**

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RESPONSE STANDARD OPERATING PROCEDURES (cont'd)

- **Shut down all on-scene radio traffic coming into the scene**
- **Portable radios should not be used within 25 feet of incident**
- **Vehicle radios/repeaters should not be used within 100 feet of incident**
- **No personal cellphones**

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HAZMAT TEAM INTERVENTIONS

- **Unified Incident Management**
- **Scene control/Control zones/Perimeter establishment**
- **Reconnaissance**
- **Product identification/research**
- **Air monitoring and sampling**
- **PPE identification**

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HAZMAT TEAM INTERVENTIONS (cont'd)

- **Evidence collection**
- **Scene stabilization**
- **Decontamination**
- **Mass fatality/Body recovery**
- **Scene documentation**

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PREPARING EMERGENCY RESPONDERS FOR RESPONDING TO HORRIFIC EVENTS

- **Scene panic/chaos**
- **Mass causality**
- **Mass fatalities**
- **Scene devastation**



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PREPARING EMERGENCY RESPONDERS FOR RESPONDING TO HORRIFIC EVENTS (cont'd)

- **Building stability**
- **Resource capability overload**
- **Short- and long-term critical incident stress**



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INTERNATIONAL ASSOCIATION OF FIRE CHIEFS' SUICIDE BOMBING "THE NEW CHAOS" VIDEO

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Activity 5.3
Suicide Bombings

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TRAIN STATION EXIT



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TRAIN STATION PLATFORM



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TRAIN



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Slide 5-107

TRAIN STATION EXIT



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TRAIN STATION STREET EXIT



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FINAL INCIDENT CONSIDERATIONS

DISASTER acronym:

- **D: Detection**
- **I: Incident Command**
- **S: Safety & Security**
- **A: Assess Hazards**
- **S: Support**
- **T: Triage & Treatment**
- **E: Evacuation**
- **R: Recovery**

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FINAL INCIDENT CONSIDERATIONS (cont'd)

- **Always conduct a visual size-up of scene.**
- **Make a visual assessment of the scene.**
- **Personal safety — is it safe to approach the scene or victim?**
- **Bystander and surrounding area safety.**
- **Curious onlookers pose many dangers.**

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FINAL INCIDENT CONSIDERATIONS (cont'd)

- **Victim safety/Scene safety considerations.**
- **Be alert for safety hazards.**
- **Do not enter an area that may be unsafe until properly trained personnel assess the risks.**
- **Be alert for the possibility of a second explosive device.**
- **Staging should occur upwind and uphill.**

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SUMMARY

- **Clandestine drug labs**
- **White powder and suspicious package screening**
- **Crime scene operations**
- **Chemical/Detergent assisted suicides**
- **Bombings/Suicide bombings**
- **DISASTER acronym**
- **Final incident considerations**

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BIBLIOGRAPHY

Internet article by August Vernon, Assistant Coordinator/Operations Officer for the Forsyth County (NC) Office of Emergency Management. The article called "Responding to a Clandestine Drug Laboratory," June 1, 2010 can be found on the Fire Engineering website at: http://www.fireengineering.com/articles/print/volume-163/issue-6/Features/responding-to-a-clandestine-drug-laboratory.html.

Internet article by August Vernon, Assistant Coordinator/Operations Officer for the Forsyth County (NC) Office of Emergency Management. The article called "Responding to a Suicide Bombing Incident," September 1, 2007 can be found on the Fire Engineering website at: http://www.fireengineering.com/articles/print/volume-160/issue-9/terrorism-and-the-fire-service/responding-to-a-suicide-bombing-incident.html.

New York State DHSES OFPC Bulletin November 1, 2010, The Chemical Suicide Phenomenon: Where is it Headed?

September 2003 Department of Homeland Security (DHS) Bulletin titled "Tactics/Techniques of Suicide/Homicide Bombers."

The article "The Fire Service Should Know about Clandestine Drug Labs" appeared in the November 1970 issue of the National Fire Protection Association's Fire Command.

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APPENDIX A
WHITE POWDER

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UNCLASSIFIED
November 2, 2004

This is an FBI – DHS – HHS/CDC Coordinated Document

Guidance on Initial Responses to a Suspicious Letter / Container With a Potential Biological Threat

A large number of potentially suspicious letters and packages continue to be reported to federal, state, and local law enforcement and emergency response agencies nationwide. In some instances these letters or packages may include powders, liquids, or other materials. Federal, state, and local response agencies should be mindful of the potential for small-scale exposure, which could result from material contained in threatening or suspicious packages. While this guidance is generally focused on the initial response to potential biological threats, all personnel responding to such incidents must be aware of the potential for exposure to hazardous chemical and/or radiological materials in addition to biological hazards. Additionally, there may be a threat posed from secondary releases or devices. Consistent with established protocols, response agencies should follow standard law enforcement procedures and hazard risk assessments in response to calls, and should pre-identify the relevant local public health points of contact to be notified in the event of a potential bioterrorism event.

The following guidelines are recommendations for local responders, based on existing procedures (including recommendations from the International Association of Fire Chiefs). This document provides guidance on the initial response to a suspicious letter/container, while other follow-on response plans, such as portions of the National Response Plan (NRP), may be utilized if a threat is deemed credible. In general, these potential threats or incidents fall into one of five general scenarios. They are as follows:

1. Letter/container with unknown powder-like substance and threatening communication (with or without illness):

Since there is an articulated threat, it is likely that the substance was intentionally introduced into the package in an effort to validate that threat. An articulated threat itself (with or without the presence of a suspicious substance) is a federal crime and may also constitute a violation under state and local statutes. The local Federal Bureau of Investigation (FBI) Weapons of Mass Destruction (WMD) Coordinator and/or FBI Joint Terrorism Task Force (JTTF), a certified HAZMAT

unit, local law enforcement, and the local public health department should be notified. The role of Incident Commander (IC) will be assumed by the appropriate authority, as designated by state or local law. In many cases, the IC will be the most senior public safety officer (most likely the fire department chief or deputy chief, however, in many circumstances it may be a local sheriff or senior local or state police official). As such, it is the responsibility of the IC to establish the Incident Command System (ICS) and to ensure that notifications of the above-mentioned responders have been made or are in the process of being made. As the referenced agencies arrive, the IC will evolve into a Unified Command, as necessary.

At this stage, and later again as necessary, the FBI will conduct a timely WMD threat assessment with local law enforcement/fire/HAZMAT personnel. Depending on the nature of the threat, this assessment may include relevant interagency partners. This process utilizes coordination from FBI Headquarters elements to conduct an initial assessment of the credibility of the threat and provide technical support to responders who are on-scene. In coordination with recommendations from the threat assessment process and the unified command on-scene, an appropriately trained HAZMAT unit should screen evidence for the presence of chemicals and radiological material and double-bag in clear sealed bags (where possible), consistent with chain-of-custody requirements. Before packaging and when possible, photographs of the letter/container should be taken and relevant information should be documented, in coordination with the FBI WMD Coordinator. Under NO CIRCUMSTANCES should an unprotected responder, such as a law enforcement officer, attempt to package an unknown substance.

If this incident involves an unopened container such as a box, it must be evaluated by a certified bomb technician/explosives ordinance disposal personnel prior to being handled by HAZMAT. Any such letters/packages must also be evaluated by the HAZMAT unit for only a broad class of radiological and chemical threats prior to being released to law enforcement personnel for transport. This is required by the laboratory in an effort to protect the staff members who will ultimately be opening the container and performing definitive biological testing and/or forensic examinations.

The FBI, or the responding law enforcement agency, will ensure that a certified HAZMAT team has performed necessary field safety screening before transporting to an appropriate laboratory. This field safety screening should be clearly documented and limited to screening for pH (for liquids), radioactivity, volatile organic compounds, flammable materials, and oxidizing agents. Definitive analysis will only be performed by the appropriate laboratory.

A chain-of-custody form must be initiated along with an incident report. The FBI will then coordinate delivery of the evidence to the designated Laboratory Response Network (LRN) laboratory for further testing and analysis.

If individuals immediately present with illness in this scenario, the public health departments will have an increased role in the initial response. These issues are further addressed in the 'Critical Response Issues for Scenario #1' included below.

If the FBI Headquarters-led threat credibility assessment process deems the threat to be credible, the FBI will immediately notify the Centers for Disease Control and Prevention (CDC), the Department of Homeland Security Operations Center (HSOC), and other appropriate federal agencies. Appropriate response guidelines to a credible threat will be utilized from the NRP, including the Biological Annex and Terrorism Incident Law Enforcement and Investigation Annex. Depending on the nature and scale of the incident, the Department of Homeland Security (DHS) may choose to help coordinate response activities based on NRP procedures which, at a minimum, may include coordinating a joint public affairs statement.

2. Letter/container with a threat but no visible powder or substances present:

Merely threatening the use of a chemical or biological agent *is* a violation of federal law and merits investigation. As in scenario #1, all of the responders should be notified. Although no powder may be visible to the eye, there could be trace amounts of material present that could represent a health risk and also provide critical forensic evidence required for further investigation and prosecution. Therefore, the guidance in Scenario #1 also applies to responses to a letter/container containing a threat with no visible powder or substance.

3. Letter/container with unknown powder, no articulated threat, and no illness:

As there is no threat and no one is ill, it must be determined if there is a logical explanation for the presence of this substance. For example, HAZMAT teams have responded to a number of letters that contained crushed samples from vitamin and pain-relief companies. If a reasonable and defendable explanation can be given as to the source of the substance, that there is no articulated threat, and that no one is ill, then no further actions are necessary.

If, however, a reasonable source cannot be determined or there is any uncertainty, the steps outlined in scenario #1 must be conducted.

4. Letter/container with no visible powder, no threat, but recipients are ill:

This scenario has the most potential for ambiguity and confusion. Those who come in contact with *Bacillus anthracis* (anthrax), or other biological pathogens/toxins, may not immediately appear symptomatic. Although no powder or substance may be available to be collected for environmental testing, public health officials may decide to utilize clinical samples from potentially exposed individuals. Additionally, in this scenario it may be difficult to determine if a letter/container is actually associated with the illness. As there is no specific threat to investigate, this is primarily a public health and medical issue; but this scenario also represents a potential criminal act that should be jointly investigated by public health and law enforcement. The initial notifications will largely be the same as scenario #1, with public health taking a primary role in the response. While the primary concern is the treatment and well-being of the recipient, public health and law enforcement should maintain close contact, while public health determines the nature of the illness and law enforcement examines any relevant intelligence. Depending on the scale and nature of the incident, if HHS/CDC is notified they will maintain close contact and coordinate with DHS. If a potential criminal nexus is identified, the FBI will conduct an initial threat assessment and initiate appropriate actions and notifications listed under scenario #1.

5. Letter/container arrives with no powder, no threat, the recipient is not ill, but the recipient is concerned about the package:

With strict regard to federal criminal statutes, no investigative actions are necessary in this matter. However, if other threat indicators are present such as excess postage, misspelled names, unusual odors/colors, etc., law enforcement and the United States Postal Inspection Service should be notified to evaluate it for potential hazards. If the assessment determines that the letter/container is "suspicious," then appropriate steps outlined in scenario #1 would be initiated.

Critical Response Issues for Scenario #1:

1. Request the assistance of the nearest certified hazardous materials response team to conduct risk assessments, field safety screening, sample (evidence) collection, decontamination, and other mitigation activities. Any sample (evidence) collection must be coordinated with law enforcement (FBI).

2. Notify appropriate law enforcement (local, state and local FBI WMD coordinator/JTTF, postal inspectors) when a potential threat is identified.

3. Do not touch, move, or open any suspicious package until an initial hazard risk assessment of the package can be performed in coordination with HAZMAT personnel and law enforcement.

4. An initial threat credibility assessment will be coordinated via the local FBI WMD Coordinator and the FBI Counterterrorism Division's Weapons of Mass Destruction Operations Unit (WMDOU). This will include the FBI Laboratory Division, Hazardous Materials Response Unit (HMRU) and other select interagency subject matter experts, tailored for the specific threat. This assessment includes an analysis of technical feasibility, operational practicability, behavioral resolve, and examination of any intelligence that might relate to the threat. If the threat is determined to be credible, other appropriate federal agencies will be notified, to include DHS and HHS/CDC. Additional information on this process is available from the NRP, including the Biological Annex and Terrorism Incident Law Enforcement and Investigation Annex.

5. Contact your local public health department (who should in turn notify state authorities and the CDC) if there is a threat of public health exposure or environmental contamination exists. HHS/CDC will then notify the HSOC, where appropriate.

6. In coordination with law enforcement, always notify the U.S. Postal Inspection Service, whenever it appears that the threat was delivered through the U.S. Postal Service. Assist with ensuring that origin and tracking information is obtained from the package (ideally, photographs of the front and back).

7. Treat the scene as a crime scene. Preserve evidence in coordination with law enforcement and ensure that materials are safely packaged. Take steps to retain enough suspicious material for:

a. Laboratory analysis;
b. Forensic examination of criminal evidence, regardless of whether the threat is ultimately determined to be accompanied by a hazardous material.

8. Transfer custody of evidence to a law enforcement officer as soon as possible. Maintain chain of custody by obtaining a record of names and signatures every time custody of a suspicious material or sample for laboratory analysis changes hands.

9. Perform basic field safety screening of the substance to rule out explosives, radiation, flammability, corrosives, and volatile organic compounds prior to transporting the materials to the appropriate LRN, as coordinated with the FBI WMD Coordinator. All field safety screening that is performed by responders should be clearly documented and shared with law enforcement and the LRN.

10. In coordination with the local FBI WMD Coordinator (and/or a responding law enforcement entity), transport samples to the designated CDC-qualified LRN facility. If field safety screening detects the presence of chemical or radiological hazards, the FBI WMD Coordinator will contact FBI Headquarters for guidance

regarding which laboratory is appropriate to perform the analysis. This will be done as part of the threat credibility assessment process noted above (see #4).

11. In coordination with public health and law enforcement, identify and list the names and contact information for anyone who may have been exposed to the suspicious substance so that they may be contacted when the LRN test results are available or if there is other additional information. If positive results are obtained, state and local public health departments will need to contact those potentially exposed as soon as possible to provide appropriate assistance (e.g., antibiotics, education, additional testing, vaccination, surveillance/symptom reporting).

12. In coordination with the FBI, identify a single point-of-contact for incident follow-up.

13. If LRN tests identify positive results for threat agents or a threat is determined to be credible, the FBI will immediately notify the DHS and other appropriate federal agencies to initiate relevant NRP actions, as necessary. The DHS will work closely with the FBI, HHS/CDC and other agencies to ensure a coordinated response.

Note on field screening

Once activities are complete to address immediate public safety concerns, every effort must be made to preserve evidence necessary for public health and law enforcement investigations.

In situations where biological threat agents are suspected, the item(s) should be field safety screened and immediately transported in law enforcement custody to an LRN laboratory. This should be done in coordination with the local FBI WMD Coordinator.

Field safety screening should be limited to ruling out explosive devices, radiological materials, corrosive materials and volatile organic compounds. Currently, there are no definitive field tests for identifying biological agents. Additional field testing can mislead response efforts by providing incorrect or incomplete results, and destroy limited materials critical for definitive laboratory testing required to facilitate any appropriate public health and law enforcement response.

This information is provided for guidance. Questions related to the content of this document can be addressed to your local FBI WMD Coordinator.

APPENDIX B
CHEMICAL ASSISTED SUICIDES

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Chemical Assisted Suicide: Responder Information

Problem: There is no longer a routine call. Recognize that every response is unique and treat as such. Always wear proper PPE and SCBA.

- First responders "unexpected" chemical exposure concern
  - Ensure that dispatch information is shared between all disciplines to enhance responder safety
  - Be alert for information indicating the potential for occupants in any enclosed space
  - First responders must utilize the proper protective equipment
- Mixing household chemicals to create toxic vapors
  - Look for and recognize containers that may indicate presence of common household chemicals
- In most cases, two (or more) chemicals will be mixed to produce vapors

Analyze the Problem

- Recognition/ID and Warning Signs
  - Open containers or a 'mixing container'. Chemicals may not be properly marked/labeled
  - Do NOT rely on suicide notes or placards near the entry pathway for first responders which warn of danger
  - Open containers or household chemicals where they would not normally be found (vehicles, bedrooms, etc.)
  - Taping of doors, windows, dash vents, openings or other attempts to seal the enclosure
- Locations: Vehicles and Structures
  - If this is a chemical suicide remember it is a crime scene and once life safety considerations are met to treat as such
  - Look for indicators in the surrounding area and question occupants. After analysis, vehicles and structures can be ventilated. Do NOT rely on presence or lack of chemical/unusual odors. Be aware of contact with liquids or powders and provide decontamination for occupants and responders

Plan the Response

- Two seconds to look into the vehicle for signs of a suicide (mixing vessels, residue, containers), ten seconds for law enforcement
- Response Options
  - Rescue/Recovery
  - Evacuation/Isolation
  - Protective handline
  - Decontamination
  - Preserve evidence
- Selection of PPE
  - Follow department policy and procedure for proper PPE and respiratory protection selection
- Obtain control of air monitoring equipment
- Selection of Decontamination
  - Occupants need to be decontaminated using a simple water shower of 3-5 minutes, following clothing removal
  - Technical decontamination should be established for entry teams conducting control tasks
- Plan of Action
  - Implement agency Hazardous Materials Response Protocols
  - Develop a site safety plan
  - Use a ***Risk Based Response*** control plan that is based on possible options listed above
  - Vehicle vs. Structure
    - Compartment size will/can play a role in the levels of concentration, resulting in varying levels of evacuation/shelter in place options
    - The smaller the compartment the higher the concentration -> higher toxic levels and potential to reach LEL levels
    - Ventilate all occupancies to change the concentration levels of the environment
    - Open the doors to vent and remove any occupant(s)
      - Check for signs of life prior to removal (chest movement, body movement)
      - If vehicle/structure is locked and there are no signs of life, isolate and warn others
- Evacuation vs. Shelter in place – a determination must be made of which method will be more effective in life safety

Implement the Plan

- Handline (vapor disbursement or extinguishment)
  - Vapor Disbursement - Use water spray to reduce vapors or divert vapor cloud drift. Attempt to control and isolate runoff
  - Extinguishment - May form explosive mixtures with air. May be ignited by heat, sparks or flames
- Ventilation/Change the Environment – Properly trained and equipped first responders should ventilate after a thorough analysis of potential hazards
- Air monitoring - Should be conducted throughout the incident and until evidence has been collected and the scene rendered safe
- Victim transport – Decon prior to leaving the scene; methods will be based on occupant's status
- Decontamination – All entry team members should undergo a technical decon according to local protocols. Beware of potential for occupants and clothing to 'off-gas' trapped vapors. EMS and the hospital must be notified in advance in order to avoid contamination of personnel/equipment
- Crime scene considerations – Minimize responder exposure while preserving evidence and supporting law enforcement

Evaluate

- Maintain Situational Awareness – Don't count on warning signs. Be aware of secondary contamination

CHEMICAL PROPERTIES

Hydrogen Sulfide

Description	Colorless gas	**Odor threshold**	0.77 ppm
Molecular formula	H_2S	**Odor description**	Rotten egg
Molecular weight	34.08	**Exposure route**	Inhalation
Density	1.19 (≈ 20% heavier than air)	**Signs & symptoms**	Irritation of respiratory system & eyes, apnea, coma
Auto ignition temperature	260°C (500°F)	**LEL/UEL**	4%, 44%
Vapor pressure	15, 600 mm Hg @ 25°C (77°F)	**IDLH**	100 ppm
Solubility	Soluble in water, hydrocarbon solvents, ether and ethanol	**Detection**	PID with 10.6 eV lamp
Notes	Death by inhalation can occur quickly at low levels		

Hydrogen Cyanide

Description	Bluish-white liquid/colorless gas	**Odor threshold**	0.58 ppm
Molecular formula	HCN	**Odor description**	Bitter almond (odor may not be detected by smell)
Molecular weight	27.03	**Exposure route**	Inhalation, absorption
Density	0.94 (lighter than air)	**Signs & symptoms**	Respiration/depth change, confusion, asphyxia
Auto ignition temperature	538°C (1000°F)	**LEL/UEL**	5.6%, 40%
Vapor pressure	630 mm Hg @ 20°C (68°F)	**IDLH**	50 ppm
Solubility	Miscible in water, alcohol, slightly soluble in ether	**Detection**	PID with 13.6 eV lamp
Notes	Death by inhalation can occur quickly at low levels		

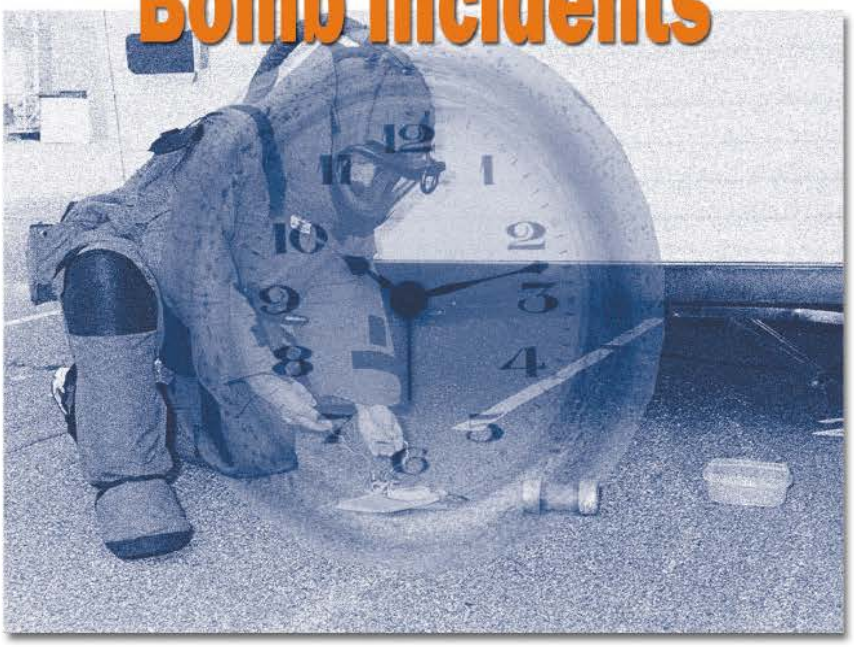
For more information on chemical assisted suicide response visit www.hazmatfc.com

APPENDIX C
BOMBINGS/SUICIDE BOMBINGS

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A Guide to Handling Bomb Incidents



Published by the
Georgia Bureau of Investigation

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Preface

This guide is a condensed reference for bomb searches, bomb threats, and the discovery of suspicious items or explosive devices. It is impossible to provide a complete overview of all scenarios, as each incident, location and facility is unique. Prior to an actual incident, a Bomb Incident Plan should be developed that outlines how a bomb threat will be handled. Incorporate the elements from this guide into your organization's Bomb Incident Plan and then train personnel in implementing the procedures. Additional training is strongly suggested in bomb search and bomb threat response techniques. Preparedness is the difference between life and death with incidents involving explosive devices.

For more information on developing a Bomb Incident Plan, contact your local law enforcement agency or the Georgia Bureau of Investigation Bomb Disposal Unit at 404-244-2600.

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Bomb Incident Plan

The first line of defense in dealing with a bomb incident is to develop a plan that manages how your facility's personnel will respond to an actual emergency. A Bomb Incident Plan reduces the dangers to everyone involved, lessens confusion, and minimizes the loss of production time. A working plan outlines how to handle a bomb threat, how to conduct a search, what to do when a suspicious item is located, and establishes evacuation procedures.

A Bomb Incident Plan should include the following elements:

- Designate a chain of command
- Establish a command center
- Decide what primary and alternate communication will be used
- Establish clearly how and by whom a bomb threat will be evaluated
- Decide what procedures will be followed when a bomb threat is received or device discovered
- Determine to what extent the available bomb squad will assist and at what point the squad will respond
- Provide an evacuation plan with enough flexibility to avoid a suspected danger area
- Designate search teams
- Designate areas to be searched
- Establish techniques to be utilized during a search
- Establish procedures to report and track progress of the search and a method to lead qualified bomb technicians to a suspicious package
- Have a contingency plan available if a bomb should explode
- Establish a simple-to-follow procedure for the person receiving the telephone threat
- Review your security plan in conjunction with the development of your Bomb Incident Plan

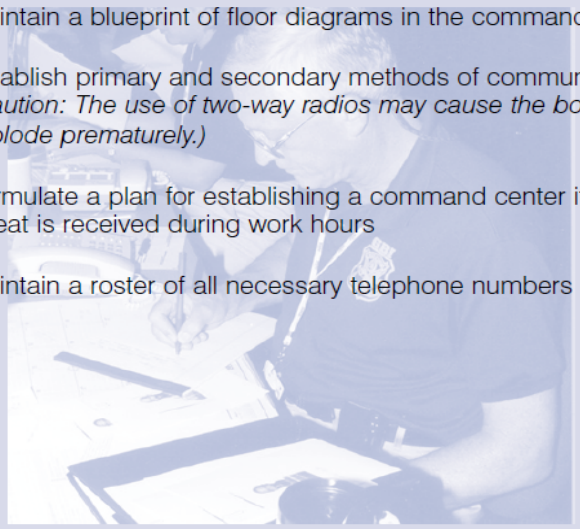
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Command Center

A key element of any Bomb Incident Plan is establishing a centralized location away from potential dangers where critical decisions can be made and the Bomb Incident Plan implemented. Personnel assigned to the command center provide direction on the steps that need to be taken and brief public safety on the incident as they arrive at the scene. A center should be established as soon as a viable threat is received.

Here is a guide to setting up a command center. Please note that some changes may be necessary to accommodate your facility.

- Designate a primary location and an alternate location
- Assign personnel and designate decision-making authority
- Establish a method for tracking search teams
- Maintain a blueprint of floor diagrams in the command center
- Establish primary and secondary methods of communication *(Caution: The use of two-way radios may cause the bomb to explode prematurely.)*
- Formulate a plan for establishing a command center if a threat is received during work hours
- Maintain a roster of all necessary telephone numbers



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The Telephone Threat

When a bomb threat is made by telephone, the individual receiving the call must be prepared to ask a series of questions. ***If possible, the threat should be tape-recorded.***

Questions to ask caller:

- When will the bomb explode?
- Where is the bomb?
- What does the bomb look like?
- What kind of bomb is it?
- What will cause the bomb to explode?
- Did you place the bomb?
- Where are you calling from?
- What is your address?
- What is your name?

Individual who received call should note:

Is the voice familiar and whom did it sound like? _____

List any background noises: _____

Name of person who received the call: _____

Date and time the call was received: _____:_____a.m./p.m.

Reported call immediately to: _____-_____

Note any accents or voice characterizations in the caller's voice. Circle those that pertain to the caller:

Accent	Lisp	Rapid	Sincere
Disguised	Slurred	Loud	Angry
Deep	Nasal	Normal	Excited
Broken	Squeaky	Calm	Crying
Stutter	Slow	Stressed	Giggling

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Response Options

When a telephone threat is received, there are three possible ways you can respond to the threat.

IGNORE threat

Not advisable. By choosing to ignore, innocent lives are placed at risk.

OR

EVACUATE immediately

Disruptive effect on the facility. A suspect may have placed the bomb at an exit normally used to evacuate and then called in the threat.

OR

EVALUATE the threat, **SEARCH**, and if necessary, **EVACUATE**

Use all available indicators to make an informed evaluation. Conduct a search to determine whether evacuation may be warranted. If indicators are NOT present, then evacuation may not be necessary.

Threat Indicators

These are some possible indicators of a valid threat, but they are not inclusive. Additional indicators unique to the threat at your facility may cause you to decide to take action.

- Suspect package present (to include obvious explosive device)
- Suspicious person(s) in your facility
- Signs of forced entry on windows or doors (indicating that someone may have made an unauthorized entry)
- A note or message inside the facility indicating that the suspect may currently be or may have been inside the facility
- Identification of disgruntled individuals who may have a motive to disrupt your facility and the opportunity to place a bomb
- Previous threats or actual explosive devices at your facility

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Canine Searches

When to call for an explosive detection canine:

Canines are best for use in searching for bombs and explosives in the following areas *(but not limited to)*:

- Locked containers, including school lockers
- Hidden compartments
- Concealed bombs and explosives
- Large open areas
- Vehicles

Canines should not be used to evaluate packages already deemed suspicious. This endangers the canine handler as well as the canine. Once a package has been deemed suspicious, it is then the responsibility of a certified bomb technician to analyze and render safe. A canine could accidentally disturb a package causing injury to the handler and the canine.

A suspicious package may not be explosive in nature but contain other hazardous items. A canine may not recognize these potential hazards.

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Team Searches

When possible use more than one person to conduct a search no matter how large the area. Designate a search team leader.

Who should conduct searches?

SUPERVISORY PERSONNEL

Positive benefits: Rapid search, little disruption
Negative impact: May create employee morale problems and may sacrifice thoroughness

OR

AREA OCCUPANTS

Positive benefits: Thoroughness, rapid search, less disruption to workday, positive effect on morale (when properly trained)
Negative impact: Requires training, increased danger to workers

OR

TRAINED EXPLOSIVE SEARCH TEAMS

Positive benefits: Safest for employees
Negative impact: Loss of production time for facility, search may be limited and less thorough because the trained search team is not as familiar with the facility as area occupants

Conducting Outdoor Searches

Always remember common areas and areas readily accessible to the public may be prime locations for the placement of explosive devices. These locales may be good starting points for your search.

The following contains only basic search techniques and is not meant to include all possible searches:

Grid Pattern Searches

The Two-person Grid Pattern Search is one of the more common search methods and utilizes overlapping techniques. Have a team leader identify the area to be searched outside the building. Line up at each end of the search pattern. Conduct the search shoulder to shoulder from one end of the search area to the opposite end. Turn and repeat the process until the area is covered.

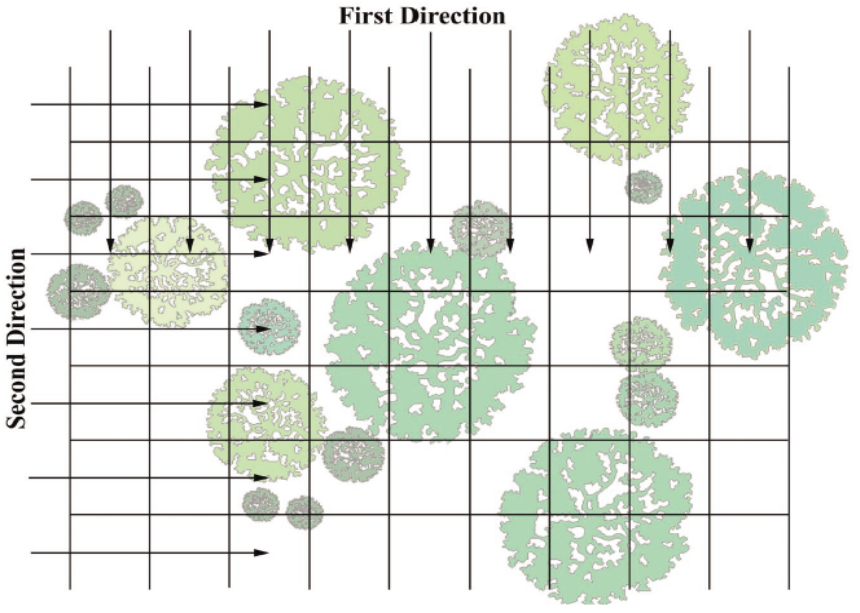
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A second search with the team members alternating their positions provides for additional thoroughness. In areas where little cover for a bomb is present, the search may be expedited by increasing the width of coverage for each member of the search team.

Where to Search

- Trash containers, motor vehicles, shrubs, manholes, sewers, trees, flower boxes, and building ledges are all possible locations where a bomb could be concealed.
- Look for fresh dirt or disturbed mulch around the shrubbery that could indicate a bomb has been concealed in the ground. Also don't forget to look up.
- Be mindful that bombs could be placed in or near evacuation routes.

Two-person Grid Pattern Search



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Conducting Indoor Searches

Care should be taken not to turn on or off lights since some explosive devices can be built to function with a light switch.

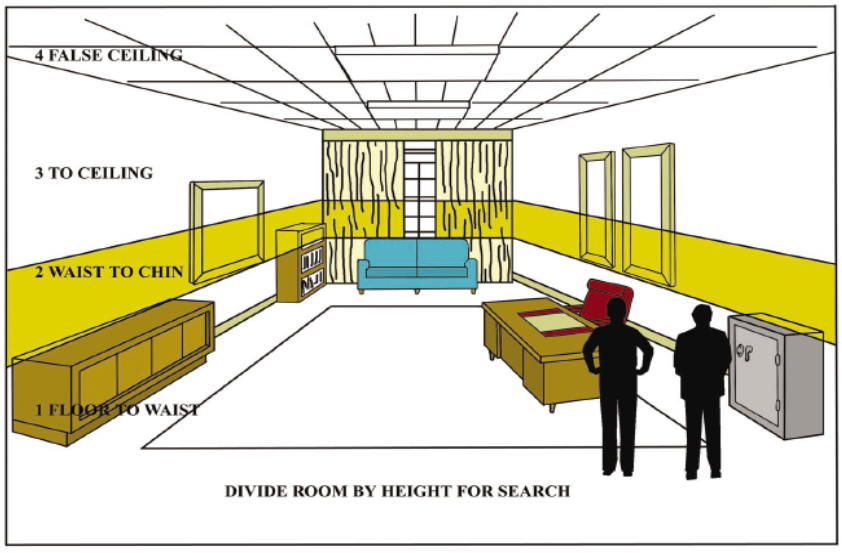
As the search team enters the room, the members should disperse to various areas of the room and listen for ticking associated with clockwork mechanisms used in timed explosives. The group also should note the background noise level.

Prepare for Search

The team leader should:

- Divide the room into two equal parts using an imaginary division line.
- Divide the room into at least three different height search areas:

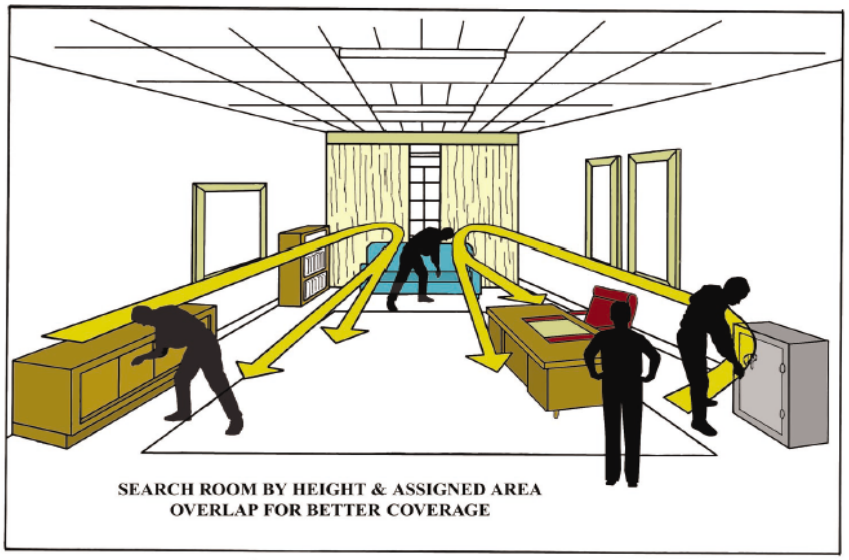
Floor to waist
Hip to shoulder
Shoulder to ceiling
In the case of a suspended ceiling, a fourth area above the suspended ceiling



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Search Procedures

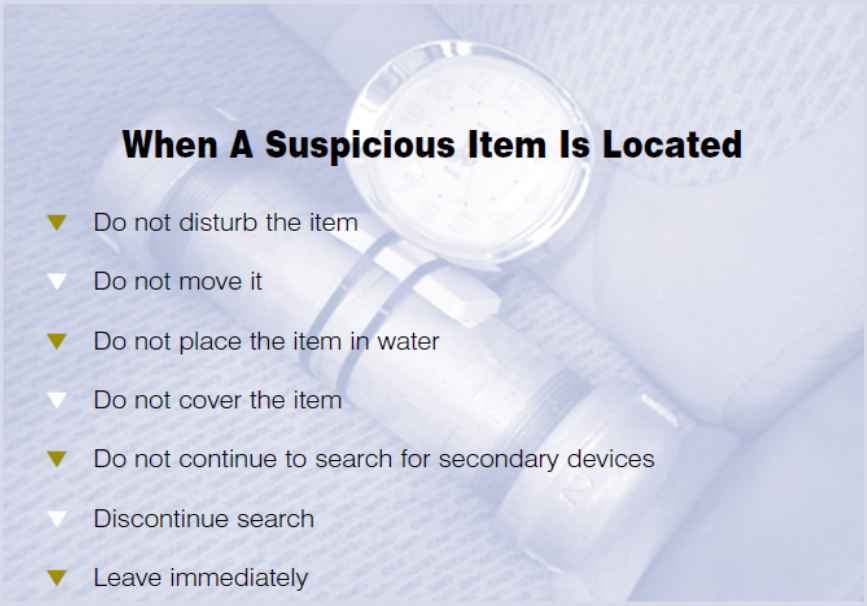
- Both search team members should go to one end of the room division line and begin from a back-to-back position. This starting point should be used for each successive searching sweep.
- Each person searches his/her way around the wall area of the room from floor-to-waist height, working toward the other person. When both members of the search team meet, a "wall sweep" has been completed.
- Return to starting position and conduct a "hip-to-shoulder sweep" followed by a "shoulder-to-ceiling sweep" using the same procedures. A second search with the team members alternating previous search areas provides additional thoroughness.
- As the search is conducted, be mindful of area rugs, ventilation ducts on the floor, walls and ceiling, light fixtures, built-in cabinetry, trash containers and furniture.
- Once the search of one area is completed, mark the area as "searched" either by placing a piece of tape or paper on the entrance so as to prevent duplication of the search effort for other teams. Proceed to the next search area if applicable.



SEARCH ROOM BY HEIGHT & ASSIGNED AREA
OVERLAP FOR BETTER COVERAGE

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When A Suspicious Item Is Located

- Do not disturb the item
- Do not move it
- Do not place the item in water
- Do not cover the item
- Do not continue to search for secondary devices
- Discontinue search
- Leave immediately
- Evacuate the building. Identify the danger area and block it off with a clear zone. Use a 1,000-foot evacuation distance if available or a minimum of 300 feet with shielding, such as buildings or natural dirt barriers. Stay away from glass windows and doors.
- Report the location and a description of the suspicious item to the command center.
- Leave the doors and windows open to the area unless public access to the area needs to be restricted (ie: public schools or businesses where locking or closing the doors may be necessary to prevent inadvertent or curious onlookers from entering).
- Return to the command center and meet with public safety personnel for debriefing.
- Do not permit re-entry into the building until the item has been cleared by public safety personnel.

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Evacuation Procedures

Prior to evacuation, check the evacuation route(s) for other explosives or hazards that could cause injury.

Handicapped Evacuation

Special consideration should be given to evacuees who may be handicapped or have disabilities. As a Bomb Incident Plan is developed, review the proposed plan with individuals who have disabilities to ensure their special needs are addressed in cases of evacuation.

Evacuation Distances

Evacuation distances can be expanded as needed. The size of the bomb may warrant increasing the evacuation distance.

As a general rule:

- Evacuate to a minimum distance of 1,000 feet and use shielding, such as a building or other hard structures between evacuees and the suspicious item. Natural or manmade dirt berms also may be used as shielding.
- In cases where 1,000 feet is not feasible, use the greatest distance available with shielding between the evacuees and the suspicious item.
- Stay away from glass windows and glass doors.

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Communications

In cases of entry by an intruder with a suspicious package, use whatever form of communication necessary to contact public safety personnel, then follow the guidance of the local emergency 911 center or the local public safety agency.

Hazardous Forms of Communication

- Cellular telephones: Turn off all cellular phones within 1,000 feet of a suspicious item.
- Cordless telephones: Never use a cordless phone in the presence of a potential explosive device.
- Walkie-talkies or radios: Do not transmit or talk on walkie-talkies or radios. If possible, turn them off unless it is necessary to listen without transmitting.
- Pagers: Turn off pagers that transmit messages. Pagers that "receive only" may be left on.

Safer Forms of Communication

- Verbal communication
- Visual signals: Hand signals, colored flags or paper
- Telephones using a hard-wire system
- Bullhorns
- Public address systems that have hard-wire links

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Large Vehicle Bomb Evacuation Distances

GBI	VEHICLE DESCRIPTION	MAXIMUM EXPLOSIVES CAPACITY	LETHAL AIR BLAST RANGE	MINIMUM EVACUATION DISTANCE	FALLING GLASS HAZARD
	Compact Sedan	500 lbs. 227 kilos (In trunk)	100 Feet 30 Meters	1,500 Feet 457 Meters	1,250 Feet 381 Meters
	Full-sized Sedan	1,000 lbs. 455 kilos (In trunk)	125 Feet 38 Meters	1,750 Feet 534 Meters	1,750 Feet 534 Meters
	Passenger Van or Cargo	4,000 lbs. 1,818 kilos	200 Feet 61 Meters	2,750 Feet 838 Meters	2,750 Feet 838 Meters
	Small Box Van (14 ft. box)	10,000 lbs. 4,545 kilos	300 Feet 91 Meters	3,750 Feet 1,143 Meters	3,750 Feet 1,143 Meters
	Box Van or Water/Fuel Truck	30,000 lbs. 13,636 kilos	450 Feet 137 Meters	6,500 Feet 1,982 Meters	6,500 Feet 1,982 Meters
	Semi-Trailer	60,000 lbs. 27,273 kilos	600 Feet 183 Meters	7,000 Feet 2,134 Meters	7,000 Feet 2,134 Meters

Source: Bureau of Alcohol, Tobacco & Firearms

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www.ganet.org/gbi

APPENDIX D
EMERGENCY RESPONSE TO POST-BLAST INCIDENTS

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Explosives Post-Blast Response
FIRST RESPONDER AWARENESS CARD

Post-blast (or post-detonation) response takes place after an explosion has occurred. An explosives event has the potential to overwhelm first responders due to the large number of victims, fatalities and property destruction.

DISPATCH AND RESPONSE PHASE

- When responding get all the dispatch information available. Nature of the call and location are important.
- **Standard guidelines against the use of cell phones and radios may not be applicable during an actual "explosion". There will be an overriding need for a rapid and coordinated response. If possible do not use radios within 150 feet of the blast site and use other resources such as runners in the "hot zone".**

ARRIVAL ON SCENE

- Proceed with extreme caution for your own safety.
- Slow down when approaching the area and conduct a 360-degree scan during your scene-size up or "windshield survey".
- Look for objects and people that seem out of place for the location or time of the call - if it looks suspicious it probably is.
- Use Staging Area to limit number of responders - don't stack up responders and resources in one location.
- Law enforcement should immediately disperse any crowds and establish an outer security perimeter.
- Avoid entering blast areas (Hot Zone) unless it is necessary to save lives.
- ***ALWAYS BE AWARE OF SECONDARY DEVICES!***

APPROACHING THE AREA

- Rapidly implement the Incident Command System (ICS).
- Establish hazard Control Zones around the incident (Hot, Warm, Cold).
- Always have an escape route open to leave the scene quickly if needed.
- All responders should wear all available Personal Protective Equipment (PPE).
- Trained bomb technicians and explosive canines should search for secondary explosive devices during and after the response.
- Appropriate agencies – Fire, EMS, Law Enforcement, specialized bomb personnel, Emergency Management, and hospitals should be notified as soon as possible if there is a report of an incident or possible incident.
- ***BE VERY CAUTIOUS OF ANY ITEMS THAT AROUSE YOUR CURIOSITY!***

Response sheet is for training and informational purposes only. Please utilize local guidelines and procedures.

Version 1, Page 1, December 2008, August Vernon fdtac@yahoo.com

RESPONSE OPERATIONS

- Law Enforcement will need to prioritize force protection resources around areas of critical operations and the scene.
- An explosives incident has the potential for large number of victims with very traumatic injuries.
- Searching the beyond immediate scene for victims unable to call for help. This may be especially needed in a dense urban environment, where persons injured in upper stories of building were injured/affected (directly by the attack or elderly suffering a health condition).
- Some seriously injured victims may have no visible wounds and some victims may be beyond help.
- Quickly remove victims from the area and render aid in a secure location. Triage must be conducted outside the hazard area. The use of SKEDS, litters or backboards is recommended.
- EMS may need to implement disaster procedures such as triage tags, casualty collection points and field treatment areas for minor injuries.
- Implement local mass-casualty/mass-fatality procedures.
- Triage will be conducted at least twice, once at the blast scene and again at the hospital.
- Expect numerous types of injuries from traumatic injuries, blast pressure or internal injuries, burns and shrapnel.
- Responders must immediately monitor for other hazards such as chemical agents, gases or radioactive materials.
- If a vehicle or structural fire is involved, Fire should conduct a rapid knockdown while considering evidence.
- Be aware of secondary hazards such as unstable structures, damaged utilities, hanging debris, void spaces and other physical hazards.
- Consider the need for other assets such as Urban Search and Rescue, Hazardous Materials Teams, Incident Management Teams, etc.
- ***Be aware of the possibility of secondary devices and attacks. This type of event has targeted responders.***

CRIME SCENE CONSIDERATIONS

- Establish as large a crime scene perimeter as possible as rule of thumb for the perimeter is to extend the perimeter 50% from where the farthest piece of evidence is located.
- Plan on an intensive media response.
- Make immediate notifications of local, state and federal resources.
- Plan on an extensive, multi-day crime scene investigation.

DO NOT ATTEMPT TO APPROACH, MOVE, HANDLE OR DISARM A CONFIRMED OR SUSPECTED IED; THIS IS A JOB FOR SPECIALLY TRAINED PERSONNEL.

Response sheet is for training and informational purposes only. Please utilize local guidelines and procedures.

Version 1, Page 2, December 2008, August Vernon fdtac@yahoo.com

UNIT 6: MANAGING HAZARDOUS MATERIALS INCIDENTS

TERMINAL OBJECTIVES

The students will be able to:

1. *Analyze information related to the incident, extrapolate the potential course and harm, and using a risk-based approach, determine objectives, strategies and tactics in order to develop a plan of action for each scenario, given several scenarios of varying complexities.*

2. *Implement an effective Incident Command System (ICS) for the scenario.*

3. *Manage a hazmat incident using their Incident Action Plan (IAP).*

ENABLING OBJECTIVES

The students will:

1. *Identify the presence of hazmat at a simulated incident.*

2. *Select appropriate emergency response actions for first responders at the operations technician response level.*

3. *Identify and develop appropriate safety measures to protect the responders, public and environment.*

4. *Develop an IAP for an incident with multiple operational periods.*

5. *Describe the process of termination and recovery for a simulated incident.*

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INTRODUCTION

This unit will provide you with the opportunity to apply the hazardous materials incident management skills developed during this course presentation. The scenarios will range from relatively small and simple incidents to those that will tax resources and span several operational periods.

As a group, you will be asked to review scenario materials, research various elements of hazmat references, determine appropriate strategic goals, assign appropriate tactical objectives, and develop site safety plans for simulated incidents.

As you process the activities, you will be reminded to keep your actions at the incident management level and not dwell on tactics and tactical methods. This is not a technician course but an incident management program. Your mission at all times will be to keep your response personnel safe while performing actions within a standard of care.

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Group Exercises Scoring Guide

Date: _____

Group Name (if applicable): _____

Group Members:

_____

_____

_____

_____

_____

_____

Instructor Comments:

Training Specialist Comments:

Group Exercises Scoring Guide

Categories					
	Poor 4 pts.	**Fair** 6 pts.	**Good** 8 pts.	**Excellent** 10 pts.	**Comments**
Presentation Was it organized? Could the group answer all questions?	Presentation was not clear. Information was not well-organized. Group members were unable to answer questions.	Presentation was audible, but needs improvement on tone of voice when speaking. Information was somewhat organized. Group members were able to answer some questions when asked by teacher or other students.	Presentation was audible. Good tone of voice when speaking. Information was very well-organized. Group members were able to answer most questions posed by teacher and other students.	Presentation was of professional caliber. Information was extremely organized and easy to follow. Group members were able to answer all questions posed by the other students as well as the teacher.	
Visual Aids/ Documentation Visual aspects of project were well-organized and easy to understand. Documentation was adequate to justify decision processes.	Visual aids/ Documents were very disorganized and hard to read. Contained lots of grammatical/ technical mistakes.	Visual aids/ Documents could be better organized and easier to read. Some grammatical/ technical errors.	Visual aids/ Documents were organized and easy to read. Very few grammatical/ technical errors.	Visual aids/ Documents were easy to read and understand, organized, and creative. No grammatical/ technical errors, demonstrated risk-based decision-making and creativity.	
Group Work Time Did the group use time opportunities to work collaboratively and in a coordinated manner?	Did not use time wisely when working together as a group. Group did not stay on task and did not work on project.	Needs improvement on how to use time wisely when working together in a group. Group basically stayed on task, but was not fully focused on project. Teacher had to speak to the group to keep them on task.	Used time wisely when working together in group. Group was focused on task. Asked questions when stuck or required guidance.	Group stayed on task for the entire class time allotted for the project. Group was organized and able to complete project with little to no assistance from the teacher.	

Technical Content Did the group analyze the information, extrapolate the incident course, and decide on a plan of action?	The group failed to justify the identified objectives relevant to safe, risk-based operations.	The group needed to improve the justification of the selection of objectives and estimation of potential course and harm.	The group analyzed the scenario, justified the objectives, and exercised good judgment.	The group analyzed the scenario, estimated the potential course and harm, and made sound risk-based decisions related to the selection of objectives and development of the plan of action.	
Participation Did everyone present equally?	One or two members of the group did all the work. Some refused to participate or were not allowed to help.	One or two members of the group didn't help complete tasks. Group was constantly covering for group members or not encouraging them to participate. Most members presented.	All group members worked on their own assignments. No one did more work than anyone else. Some communication, but mostly worked separately. All members presented.	All group members worked on their assignments, but also collaborated frequently. Clear connection and communication between the group members. All members presented.	

Group Exercises Scoring Guide

The objectives of the group exercises are that, given several scenarios of varying complexities, the students will analyze information related to the incident, extrapolate the potential course and harm, and using a risk-based approach, determine objectives, strategies and tactics in order to develop a plan of action for each scenario; and students will implement an effective ICS and manage the incident scenario.

The group exercises will be facilitated sequentially and may build upon each other. There are four exercises:

1. Activity 6.1: John's Bavarian Dairy Incident.

2. Activity 6.2: Dean's Chemicals and Paint Works Incident, Part 1.

3. Activity 6.3: Dean's Chemicals and Paint Works Incident, Part 2.

4. Activity 6.4: Termination and Recovery.

The Group Exercises Scoring Guide is the graded group exercises evaluation instrument, and it uses five categories that are worth a maximum of 10 points each. All members of the group receive the same grade. Each group is expected to provide a synopsis of the product, container and the environment; describe the analytical approach to extrapolating the potential course and harm for the incident; and develop and justify a safe, effective and efficient risk-based plan of action. The presentations should demonstrate that the group successfully researched, communicated, and collaborated in determining the risk-based decisions regarding strategic and tactical actions in the development of the plan of action and implementation of the ICS and successfully managed the incident to termination and recovery.

The instructors will use the Group Exercises Scoring Guide to evaluate the group presentations based on the elements included in the categories. The Group Exercises Scoring Guide will identify the group members and be given to the training specialist at the conclusion of the course along with completed answer sheets and course grade sheets.

ACTIVITIES

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Activity 6.1

John's Bavarian Dairy Incident

Purpose

To apply the appropriate strategic goals of an incident involving one or more hazardous materials and determine appropriate tactical objectives. The response will primarily involve first responders trained to the operations level.

Directions

1. Review the material provided for John's Bavarian Dairy Incident.

2. Review resources for your city (Center City) as well as neighboring communities.

3. Complete the following assignments in your small groups:

    a. Determine critical size-up factors. Complete Size-Up Information Worksheet.

    b. Determine which hazmat strategic goals are to be used. Complete Strategic Goals/Incident Objectives Worksheet.

    c. Determine what tactical objectives would be appropriate to meet the selected strategic goals. Complete Tactical Objectives Worksheet.

    d. Determine what decontamination measures are appropriate. Complete Decontamination and Critical Safety Factors Worksheet.

    e. Evaluate critical safety issues that are present and determine what risk management measures you will implement. Complete Risk Management Worksheet.

    f. Complete ICS Form 201, Incident Briefing; ICS Form 202, Incident Objectives; ICS Form 203, Organization Assignment List; ICS Form 206, Medical Plan; and ICS Form 208HM, Site Safety and Control Plan as directed by instructors.

4. Diagram your incident management structure on an easel pad.

5. Select a representative to explain how you managed this incident.

Scenario

This morning at 5:10, 911 received a call reporting a strong odor in the area of John's Bavarian Dairy processing and warehouse facility, located at 1455 Flower Street in Center City. The reporting party, a worker in the warehouse, stated that a man was injured and unconscious on the loading dock of the dairy. The caller stated that he was operating a forklift at the time and appears to have hit something in the warehouse near the loading dock door.

Engine 1, Rescue 1 and Ladder 1, along with Car 2 (duty assistant chief), have been dispatched at 5:11 a.m. Ambulance 1 with two basic life support (BLS) responders is also dispatched. The ambulance was just completing a previous call and will respond from the hospital.

Engine 1 arrives at 5:14 a.m. with an arrival report of a strong odor of ammonia in the area. One plant worker is outside having difficulty breathing, and one worker is reported unconscious at the door of the loading dock and the warehouse. There does not appear to be any immediate issues of exposures, and the Engine 1 captain is establishing Flower Command. Car 2 reports to Flower Command that it has been involved in a minor traffic incident and will be delayed 15 to 20 minutes. Rescue 1 arrives at the scene at 5:15 a.m., and the lieutenant reports to Flower Command for orders. The weather conditions are as they are today outside your classroom.

Ambulance 1 reports to Flower Command that its arrival has been blocked by a train on the grade crossing at Park Street and Broadway Street. It will need to find another route to the scene. Engine 2 and Ladder 1 have staged one-half block away on Broadway Street and are awaiting directions.

Flower Command is advised by the lieutenant from Rescue 1 that if she is to declare this a hazmat incident, it will take approximately 20 minutes to return to quarters where the reserve Engine/Hazmat Unit is located and return to the scene as a Hazmat Team. The lieutenant suggests that the Incident Commander (IC) consult the U.S. Department of Transportation (DOT)/North American Emergency Response Guidebook (NAERG) to see if any actions can be implemented using current personal protective equipment (PPE). Soon after, the lieutenant informs the IC that Rescue 1 has located a remote valve for the ammonia tank and closed it; the product in the lines should be depleted in about 30 minutes.

Dispatch informs Flower Command that he has not activated the pagers of the call members. He reminds Flower Command that there are two engines available for calls in the rest of the city.

Activity 6.1 (cont'd)

Center City Resource Inventory

Resource Provider	Resource	Special Information
Center City	**Police Department**	
	Total uniformed staff 124	Normal shift manning:
	1 Chief	day 30, afternoon 30, midnight 22
	2 Assistant Chiefs	
	10 Shift Sergeants	
	8 Detectives	Trained as crime scene evidence techs
	2 Juvenile Officers	
	10 Special Services Units	SWAT, hostage negotiation, explosives
	10 Office and detention (3 holding cells)	
	59 Patrol Officers	
	2 Training Specialists	
	22 Reservists (Peace Officers)	Traffic, parade duty, special events
	Special equipment	30-passenger bus, robot (Bomb Unit) 14-foot boat on trailer, 50-horsepower (hp) motor
	Note: All police officers are state certified, the department is nationally accredited, all cars have automated external defibrillators (AEDs), and several officers are emergency medical technician (EMT) certified.	
	Fire Department	
	Total uniformed staff 111 full time, 32 call members (firefighter 1 certified)	
	1 Chief	
	4 Assistant Chiefs	
	1 Training Captain	
	4 Fire Prevention/Inspection/Investigation Officers	
	Engine 1 — 1,500 gpm, 1,000 gal. tank (staffs 4)	
	Engine 2 — 1,500 gpm, 1,000 gal. tank (staffs 4)	
	Engine 3 — 1,500 gpm, 1,000 gal. tank (staffs 3)	
	Engine 4 — 1,250 gpm, 750 gal. tank (staffs 3)	
	Ladder 1 — 100-foot ladder w/1,500 gpm and 200 gal. tank (staffs 3)	
	Reserve Engine 5 — 1,000 gpm, 500 gal. tank — not staffed	
	Rescue Engine 1 — 1,500 gpm, 1,000 gal. tank (staffs 5) (responds to all calls)	
	Special Services Unit 1 — reserve engine equipped as a Level A Hazmat Unit staffed by Rescue 1 staff when needed (carries 100 gal. aqueous film-forming foam (AFFF))	
	Ambulance 1 — BLS (staffs 2)	
	Reserve Ambulance 2 — not staffed	
	Special equipment	City command bus 14-foot rescue boat w/35-hp motor

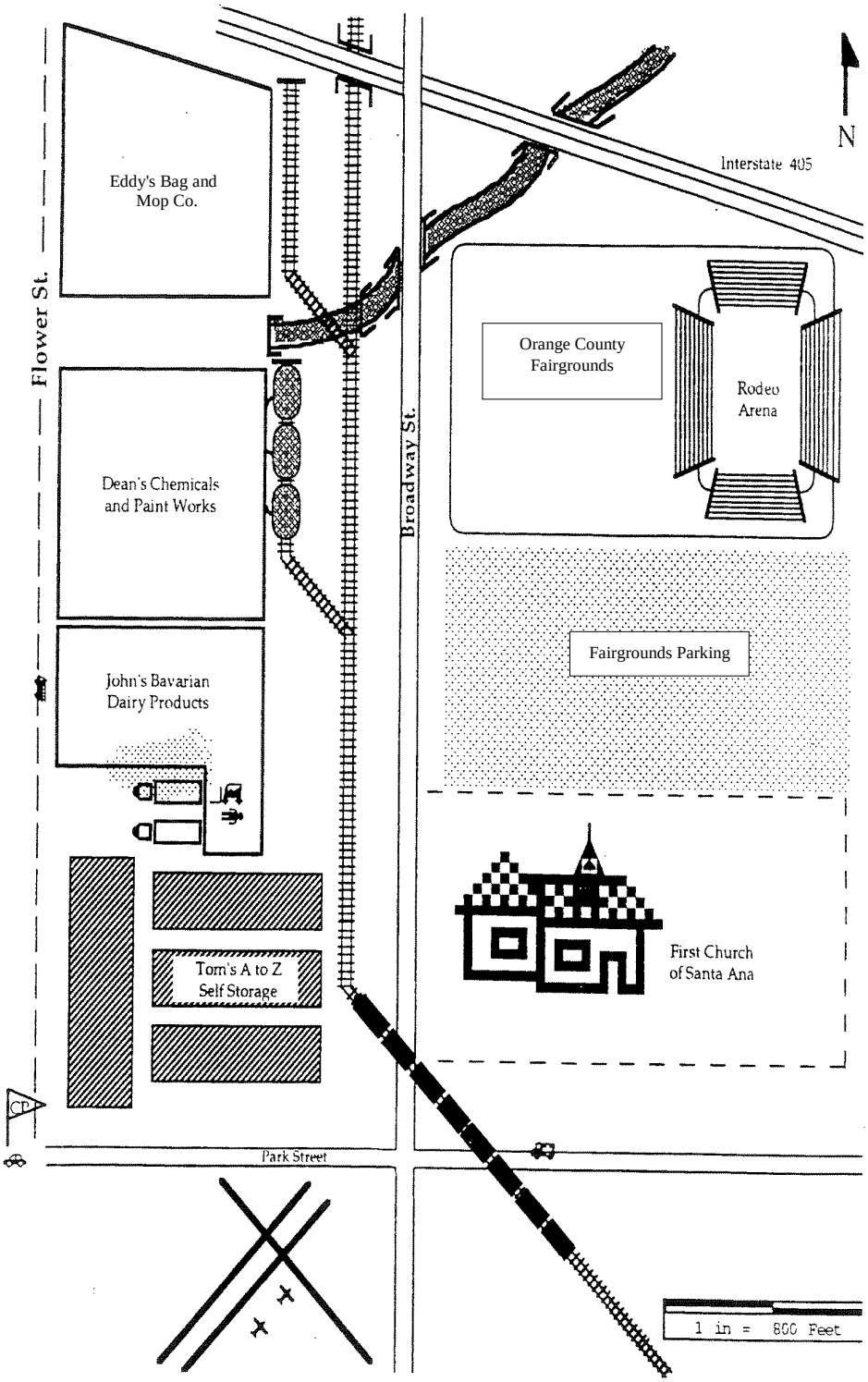
Resource Provider	Resource	Special Information
	Note: All full-time firefighters are certified EMTs (various levels), 68 career and 32 call members are certified in hazmat operations, and 42 career are certified at the technician level. All Rescue, Engine and Ladder 1 staff are technicians and receive bonus pay. Engine companies do Emergency Medical Services (EMS) first response for all life-threatening EMS calls. All members carry pagers for callback duty.	
Center City	**Public Works — total staff 87**	
	Street department, water department, parks department — also operate county sewage treatment plant	Dump trucks, snowplows, sand trucks, loaders, excavation equipment, barricades, and dewatering pumps
	Emergency Management/Planning Department — total staff 3	
		Maintain and support City Emergency Operations Center (EOC)
	American Red Cross — full-time staff 3, call staff of 12	
		Operate food services vehicle Negotiate contracts for emergency shelters
	Silver Cross Emergency Medical Services	
		1 advanced life support (ALS) and 1 BLS transport staffed daily
	Mercy Hospital	
		40-bed short-term care emergency room, operating room (minor surgery only), nearest trauma center 45 minutes
North Town	**Police Department — total staff 32 Sworn Officers**	
15-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 4 Sergeants, 1 Juvenile Officer, 25 Patrol Officers	Rehab bus/Command Post (CP) (15 passengers)
	Fire Department — total staff of 22 full time and 20 call members	
	1 Chief, 1 Assistant Chief, 1 Fire Prevention/Investigation/Training Officer Engine 1 — 1,750 gpm, 1,250 gal. tank (staffs 3) Engine 2 — 1,250 gpm, 1,000 gal. tank (staffs 2) Ladder 1 — 100-foot quint 1,500 gpm, 200 gal. tank (staffs 1) Reserve Engine 3 — 1,000 gpm, 1,000 gal. tank — not staffed	

Resource Provider	Resource	Special Information
	EMS provided by Silver Cross	
	Note: All staff hazmat operations trained and have a decontamination trailer.	
South Town	**Police Department — total staff 60 Sworn Officers, 14 Reservist (Peace Officers)**	
20-minute response time for on-duty resources	1 Chief, 1 Assistant Chief, 6 Shift Sergeants, 2 Juvenile Officers, 1 Training Officer, 50 Patrol Officers	
	Fire Department — total staff 38 career, 24 volunteer	
	1 Chief, 2 Assistant Chiefs, 1 Training Captain, 2 Fire Prevention/Public Ed, Fire Investigation	
	Engine 1 — 1,500 gpm, 1,000 gal. tank (staffs 4) Engine 2 — 1,500 gpm, 1,000 gal. tank (staffs 4) Ladder 1 — 100-foot articulated boom — no pump/water (staffs 2) Ambulance 1 — ALS level (staffs 2)	
	Note: All career are level 2 firefighters, hazmat technician certified, and EMS trained. Volunteers are mostly level 2 firefighters, hazmat operations, some EMS trained.	
Ridge County	**Public Works — total staff 62**	
	Typical highway department	
	Emergency Management	
30-minute response time for on-duty resources	Maintain and staff County EOC (staffs 15)	Operate County 911 dispatch center
	Health Department — total professional staff 34 including 14 RNs	
	Sheriff's Department — total staff of 67	
	Jail (staffs 24) Office/Booking/Evidence/etc. (staffs 8) Road patrol (staffs 30)	
State	**Police — typically 6 officers in county patrolling and other duties**	
	Can provide 45 officers with 3-hour notice	

Resource Provider	Resource	Special Information
	Highway Department — typically 20 workers in county	
	Can provide 45 workers with 3-hour notice	
	National Guard	
	Engineering Unit in Center City — normal staffing is 100. Today 60 are deployed.	
Other Resources	**Civil Support Team 007**	
	3-hour response time	
	Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)	
	3-hour response time	
	Federal Bureau of Investigation (FBI)	
	3-hour response time	
	Baldwin Level A Hazmat Team	
	2-hour response time (staffs 8 technicians)	
	Exeter Level B Hazmat/Decontamination	
	2-hour response time (staffs 8 technicians)	
	Private hazmat spill cleanup contractor	
	3- to 4-hour response time	

Activity 6.1 (cont'd)

Scenario Map



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Activity 6.1 (cont'd)

Size-Up Information Worksheet

Product(s): _____

Container(s): _____

Environment: _____

Other critical factors: _____

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Activity 6.1 (cont'd)

Strategic Goals/Incident Objectives Worksheet

Below are the typical strategic goals or items that may become incident objectives. Use this page to write Specific, Measurable, Achievable, Realistic and Timeframed (SMART) incident objectives for each strategic goal you wish to use.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Recovery/Termination:
Other incident objectives/goals:

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Activity 6.1 (cont'd)

Tactical Objectives Worksheet

For each incident objective/strategic goal identified on the Strategic Goals/Incident Objectives Worksheet, list the tactical objective you would use to accomplish that goal. The tactical objectives assigned should be within the scope of duty for the responders who will be assigned to them and within a standard of care.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Termination/Recovery:

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Activity 6.1 (cont'd)

Decontamination and Critical Safety Factors Worksheet

What decontamination measures will you employ before the responders take any action where they may be exposed to the product(s), and what, if any, decontamination measures would you take following the incident?

Critical safety factors for first responders:
Critical safety factors for people within the incident Hot Zone:
Critical safety factors for the public:
Other critical factors:

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Activity 6.1 (cont'd)

Risk Management Worksheet

For each safety issue identified for the incident, as the IC, what risk management measures would you initiate or have initiated?

Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
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Safety issue: Risk management measure to be applied:

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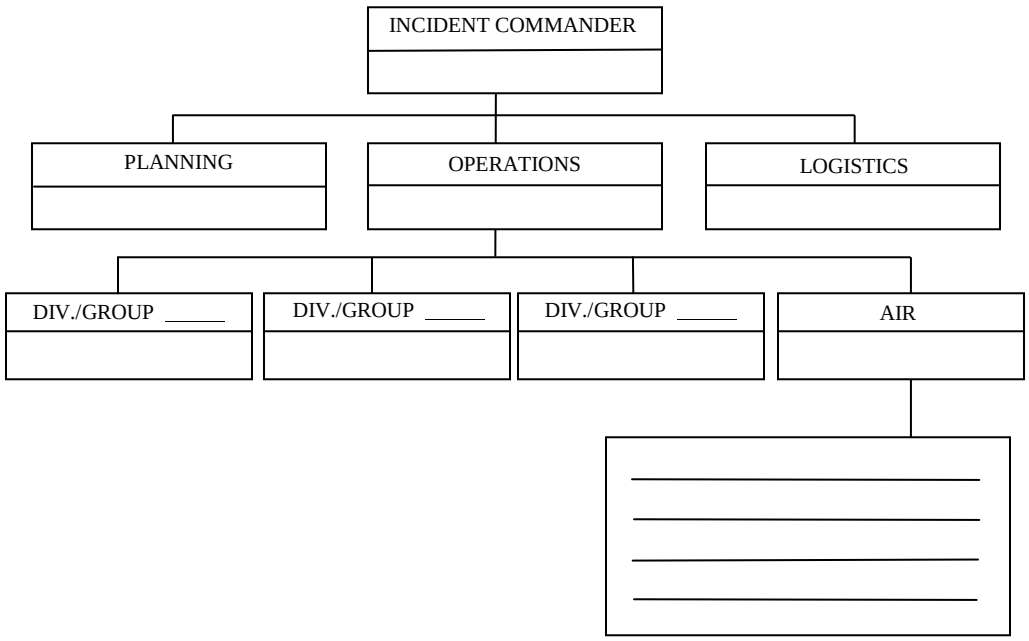
Activity 6.1 (cont'd)

ICS Form 201, Incident Briefing

INCIDENT BRIEFING	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. MAP SKETCH			
ICS 201 (12/93) **NFES 1325**	PAGE 1	5. PREPARED BY (NAME AND POSITION)	

6. SUMMARY OF CURRENT ACTIONS		
ICS 201 (12/93) **NFES 1325**	PAGE 2	

7. CURRENT ORGANIZATION



ICS 201 (12/93) **NFES 1325**	PAGE 3	

8. RESOURCES SUMMARY				
RESOURCES ORDERED	**RESOURCES IDENTIFICATION**	**ETA**	**ON SCENE √**	**LOCATION/ASSIGNMENT**
ICS 201 (12/93) NFES 1325	PAGE 4			

Activity 6.1 (cont'd)

ICS Form 202, Incident Objectives

INCIDENT OBJECTIVES	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. OPERATIONAL PERIOD (DATE/TIME)			
5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)			
6. WEATHER FORECAST FOR OPERATIONAL PERIOD			
7. GENERAL SAFETY MESSAGE			
8. ATTACHMENTS (√ IF ATTACHED) ☐ ORGANIZATION LIST (ICS 203) ☐ MEDICAL PLAN (ICS 206) ☐ _____ ☐ ASSIGNMENT LIST (ICS 204) ☐ INCIDENT MAP ☐ _____ ☐ COMMUNICATIONS PLAN (ICS 205) ☐ TRAFFIC PLAN ☐ _____			
202 ICS 3-80	9. PREPARED BY (PLANNING SECTION CHIEF)		10. APPROVED BY (INCIDENT COMMANDER)

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Activity 6.1 (cont'd)

ICS Form 203, Organization Assignment List

ORGANIZATION ASSIGNMENT LIST		1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
POSITION	NAME	4. OPERATIONAL PERIOD (DATE/TIME)		
5. INCIDENT COMMANDER AND STAFF				
INCIDENT COMMANDER		9. OPERATIONS SECTION		
DEPUTY		CHIEF		
SAFETY OFFICER		DEPUTY		
PUBLIC INFORMATION OFFICER		a. BRANCH I — DIVISION/GROUPS		
LIAISON OFFICER		BRANCH DIRECTOR		
6. AGENCY REPRESENTATIVES		DEPUTY		
AGENCY	NAME	DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		b. BRANCH II — DIVISION/GROUPS		
		BRANCH DIRECTOR		
7. PLANNING SECTION		DEPUTY		
CHIEF		DIVISION/GROUP		
DEPUTY		DIVISION/GROUP		
RESOURCES UNIT		DIVISION/GROUP		
SITUATION UNIT		DIVISION/GROUP		
DOCUMENTATION UNIT		DIVISION/GROUP		
DEMOBILIZATION UNIT		c. BRANCH III — DIVISION/GROUPS		
TECHNICAL SPECIALISTS		BRANCH DIRECTOR		
		DEPUTY		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
8. LOGISTICS SECTION		DIVISION/GROUP		
CHIEF		d. AIR OPERATIONS BRANCH		
DEPUTY		AIR OPERATIONS BR. DIR.		
a. SUPPORT BRANCH		AIR TACTICAL GROUP SUP.		
DIRECTOR		AIR SUPPORT GROUP SUP.		
SUPPLY UNIT		HELICOPTER COORDINATOR		
FACILITIES UNIT		AIR TANKER/FIXED-WING CRD.		
GROUND SUPPORT UNIT		10. FINANCE/ADMINISTRATION SECTION		
b. SERVICE BRANCH		CHIEF		
DIRECTOR		DEPUTY		
		TIME UNIT		
COMMUNICATIONS UNIT		PROCUREMENT UNIT		
MEDICAL UNIT		COMPENSATION/CLAIMS UNIT		
FOOD UNIT		COST UNIT		
203 ICS 1-82	11. PREPARED BY (RESOURCES UNIT)			

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Activity 6.1 (cont'd)

ICS Form 206, Medical Plan

MEDICAL PLAN	1. INCIDENT NAME	2. DATE PREPARED	1. TIME PREPARED	1. OPERATIONAL PERIOD

5. INCIDENT MEDICAL AID STATIONS

MEDICAL AID STATIONS	LOCATION	PARAMEDICS	
		YES	NO

6. TRANSPORTATION

A. AMBULANCE SERVICES

NAME	ADDRESS	PHONE	PARAMEDICS	
			YES	NO

B. INCIDENT AMBULANCES

NAME	LOCATION	PARAMEDICS	
		YES	NO

7. HOSPITALS

NAME	ADDRESS	TRAVEL TIME		PHONE	HELIPAD		BURN CENTER	
		AIR	GRND		YES	NO	YES	NO

8. MEDICAL EMERGENCY PROCEDURES

202 **ICS** 3-80	9. PREPARED BY (MEDICAL UNIT LEADER)	10. REVIEWED BY (SAFETY OFFICER)

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Activity 6.1 (cont'd)

ICS Form 208HM, Site Safety and Control Plan

SITE SAFETY AND CONTROL PLAN ICS 208 HM	1. Incident Name:	2. Date Prepared:	3. Operational Period Time

Section I. Site Information

4. Incident Location:

Section II. Organization

5. Incident Commander:	6. HM Group Supervisor:	7. Tech, Specialist — HM Reference:
8. Safety Officer:	9. Entry Leader:	10. Site Access Control Leader:
11. Asst. Safety Officer — HM:	12. Decontamination Leader:	13. Safe Refuge Area Mgr.
14. Environmental Health:	15.	16.

17. Entry Team: (Buddy System) Name:	PPE Level	18. Decontamination Element: Name:	PPE Level
Entry 1		Decon 1	
Entry 2		Decon 2	
Entry 3		Decon 3	
Entry 4		Decon 4	

Section III. Hazard/Risk Analysis

19. Material:	Container type	Qty.	Phys. State	pH	IDLH	F.P.	I.T.	V.P.	V.D.	S.G.	LEL	UEL

Comment:

Section IV. Hazard Monitoring

20. LEL Instrument(s):	21. O_2 Instrument(s):
22. Toxicity/PPM Instrument(s):	23. Radiological Instrument(s):

Comment:

Section V. Decontamination Procedures

24. Standard Decontamination Procedures:	YES:	NO:

Comment:

Section VI. Site Communications

25. Command Frequency:	26. Tactical Frequency:	27. Entry Frequency:

Section VII. Medical Assistance

28. Medical Monitoring:	YES:	NO:	29. Medical Treatment and Transport In-Place:	YES:	NO:

Comment:

ICS 208 HM **Page 1** **3/98**

Section VIII. Site Map

30. Site Map:



Weather ☐ Command Post ☐ Zones ☐ Assembly Areas ☐ Escape Routes ☐ Other ☐

Section IX. Entry Objectives

31. Entry Objectives:

Section X. SOPs and Safe Work Practices

32. Modifications to Documented SOPs or Work Practices:	YES:	NO:

Comment:

Section XI. Emergency Procedures

33. Emergency Procedures:

Section XII. Safety Briefing

34. Asst. Safety Officer — HM Signature:	Safety Briefing Completed (Time):
35. HM Group Supervisor Signature:	36. Incident Commander Signature:

Activity 6.1 (cont'd)

Orange County Fire Authority, Hazardous Materials Inventory Statement

ORANGE COUNTY FIRE AUTHORITY

Hazardous Materials Inventory Statement

- Please type or print legibly in black ink.
- If additional copies are necessary, this form may be reproduced.
- For line-by-line instructions, refer to the green colored pages of the disclosure packet.
- For assistance, contact the Disclosure Office at (714) 744-0463.

(1) ADD ☐ DELETE ☐ REVISE ☐

(2) PAGE 3 OF (3) 4

(4) BUSINESS NAME: John's Bavarian Dairy Products

(5) CHEMICAL LOCATION: Shop

(6) MAP #: 1

(7) GRID #: H 6

(8) CHEMICAL NAME: Isopropyl Alcohol

(9) COMMON NAME: Alcohol

(10) CAS #: 67630

(11) TRADE SECRET ☐ Y ☒ N

(12) EHS/Regulated Substance ☐ Y ☒ N
If EHS box is "Y" all amounts must also be in pounds

(13) FIRE CODE HAZARD CLASSES: 4B Flammable Liquid

(14) TYPE: PURE ☒ MIXTURE ☐ WASTE ☐

(17) PHYSICAL STATE: SOLID ☐ LIQUID ☒ GAS ☐

(15) RADIOACTIVE ☐ Y ☒ N

(16) CURIES:

(18) FEDERAL HAZARD CATEGORIES: FIRE ☒ REACTIVE ☐ PRESSURE RELEASE ☐ ACUTE HEALTH ☐ CHRONIC HEALTH ☐

(19) STATE WASTE CODE:

(20) DAYS ON SITE: 365

(21) LARGEST CONTAINER:

(22) UNITS: ☒ GAL ☐ CU FT ☐ LBS ☐ TONS

If an Extremely Hazardous Substance/Regulated Substance, amounts must also be in pounds

(23) MAX DAILY AMT: 10

(24) AVG DAILY AMT: 5

(25) ANNUAL WASTE AMT: 25

(26) STORAGE CONTAINER

A. ABOVEGROUND TANK	B. UNDERGROUND TANK	C. PRESSURIZED TANK	D. MAGAZINE	E. DRUM	F. PLASTIC CONTAINER
G. METAL CONTAINER	H. VAT	I. IN MACHINERY	J. ON TRUCK	K. BAG	L. BOX
M. CYLINDER	N. GLASS CONTAINER	O. VARIOUS	P. RAIL CAR	Q. SILO	R. TANK INSIDE BUILDING
S. CARBOY	T. TOTE BIN	U. TANK WAGON	V. OTHER		

(27) STORAGE PRESSURE: 1. AMBIENT (normal) ☒ 2. ABOVE AMBIENT (pressure) ☐ 3. BELOW AMBIENT (vacuum) ☐

(28) STORAGE TEMPERATURE: 4. AMBIENT (normal) ☒ 5. ABOVE AMBIENT (heated) ☐ 6. BELOW AMBIENT ☐ 7. CRYOGENIC ☐

(29) WT %	(30) HAZARDOUS COMPONENTS	(31) EHS	(32) CAS #
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	

(33) ADDITIONAL LOCALLY COLLECTED INFORMATION

(a) IS THIS MATERIAL OR ANY OF ITS COMPONENTS A CARCINOGEN? ☐ Y ☒ N (Refer to Attachment B)
(b) IS THIS MATERIAL PREPACKAGED FOR RETAIL SALE? ☐ Y ☒ N
(c) IS THIS MATERIAL A COMMERCIAL GRADE PESTICIDE? ☐ Y ☒ N

(d) IF THIS MATERIAL IS RADIOACTIVE, WHAT TYPE OF EMITTER IS IT? ALPHA ☐ BETA ☐ GAMMA ☐

(e) HOW IS THE MATERIAL DISPOSED OF? (Refer to Table #2, page 19 of the green pages) 02 Recycle

(f) IS A WASTE PRODUCED OR LEFT OVER AFTER PROCESSING? ☐ Y ☒ N

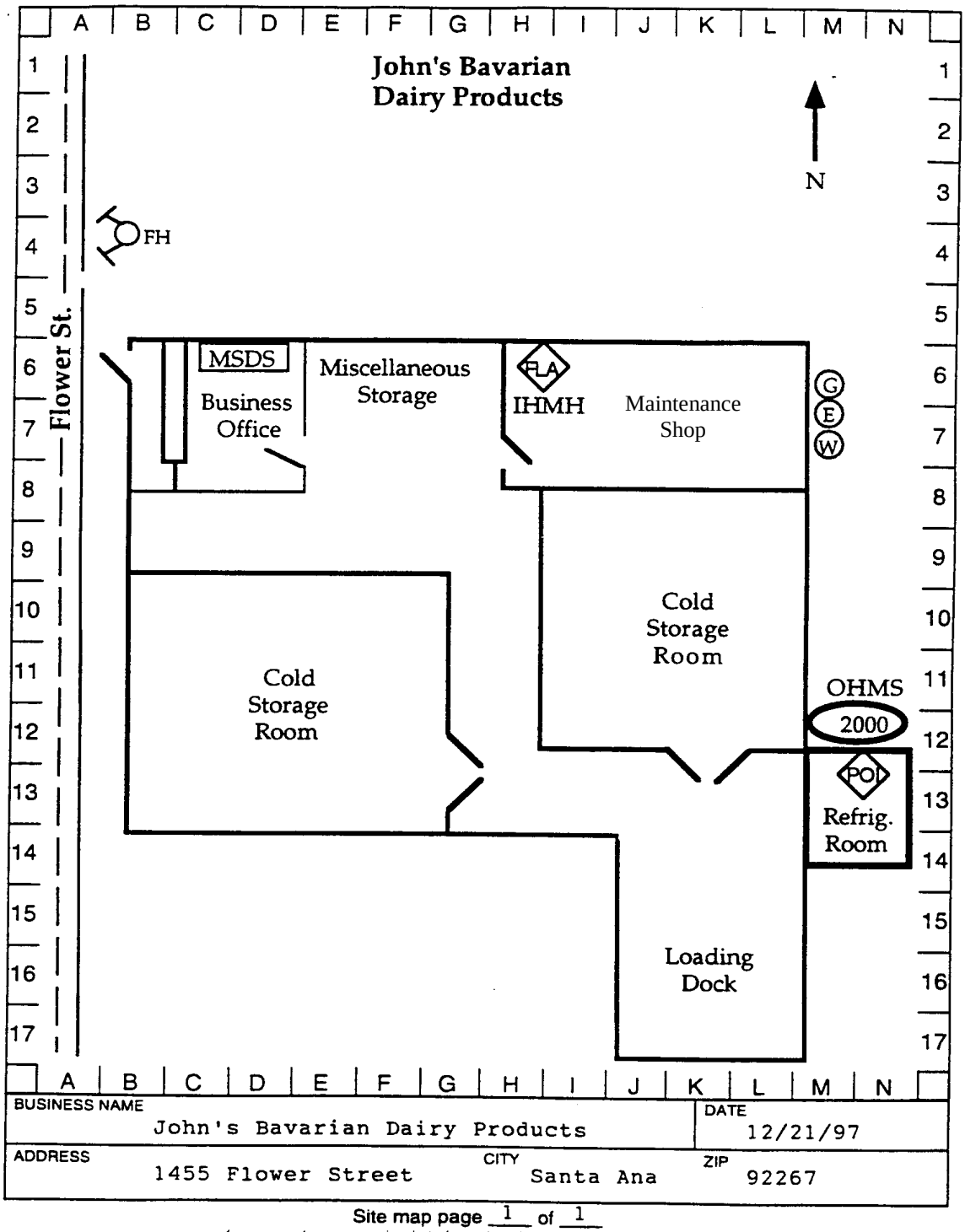
(g) HOW IS THE MATERIAL USED/WHAT IS THE MATERIAL USED FOR? Cleaner/Degreaser

FOR OFFICE USE ONLY: ☐ UNDER ☐ COMB ☐ EXEMPT | CARC EXP RAD HTX CGP RS | ☐ 1 ☐ 2 ☐ 3

Date of Print 5/97 Page 56 Part II

HAZARDOUS MATERIALS DISCLOSURE

Chemical Inventory and Business Emergency Plan



BUSINESS NAME	DATE
John's Bavarian Dairy Products	12/21/97

ADDRESS	CITY	ZIP
1455 Flower Street	Santa Ana	92267

Site map page 1 of 1

(page number you assign is to be entered on chemical inventory sheet)

HAZARDOUS MATERIALS DISCLOSURE Inspection # _____

Chemical Inventory and Business Emergency Plan

PART III — Business Emergency Plan (BEP)

Please read instructions (on green page 18) prior to completing this Business Emergency Plan.

This form shall be typed or printed legibly in black ink.

Keep a copy for your records and return the completed original forms, with Parts I and II, to:

Orange County Fire Authority
Hazardous Materials Disclosure Office (HMDO)
P.O. Box 86
Orange, CA 92856-0086

Mark the correct box:

- ☐ This is the first time I have filed a BEP.
- ☒ A BEP is required to be reviewed every two years. I am submitting my BEP to meet this requirement.
- ☐ There have been changes in my business operation and/or personnel and I am submitting a new BEP with the corrected information.

Business Name	John's Bavarian Dairy Products
Address	1455 Flower St. Santa Ana, Ca 92267
Business Owner	John S. Pond

I certify under penalty of law that I have personally examined and am familiar with the information submitted and believe the submitted information is true, accurate, and complete.

Print name of Owner/Operator	Signature	Date
John S. Pond		
Business Plan Prepared By	**Signature**	**Date**
Ida Finerstein		12/21/97

OFFICIAL USE ONLY: Insp. #	Issued	Reviewed By
Received	**Correction Required**	

HAZARDOUS MATERIALS DISCLOSURE

Chemical Inventory and Business Emergency Plan

1. Your business is required by State Law to provide immediate notification of any release or threatened release of a hazardous material to 1) local fire emergency response personnel, 2) the Office of Emergency Services (OES), and 3) this Administering Agency. If you have a release or threatened release of hazardous materials, immediately call:

Fire/Paramedics/Police/Sheriff
Phone: 911

Individual responsible for Calling 911:
Ida Finerstein

After the local emergency response personnel are notified, you shall then notify the Administering Agency (HMDO) and the Office of Emergency Services (24 hours/day):

State Office of Emergency Services: (800) 852-7550 or (916) 262-1621

AND:
Local Administering Agency: (714) 744-6699

Individual responsible for calling this Administering Agency and the State OES:
Ida Finerstein

2. List the local emergency medical facility that will be used by your business in the event of an accident or injury caused by a release or threatened release of hazardous materials.

Hospital/Clinic			
Santa Ana Community Hospital			
Address	**City**	**Zip Code**	**Phone Number**
120 Paine St.,	Santa Ana,	CA 92267	(714) 334 - 6777

3. **Does your business have a private on-site emergency response team?** ☐ Yes ☒ No

If yes, describe what policies and procedures your business will follow to notify your on-site emergency response team in the event of a release or threatened release of hazardous materials. (Attach additional pages if necessary.)

State law requires your business to complete all sections of the Emergency Response Procedure listed below. "N/A" is not acceptable.

4. Briefly describe your business's standard operating procedures in the event of a release or threatened release of hazardous materials:

   a. **Prevention** (prevent the hazard) — Describe the kinds of hazards associated with the materials present at your facility. What actions will your business take to **prevent** these hazards from occurring? Issues for discussion may include safety, storage, and containment procedures.

Ammonia leaks are the primary concern. Leak detectors are located in all cold storage rooms. Excess flow automatic valves are installed at three locations. Workers are alert.

HAZARDOUS MATERIALS DISCLOSURE

Chemical Inventory and Business Emergency Plan

b. **Mitigation** (reduce the hazard) — Describe what is done to **lessen** the harm or the damage to person(s), property, or the environment, and prevent what has occurred from getting worse or spreading. What is your immediate response to a spill, fire, explosion, or airborne release at your business?

If a need arises, the Ammonia can be dumped into the sewer and flushed with water. A manual operated sprinkler system surrounds the storage tank. Tank is diked also.

c. **Abatement** (remove the hazard) — Describe what you would do to **stop** and **remove** the hazard. How do you handle the complete process of stopping a release, cleaning up, and disposing of released materials at your facility? What aspects of the response are beyond your ability, and need to be handled by others?

If leak detected, remote shutoff valves, excess flow valves and system dump valves will be operated by plant workers.

Contents of diked area will be pumped off by cleanup company.

d. Describe how you will immediately notify and evacuate your facility. What communications or alarms are used? How will you operate these during power failure? Also specify emergency exits, alternatives, and staging areas.

Leak detectors will sound the alarm in the business office. A Public Address system will be used to notify workers to evacuate. Workers will evacuate to an upwind location one block from the plant.

e. Your business is required by State Law to keep a copy of this Business Plan, including the chemical inventory and Site Map (Part II of the packet). Describe where copies will be located at your business. Where will other copies be maintained?

The business plan with MSDS's will be kept in the business office on the desk accupied by the receptionist. A copy will kept at the office of Mr. John Pond (owner).

f. Describe where you keep other records required by this plan, such as employee training records (including drills), release report records, persons responsible for maintenance/safety and their records, and emergency phone lists.

All records are filed under Hazardous Materials in the business office file cabinet.

Employee Training Program

1. Describe the training your business conducts for all employees in safety procedures in the event of a release or threatened release of hazardous materials. By law, this training **shall include**, but not be limited to, the following: new employee training, annual training, periodic refresher courses, and familiarization with Section B (Emergency Plans and Procedures) of this Business Emergency Plan.

Each new employee receives orientation, 24 hour hazwoper, and confined space training to meet OSHA requirements. Each employee receives annual refresher training to meet OSHA requirements. At least annually each employee is required to conduct themselves under a simulated emergency situation.

Activity 6.1 (cont'd)

Material Safety Data Sheets

Printed: 12/08/1997 15:16:28

MATERIAL SAFETY DATA SHEET

Identity (As used on label and list)	Note: Blank fields are not permitted
ANHYDROUS AMMONIA	

Section I

Manufacturer's Name	Emergency Phone # (NIGHT)
Address	Information Phone #
City, State, Zip Code	Date Prepared 3-1-95

Section II - Hazardous Ingredients

Ingredient	Percent	CAS Number
AMMONIA	99.50	7664-41-7
Common Names and Synonyms: FORMULA NH3 P-GRADE 99.995		
PEL: 50 PPM	TLV: 25 PPM	
Other Limits Recommended: 35 PPM STEL		
Ingredient	Percent	CAS Number
WATER	0.40	7732-18-5
Common Names and Synonyms: FORMULA H20 P-GRADE 33PPM		
PEL: NONE	TLV: NONE	
Other Limits Recommended: NONE		

Section II continued on next page

Data Sheet For: ANHYDROUS AMMONIA Page 2
Manufactured By:
Report Printed: 12/08/1997 15:16:28

Section II - Hazardous Ingredients (continued)		
Ingredient	Percent	CAS Number
OIL	0.10	
Common Names and Synonyms		
NONE P-GRADE 2PPM		
PEL: NONE	TLV: NONE	
Other Limits Recommended: NONE		

Section III - Physical/Chemical Characteristics	
Boiling Point: -28.1 F	Specific Gravity: 0.62@60 F
Vapor Pressure: 4802.9(94PSI	Melting Point: -107.9F
Vapor Density: 0.60@32F	Evaporation Rate: NOT LISTED
SOLUBILITY IN WATER 15-30%(WT) @68 F	
APPEARANCE AND ODOR COLORLESS GAS OR COMPRESSED LIQUID WITH EXTREMELY PUNGENT ODOR. TRADE NAMES/SYNOMYMS: AMMONIA PRODUCT CODE: 5B81-83 TOXICOLOGICAL INFORMATION: IDLH LEVEL = 300PPM AMMONIA IS A STRONG ALKALI AND READILY DAMAGES ALL BODY TISSUES. AMMONIA IS NOT A CUMULATIVE METABOLIC POISON ECOLOGICAL INFORMATION: AQUATIC TOXICITY: 2.0-2.5 PPM/ 1-4 DAYS/GOLDFISH AND YELLOW PERCH/LC 60-80 PPM/3 DAYS/CRAWFISH LC100 8.2PPM/96HR/FATHEAD MINNOW/TLM WATERFOWL TOXICITY: 120PPM BIOCHEMICAL OXYGEN DEMAND: NOT PERTINENT FOOD CHAIN CONCENTRATION POTENTIAL: NONE	

Data Sheet For: ANHYDROUS AMMONIA Page 3
Manufactured By: I
Report Printed: 12/08/1997 15:16:28

Section IV - Fire And Explosion Hazard Data

Flash Point: N/A | Limits: Lel: 16% | Uel: 25%

EXTINGUISHING MEDIA

WITH A SOURCE OF IGNITION, AMMONIA WILL BURN IN THE RANGE OF 16-25% IN AIR. STOP FLOW OF GAS OR LIQUID.

SPECIAL FIREFIGHTING PROCEDURES

MOVE CONTAINERS FROM FIRE ZONE IF POSSIBLE, IF NOT, USE WATER TO COOL FIRE EXPOSED CONTAINERS. USE WATER SPRAY TO CONTROL VAPORS. DO NOT PUT WATER DIRECTLY ON LIQUID AMMONIA PERSONNEL MUST BE EQUIPPED WITH APPROPRIATE PROTECTIVE CLOTHING AND RESPIRATORY PROTECTION.

NFPA HAZARD CLASSIFICATION: HEALTH 3
FLAMMABILITY 1
REACTIVITY 0

UNUSUAL FIRE AND EXPLOSION HAZARDS

NONE LISTED

Section V - Reactivity Data

STABILITY: Stable

CONDITIONS TO AVOID

NOT APPLICABLE

INCOMPATABILITY (MATERIALS TO AVOID)

AMMONIA CAN REACT VIOLENTLY WITH STRONG ACIDS. UNDER CERTAIN CONDITIONS, AMMONIA REACTS WITH BROMINE, CHLORINE, FLUORINE OR IODINE TO FORM COMPOUNDS WHICH EXPLODE SPONTANEOUSLY. REACTIONS OF AMMONIA WITH GOLD, SILVER, OR MERCURY TO FORM EXPLOSIVE FULMINATE-LIKE COMPOUNDS HAVE BEEN REPORTED.

HAZARDOUS DECOMPOSITION PRODUCTS

HYDROGEN ON HEATING TO OVER 850F. THE DECOMPOSITION TEMPERATURE MAY BE LOWERED TO 575F BY CONTACT WITH CERTAIN METALS SUCH AS NICKEL.

HAZARDOUS POLYMERIZATION: Will Not Occur

Section V continued on next page

Data Sheet For: ANHYDROUS AMMONIA Page 4
Manufactured By:
Report Printed: 12/08/1997 15:16:28

Section V - Reactivity Data (continued)

CONDITIONS TO AVOID
NONE LISTED

Section VI - Health Hazard Data

CARCINOGENICITY	NTP?	IARC?	OSHA REGULATED
NO	NO	NO	NO

Effects and Hazards of Overexposure (Acute and Chronic)

EFFECTS AND HAZARDS OF EYE CONTACT
EXPOSURE TO LIQUID OR HIGH CONCENTRATIONS OF VAPOR CAN CAUSE PAINFUL, INSTANT AND POSSIBLY IRREVERSIBLE DAMAGE TO TISSUE SUCH AS THE CONJUNCTIVA, CORNEA AND LENS

ROUTES OF ENTRY: INHALATION, SKIN CONTACT, EYE CONTACT, INGESTION

EMERGENCY OVERVIEW: COLORLESS GAS OR COMPRESSED LIQUID WITH EXTREMELY PUNGENT ODOR.
LIQUID AMMONIA REACTS VIOLENTLY WITH WATER. VAPOR CLOUD IS PRODUCED. AVOID CONTACT WITH LIQUID AND VAPOR. STAY UPWIND AND USE WATER SPRAY TO "KNOCK DOWN" VAPOR. NOT FLAMMABLE UNDER CONDITIONS LIKELY TO BE ENCOUNTERED. STOP DISCHARGE IF POSSIBLE.

EFFECTS AND HAZARDS OF SKIN CONTACT
PROLONGED CONTACT WITH HIGH CONCENTRATIONS CAN CAUSE PAINFUL TISSUE DAMAGE, FROSTBITE AND SERIOUS CHEMICAL BURNS

ROUTES OF ENTRY: INHALATION, SKIN CONTACT, EYE CONTACT, INGESTION

EFFECTS AND HAZARDS OF INHALATION (BREATHING)
DEPENDING ON EXPOSURE CONCENTRATION AND DURATIONS, EFFECTS CAN VARY FROM NONE OR ONLY MILD IRRITATION, TO OBSTRUCTION OF BREATHING FROM LARYNGEAL AND BRONCHIAL SPASM, TO EDEMA AND SEVERE DAMAGE OF THE MUCOUS MEMBRANES OF THE RESPIRATORY TRACT WITH POSSIBLE FATAL RESULTS. LATENT EDEMA AND RESIDUAL REDUCTION IN PULMONARY FUNCTION MAY OCCUR

ROUTES OF ENTRY: INHALATION, SKIN CONTACT, EYE CONTACT,
(Continued on next page)

Section VI continued on next page

Data Sheet For: ANHYDROUS AMMONIA Page 5
Manufactured By:
Report Printed: 12/08/1997 15:16:28

Section VI - Health Hazard Data (continued)

EFFECTS AND HAZARDS OF INHALATION (BREATHING)(Cont.)
INGESTION.

EFFECTS AND HAZARDS OF INGESTION (SWALLOWING)
TISSUE DAMAGE, CHEMICAL BURNS, NAUSEA AND VOMITING CAN OCCUR AMMONIA IS A GAS UNDER NORMAL ATMOSPHERIC CONDITIONS AND INGESTION IS UNLIKELY

ROUTES OF ENTRY: INHALATION, SKIN CONTACT, EYE CONTACT, INGESTION

Emergency And First Aid Procedures

TREATMENT FOR EYE CONTACT
FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES THEN IMMEDIATELY SEEK MEDICAL AID.

TREATMENT FOR SKIN CONTACT
IMMEDIATELY FLUSH WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CLOTHING. CLOTHING FROZEN TO THE SKIN SHOULD BE THAWED WITH WATER BEFORE REMOVAL. SEEK IMMEDIATE MEDICAL AID

TREATMENT FOR INHALATION (BREATHING)
REMOVE FROM EXPOSURE. IF BREATHING HAS STOPPED OR IS DIFFICULT, ADMINISTER ARTIFICIAL RESPIRATION OR OXYGEN AS NEEDED. SEEK IMMEDIATE MEDICAL AID

TREATMENT FOR INGESTION (SWALLOWING)
DO NOT INDUCE VOMITING. HAVE THE VICTIM DRINK LARGE QUANTITIES OF WATER IF CONSCIOUS. IMMEDIATELY SEEK MEDICAL AID. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
RELEASE OF 100LBS OR MORE OF AMMONIA WITHIN 24 HOURS MUST BE IMMEDIATELY(WITHIN MINUTES) REPORTED TO THE NATIONAL RESPONSE CENTER AT 1-800-424-8802, AS WELL AS APPROPRIATE LOCAL AND STATE AGENCIES. SUGGESTED LOCAL ACTION: STOP LEAK IF FEASIBLE. AVOID BREATHING AMMONIA. EVACUATE PERSONNEL NOT EQUIPPED WITH PROTECTIVE CLOTHING AND EQUIPMENT. USE COPIOUS

(Continued on next page)

Section VII continued on next page

Data Sheet For: ANHYDROUS AMMONIA Page 6
Manufactured By:
Report Printed: 12/08/1997 15:16:28

Section VII - Precautions for Safe Handling and Use (continued)

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED(Cont.)
AMOUNTS OF WATER SPRAY OR FOG TO ABSORB AMMONIA VAPOR. DO NOT PUT WATER ON LIQUID AMMONIA. CONTAIN RUN-OFF TO PREVENT AMMONIA FROM ENTERING A STREAM, LAKE,SEWER, OR DITCH.

WASTE DISPOSAL METHOD
RECOVER AMMONIA IF FEASIBLE. OTHERWISE, LET AMMONIA EVAPORATE IF APPROPRIATE. ONLY PERSONNEL EXPERIENCED IN AMMONIA SPILLS SHOULD ADD WATER TO LIQUID AMMONIA. DISPOSE OF DILUTED AMMONIA AS A FERTILIZER OR IN AN INDUSTRIAL PROCESS.
FOR HAZARDOUS WASTE REGULATIONS CALL 1-800-424-9346, THE RCRA HOTLINE.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
REFER TO THE ANSI K61.1 STANDARD FOR STORAGE AND HANDLING INFORMATION. PROTECT CONTAINERS FROM PHYSICAL DAMAGE AND TEMPERATURES EXCEEDING 120F. USE ONLY APPROVED STORAGE SYSTEMS. ZINC, COPPER, SILVER, CADMIUM AND THEIR ALLOYS MUST NOT BE USED IN AMMONIA SYSTEMS SINCE THEY CAN BE RAPIDLY CORRODED BY IT. AVOID HYDROSTATIC PRESSURE, WHICH CAN CAUSE EQUIPMENT RUPTURE, BY ADHERING TO PROPER FILLING PROCEDURES AND THE USE OF HYDROSTATIC PRESSURE RELIEF VALVES WHERE APPROPRIATE.

OTHER PRECAUTIONS
NONE LISTED

TRANSPORT INFORMATION: PROPER SHIPPING NAME:
DOMESTIC SHIPMENTS:
PROPER SHIPPING NAME: AMMONIA, ANHYDROUS, LIQUEFIED
INTERNATIONAL SHIPMENTS: AMMONIA, ANHYDROUS, LIQUEFIED
DOT HAZARD CLASS: DOMESTIC (2.2)
INDENTIFICATION NUMBER: DOMESTIC (UN1005)
PACKING GROUP: DOMESTIC (NONE)
DOT HAZARD CLASS: INTERNATIONAL (2.3)
INDENTIFICATION NUMBER: INTERNATIONAL (UN1005)
PACKING GROUP: INTERNATIONAL (NONE)

Section VIII - Control Measures

RESPIRATORY PROTECTION
RESPIRATORY PROTECTION APPROVED BY NIOSH/MSHA FOR AMMONIA MUST BE USED WHEN EXPOSURE LIMITS ARE EXCEEDED. WHETHER A CHEMICAL CARTRIDGE RESPIRATOR OR A SELF-CONTAINED BREATHING APPARATUS IS SUFFICIENT FOR EFFECTIVE RESPIRATORY PROTECTION DEPENDS ON THE TYPE AND MAGNITUDE OF EXPOSURE

Data Sheet For: ANHYDROUS AMMONIA Page 7
Manufactured By: I
Report Printed: 12/08/1997 15:16:28

Section VIII - Control Measures (continued)

Ventilation

LOCAL EXHAUST VENTILATION
LOCAL POSITIVE PRESSURE AND/OR EXHAUST VENTILATION SHOULD BE USED TO REDUCE VAPOR CONCENTRATIONS IN CONFINED SPACES. AMMONIA VAPOR, BEING LIGHTER THAN AIR, CAN BE EXPECTED TO DISSIPATE TO THE UPPER ATMOSPHERE. AMMONIA CONCENTRATIONS MAY ALSO BE REDUCED BY THE USE OF AN APPROPRIATE ABSORBENT OR REACTANT MATERIAL

SPECIAL VENTILATION
NONE LISTED

MECHANICAL (GENERAL) VENTILATION
NONE LISTED

OTHER VENTILATION
NONE LISTED

PROTECTIVE GLOVES
RUBBER GLOVES AND RUBBER OR OTHER TYPES OF APPROVED PROTECTIVE CLOTHING SHOULD BE USED TO PREVENT SKIN CONTACT A FACE SHIELD SHOULD BE USED FOR INCREASED PROTECTION FROM CONTACT WITH LIQUID

EYE PROTECTION
CHEMICAL SPLASH GOGGLES, APPROVED FOR USE WITH AMMONIA, MUST BE WORN TO PREVENT EYE CONTACT WITH LIQUID OR VAPOR. A FACE SHIELD SHOULD BE USED FOR INCREASED PROTECTION FROM CONTACT WITH LIQUID

OTHER PROTECTIVE EQUIPMENT
EMERGENCY EYE WASH STATIONS AND DELUGE SAFETY SHOWERS MUST BE AVAILABLE IN THE WORK AREA. POST A LIST OF EMERGENCY RESPONSE CONTACTS AND TELEPHONE NUMBERS

REGULATORY INFORMATION:
NOTICE: THIS PRODUCT IS SUBJECT TO THE REPORTING REQUIREMENT OF SARA (1986, SECTION 313 OF TITLE III). OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200: AMMONIA IS CONSIDERED A HAZARDOUS CHEMICAL
TOXIC SUBSTANCE CONTROL ACT: THIS MATERIAL IS LISTED IN THE TSCA INVENTORY.
EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT (SARA, TITLE III). SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE: YES

(Continued on next page)

Section VIII continued on next page

Data Sheet For: ANHYDROUS AMMONIA Page 8
Manufactured By
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Section VIII - Control Measures (continued)

OTHER PROTECTIVE EQUIPMENT(Cont.)
SECTION 311/312 HAZARDOUS CATAGORIES: IMMEDIATE (ACUTE) HEALTH HAZARDS SECTION 313 TOXIC CHEMICAL: YES
CERCLA/SUPERFUND, 40 CFR 117,302: THIS PRODUCT CONTAINS AMMONIA WHICH IF RELEASED TO THE ENVIRONMENT IN QUANTITIES OF 100LBS OR MORE REQUIRES NOTIFICATION TO THE NATIONAL RESPONSE CENTER IN WASHINGTON, DC AT 1-800-424-8802.

WORK AND HYGIENIC PRACTICES
NONE LISTED

REGULATORY INFO.(CONT)
WHMIS: ONE PERCENT (1%)
CALIFORNIA PROPOSITION 65: REPRODUCTIVE: NO CARCINOGEN: NO
OSHA PROCESS SAFETY MANAGEMENT, 29 CFR 1910.119: THIS PRODUCT IS SUBJECT TO THE PROCESS SAFETY MANAGEMENT REQUIREMENTS OF 29 CFR 1910.119 IF MAINTAINED ON-SITE IN QUANTITIES OF 10,000 LBS. OR GREATER.
EPA CHEMICAL ACCIDENT RELEASE PREVENTION, 40CFR PART 68: THIS PRODUCT IS SUBJECT TO THE RISK MANAGEMENT PLAN REQUIREMENTS OF 40 CFR PART 68 IF MAINTAINED ON-SITE IN QUANTITIES OF 10,000 LBS OR GREATER.

OTHER INFORMATION: NEW FORMAT IDLA REDUCED FROM 500PPM TO 300 PPM. SUPERSEDES MSDS CODE NO. 5B81-83 DATED 2/94

Product's ID #: 31110 Printed: 12/08/1997 15:21:43

MATERIAL SAFETY DATA SHEET

Identity (As used on label and list)	Note: Blank fields are not permitted
ISOPROPYL ALCOHOL	

Section I

Manufacturer's Name	Emergency Phone #
?	
Address	Information Phone #
City, State, Zip Code	Date Prepared
	02-12-90

Section II - Hazardous Ingredients

Ingredient	Percent	CAS Number
ISOPROPYL ALCOHOL	100.00	67-63-0

Common Names and Synonyms

PEL: 400 PPM	TLV: ACGIH/TWA 400 PPM

Other Limits Recommended: TLV/STEL 500 PPM

Section III - Physical/Chemical Characteristics

Boiling Point: 180 F	Specific Gravity: .79
Vapor Pressure: 33 C 68 F	Melting Point: -127 F
Vapor Density: 2.1	Evaporation Rate: 1.4

SOLUBILITY IN WATER
COMPLETE

Section III continued on next page

Data Sheet For: ISOPROPYL ALCOHOL Page 2
Manufactured By: [illegible]
Report Printed: 12/08/1997 15:21:43

Section III - Physical/Chemical Characteristics (continued)

APPEARANCE AND ODOR
COLORLESS, MOBILE LIQUID. MILD ODOR.

Section IV - Fire And Explosion Hazard Data

Flash Point: 53 F	Limits: Lel: 2	Uel: 12

EXTINGUISHING MEDIA
USE WATER FOG, "ALCOHOL " FOAM, DRY CHEMICAL OR CO2.

SPECIAL FIREFIGHTING PROCEDURES
WARNING. FLAMMABLE. CLEAR FIRE AREA OF UNPROTECTED PERSONNEL DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS). INCLUDING A POSITIVE PRESURE NIOSH APPROVED SELF-CONTAININED BREATHING APPARATUS. COOL FIRE EXPOSE CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS
CONTAINERS EXPOSED TO INTENSE HEAT FROM FIRES SHOULD BE COOLED WITH WATER TO PREVENT VAPOR PRESSURE BUILDUP WHICH COULD RESULT IN CONTAINER RUPTURE. CONTAINER AREAS EXPOSED TO DIRECT FLAME CONTACT SHOULD BE COOLED WITH LARGE QUANTITIES OF WATER AS NEEDED TO PREVENT WEAKENING OF CONTAINER STRUCTURE.

Section V - Reactivity Data

STABILITY: Stable

CONDITIONS TO AVOID
AVIOD HEAT, SPARKS, FLAME AND CONTACT WITH STRONG OXIDIZING AGENTS. DO NOT STORE OR HANDLE IN ALUMINUM EQUIPMENT AT TEMPERATURES ABOVE 120 DEG. F.

INCOMPATABILITY (MATERIALS TO AVOID)
NOT LISTED

HAZARDOUS DECOMPOSITION PRODUCTS
(Continued on next page)

Section V continued on next page

Data Sheet For: ISOPROPYL ALCOHOL Page 3
Manufactured By:
Report Printed: 12/08/1997 15:21:43

Section V - Reactivity Data (continued)

HAZARDOUS DECOMPOSITION PRODUCTS(Cont.)
CARBON MONOXIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED DURING COMBUSTION.

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID
NOT LISTED

Section VI - Health Hazard Data

CARCINOGENICITY	NTP?	IARC?	OSHA REGULATED
NOT LISTED	NOT LISTED	NOT LISTED	NOT LISTED

Effects and Hazards of Overexposure (Acute and Chronic)

EFFECTS AND HAZARDS OF EYE CONTACT
MODERATELY IRRITATING TO THE EYES.

EFFECTS AND HAZARDS OF SKIN CONTACT
MILDLY IRRITATING TO THE SKIN

EFFECTS AND HAZARDS OF INHALATION (BREATHING)
MAY CAUSE MILD IRRITATION TO THE NOSE. THROAT AND RESPIRATORY TRACT AND MAY RESULT IN CENTRAL NERVOUS SYSTEM (CNS) DEPRESSION.

EFFECTS AND HAZARDS OF INGESTION (SWALLOWING)
GENERALLY CONSIDERED TO HAVE A LOW ORDER OF ACUTE ORAL TOXICITY.
SIGNS AND SYMPTOMS: IRRITATION AS NOTED ABOVE. EARLY TO MODERATE CNS DEPRESSION MAY BE EVIDENCED BY GIDDINESS. HEADACHE, DIZZINESS, AND NAUSEA.

Emergency And First Aid Procedures

TREATMENT FOR EYE CONTACT
IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

TREATMENT FOR SKIN CONTACT
FLUSH SKIN WITH WATER. IF IRRITATION OCCURS, GET MEDICAL
(Continued on next page)

Section VI continued on next page

Data Sheet For: ISOPROPYL ALCOHOL Page 4
Manufactured By
Report Printed: 12/08/1997 15:21:43

Section VI - Health Hazard Data (continued)

TREATMENT FOR SKIN CONTACT(Cont.)
ATTENTION.

TREATMENT FOR INHALATION (BREATHING)
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

TREATMENT FOR INGESTION (SWALLOWING)
DO NOT GIVE LIQUIDS IF VICTIM IS UNCONSICIOUS OR VERY DROWSY. OTHERWISE, GIVE NO MORE THAN 2 GLASSES OF WATER AND INDUCE VOMITING BY GIVING 30CC (2 TABLESPOONS) SYRUP OF IPECAC IS UNAVAILABLE. GIVE 2 GLASSES OF WATER AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF VICTIM'S THROAT. KEEP VICTIM'S HEAD BELOW HIPS WHILE VOMITING. GET MEDICAL ATTENTION.
NOTE TO PHYSICIAN: IF VICTIM IS A CHILD. GIVE NO MORE THAN 1 GLASS OF WATER AND 15CC (1 TABLESPOON) SYRUP OF IPECAC. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMISIS, GASTRIC LAVAGE SHOULD BE CONSIDERED FOLLOWING INTUBATION WITH A CUFFED ENDOTRACHEAL TUBE.

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
WARNING. FLAMMABLE. ELIMATE ALL IGNITION SOURCES. HANDLING EQUIPMENT MUST BE GROUNDED TO PREVENT SPARKING.
LARGE SPILLS: EVACUATE THE HAZARD AREA OF UNPROTECTED PERSONAL. WEAR APPROPRIATE RESPIRATOR AND PROTECTIVE CLOTHING SHUT OFF SOURCE OF LEAK ONLY IF SAFE TO DO SO. DIKE AND CONTAIN. IF VAPOR CLOUD FORMS, WATER FOG MAY BE USED TO SUPRESS; CONTAIN RUN-OFF. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL; PLACE IN NON-LEAKING CONTAINERS FOR PROPER DISPOSAL. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE; DISPOSE OF FLUSH SOLUTION ABOVE.
SMALL SPILLS: TAKE UP WITH AN ABSORBENT MATERIAL AND PLACE IN NON-LEAKING CONTAINERS; SEAL TIGHTLY FOR PROPER DISPOSAL.

WASTE DISPOSAL METHOD
NOT LISTED

Section VII continued on next page

Data Sheet For: ISOPROPYL ALCOHOL Page 5
Manufactured By: [illegible]
Report Printed: 12/08/1997 15:21:43

Section VII - Precautions for Safe Handling and Use (continued)

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
NOT LISTED

OTHER PRECAUTIONS
KEEP LIQUID VAPOR AWAY FROM HEAT, SPARKS AND FLAME, SURFACES THAT ARE SUFFICIENTLY HOT MAY IGNITE EVEN LIQUID PRODUCT IN THE ABSENCE OF SPARKS OR FLAME. EXTINGUISH PILOT LIGHTS, CIGARETTES AND TURN OFF OTHER SOURCES OF IGNITION PRIOR TO USE AND UNTIL ALL VAPORS ARE GONE.
VAPORS MAY ACCUMULATE AND TRAVEL TO IGNITION DISTANT FROM THE HANDLING SITE; FLASH-FIRE CAN RESULT. KEEP CONTAINERS CLOSED WHEN NOT IN USE. USE WITH ADEQUATE VENTILATION. CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPITIED. CAN CONTAIN EXPLOSIVE VAPORS. DO NOT CUT, DRILL, GRIND, WELD, OR PERFORM SIMILAR OPERATIONS ON OR NEAR CONTAINERS. STATIC ELECTRICITY MAY ACCUMULATE AND CREATE A FIRE HAZARD. GROUND FIXED EQUIPMENT. BOND AND GROUND TRANSFER CONTAINERS AND EQUIPMENT WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USIN TOILET FACILITIES. LAUNDER SONTAMINATED CLOTHING BEFORE REUSE.
DO NOT STORE OR HANDLE IN ALUMINUM EQUIPMENT AT TEMPERTURES ABOVE 120 DEG. F.

Section VIII - Control Measures

RESPIRATORY PROTECTION
IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OF AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.
USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS.

Ventilation

LOCAL EXHAUST VENTILATION
NOT LISTED

SPECIAL VENTILATION

(Continued on next page)

Section VIII continued on next page

Data Sheet For: ISOPROPYL ALCOHOL Page 6
Manufactured By: [illegible] IPANY
Report Printed: 12/08/1997 15:21:43

Section VIII - Control Measures (continued)

SPECIAL VENTILATION(Cont.)
NOT LISTED

MECHANICAL (GENERAL) VENTILATION
NOT LISTED

OTHER VENTILATION
NOT LISTED

PROTECTIVE GLOVES
AVIOD PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR CHEMICAL RESISTANT GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT. TEST DATA FROM PUBLISHING LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURES INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE, NEOPRENE AND NATURAL RUBBER GLOVES.

EYE PROTECTION
AVIOD CONTACT WITH EYES. WEAR CHEMICAL GOGGLES IF THERE IS LIKELIHOOD OF CONTACT WITH EYES.

OTHER PROTECTIVE EQUIPMENT
USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS. EYE WASH FOUNTAINS AND SAFETY SHOWERS SHOULD BE AVAILABLE FOR EMERGENCY USE.

WORK AND HYGIENIC PRACTICES
NOT LISTED

Activity 6.2

Dean's Chemical and Paint Works Incident, Part 1

Purpose

To apply the appropriate strategic goals on an incident involving one or more hazardous materials and determine appropriate tactical objectives. The response will involve first responders trained to the awareness level, operations level, technician level, and on-scene Incident Command level. This incident will require the use of resources outside the community where the incident occurs.

Directions

1. Review the material provided for Dean's Chemicals and Paint Works Incident, Part 1 and other nearby facilities.

2. Review the resources for Center City (your town) and neighboring communities that are available under your mutual-aid agreement.

3. Complete the following assignments:

    a. Determine critical size-up factors. Complete Size-Up Information Worksheet.

    b. Determine which hazmat strategic goals are to be used. Complete Strategic Goals/Incident Objectives Worksheet.

    c. Determine what tactical objectives would be appropriate to meet the selected strategic goals. Complete Tactical Objectives Worksheet.

    d. Determine what decontamination measures are appropriate. Complete Decontamination and Critical Safety Factors Worksheet.

    e. Evaluate critical safety issues that are present and determine what risk management measures you will implement. Complete Risk Management Worksheet.

    f. Complete ICS Forms 201, 202, 203, 206 and 208HM.

4. Diagram your incident management structure on an easel pad.

5. Select a representative to explain how you managed the incident.

Scenario

It is now 8:30 a.m., and as you are terminating the incident at John's, you learn that a city water tank failed about 1/4 mile upstream near Santiago Creek. Over 1 million gallons of water rapidly flowed downstream around 3 a.m. today. While the city closed Broadway Street to traffic, it did not notify the railroad. When the water rushed down Santiago Creek, it washed out a small bridge that supported the rail lines of the BN and SF railroad. A short time later, a train crew was attempting to place two rail tank cars of ethylene oxide on a siding at Eddy's Bag and Mop Co. As they traveled the rail line adjacent to the siding used by Dean's Chemicals and Paint Works, the two cars being delivered to Eddy's tipped onto the cars at Dean's. The rail cars at Dean's are connected to piping that enters the facility and are used for product storage. The railroad brought in a crane to stand up the two tipped cars and remove them.

As you are learning about the washout and rail car incident, a railroad worker runs up to your Command vehicle yelling that two of his coworkers were walking near the tipped rail cars and are now complaining of burning skin, headache, nausea, vomiting and difficulty breathing. These symptoms coincide with those of three railroad workers brought to the hospital by private vehicle today. When the BLS ambulance transported the workers from John's, the emergency room doctor asked if they had any insight as to the cause of the symptoms of the three workers being treated. The EMS personnel stated that they did not have any knowledge of any incident or chemical release and informed the IC when they returned to the scene. The symptoms of the two at the scene and the three in the hospital appear connected.

The injured railroad workers appear dazed and unable to communicate and respond when told over the public-address (PA) system to walk to your location. They are seated down near the overturned rail cars and appear nauseous.

Dispatch informs you that the parks department is reporting a large number of dead fish suddenly floating on the lake at the State Wildlife Preserve about 3/4 of a mile south of your location. This is the termination point of Santiago Creek.

Employees of Dean's have been unable to enter their facility due to having Flower Street closed and are awaiting the opening of the street. Employees of Eddy's entered via an alley and have opened for the day. There are 40 employees working in Eddy's at the current time. There are two tractor-trailers waiting to go to Eddy's to pick up goods. Since you were unaware of the rail incident, you allowed the 4-H to enter and occupy the fairgrounds for its annual livestock show. While there are currently about 100 youths and adults present, there are expected to be 500 by 10 a.m. The First Church of Santa Ana has a day care center located in the basement, and there are an estimated 20 children from ages of 2 to 5 and five adults present. The wind is currently blowing around 5 mph from west to southeast.

The lieutenant from Rescue 1, who is your most senior hazmat technician, reports that she used her binoculars and observed a liquid on the ground in the vicinity of the tank cars but cannot determine where it is coming from. It appears to be flowing into Santiago Creek. She believes the three rail cars at Dean's appear to be 90,000-gallon low-pressure cars, and the two cars that have tipped over into the stationary cars are smaller, high-pressure cars.

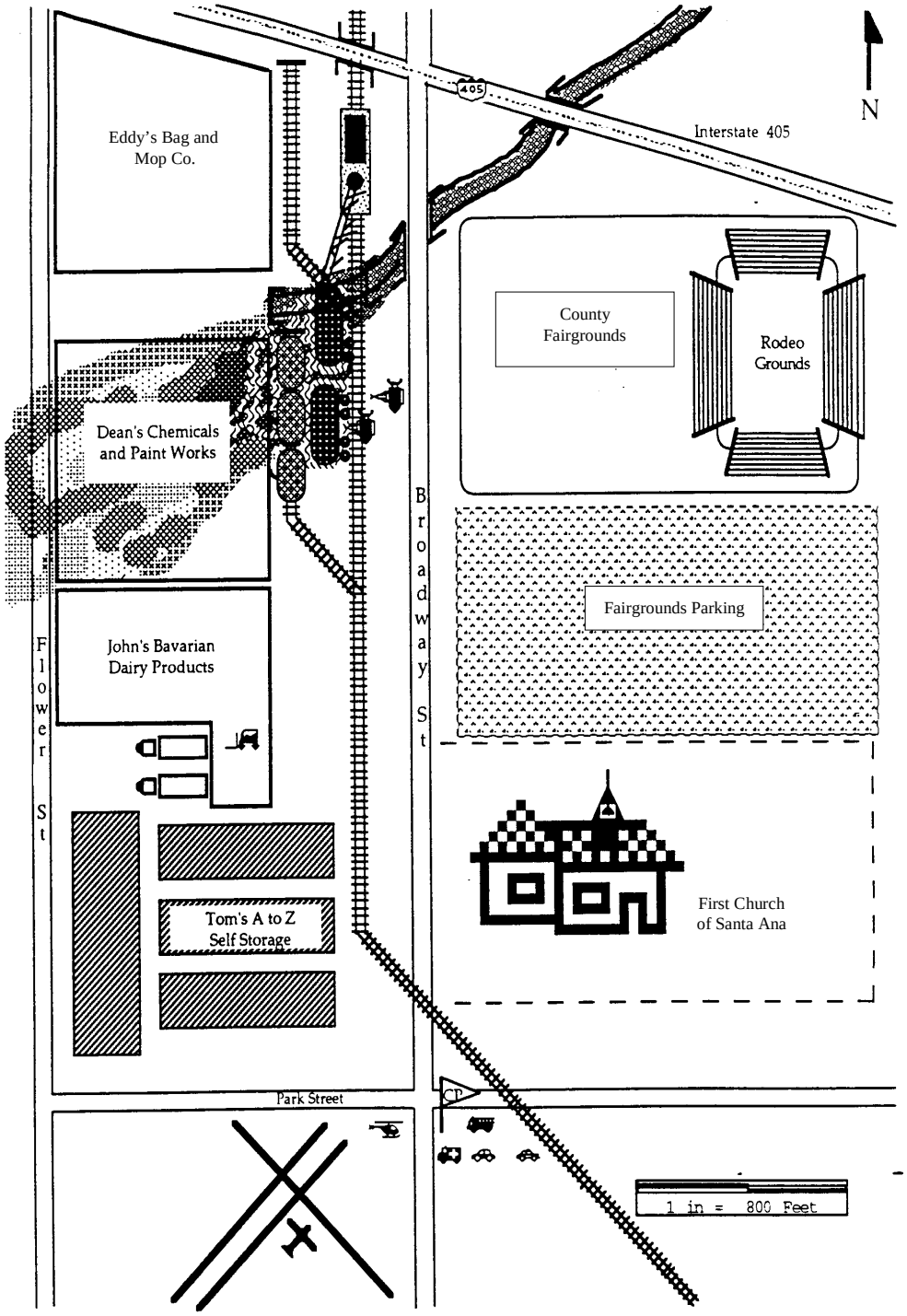
Your group is to take the role of IC and, if deemed appropriate, initiate a Unified Command (UC) structure. You will be the lead agency until the leak is stopped and the incident becomes stabilized.

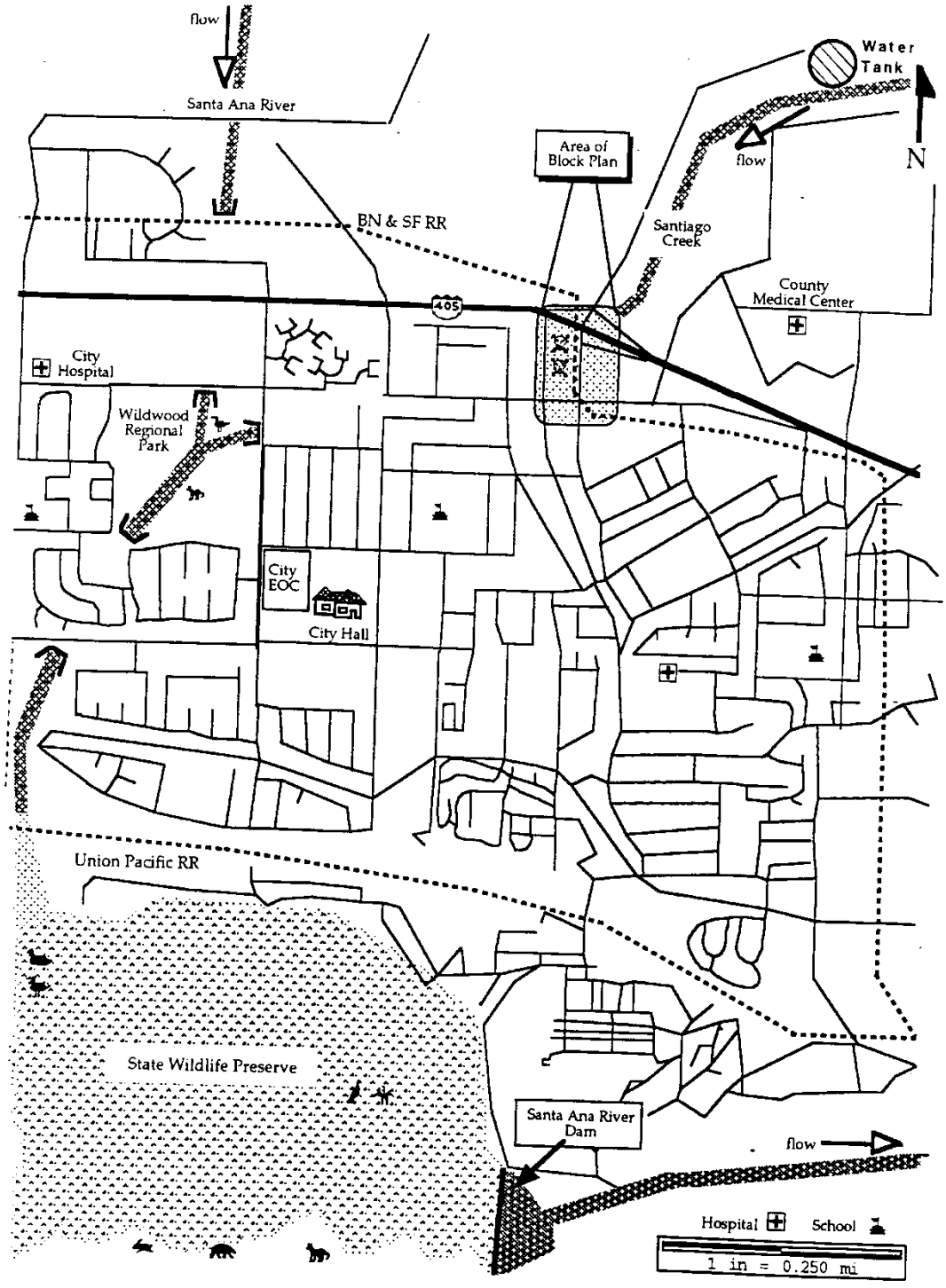
All the resources available are provided on the resource inventory.

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Activity 6.2 (cont'd)

Scenario Map




flow
Santa Ana River
Water Tank
Area of Block Plan
flow
N
BN & SF RR
Santiago Creek
405
County Medical Center
City Hospital
Wildwood Regional Park
City EOC
City Hall
Union Pacific RR
State Wildlife Preserve
Santa Ana River Dam
flow
Hospital
School
1 in = 0.250 mi

Activity 6.2 (cont'd)

Size-Up Information Worksheet

Product(s): _____

Container(s): _____

Environment: _____

Other critical factors: _____

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Activity 6.2 (cont'd)

Strategic Goals/Incident Objectives Worksheet

Below are the typical strategic goals or items that may become incident objectives. Use this page to write SMART incident objectives for each strategic goal you wish to use.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Recovery/Termination:
Other incident objectives/goals:

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Activity 6.2 (cont'd)

Tactical Objectives Worksheet

For each incident objective/strategic goal identified on the Strategic Goals/Incident Objectives Worksheet, list the tactical objective you would use to accomplish that goal. The tactical objectives assigned should be within the scope of duty for the responders who will be assigned to them and within a standard of care.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Termination/Recovery:

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Activity 6.2 (cont'd)

Decontamination and Critical Safety Factors Worksheet

What decontamination measures will you employ before the responders take any action where they may be exposed to the product(s), and what, if any, decontamination measures would you take following the incident?

Critical safety factors for first responders:
Critical safety factors for people within the incident Hot Zone:
Critical safety factors for the public:
Other critical factors:

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Activity 6.2 (cont'd)

Risk Management Worksheet

For each safety issue identified for the incident, as the IC, what risk management measures would you initiate or have initiated?

Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:

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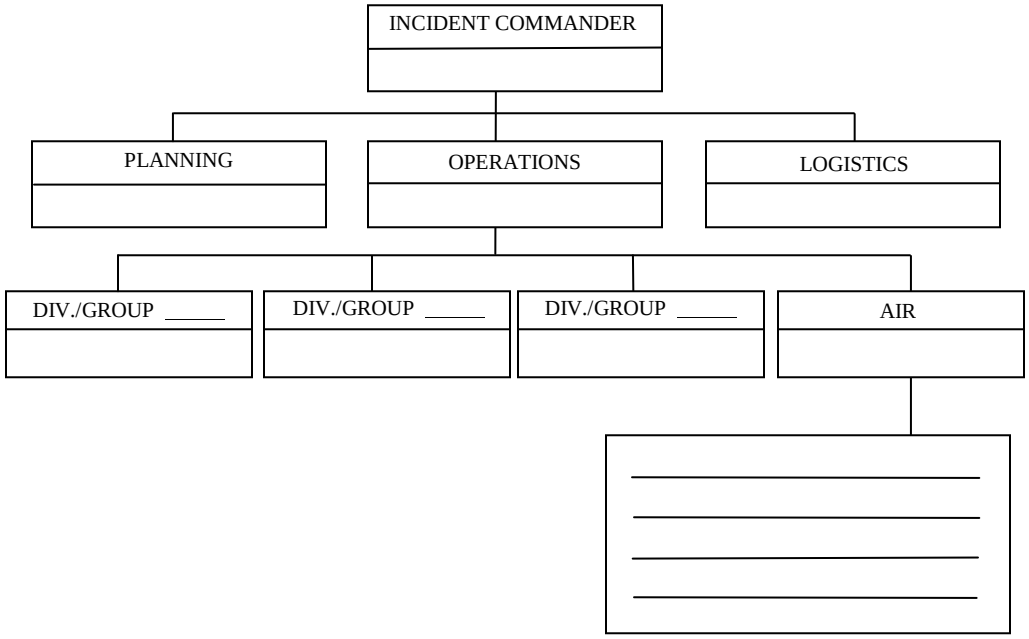
Activity 6.2 (cont'd)

ICS Form 201, Incident Briefing

INCIDENT BRIEFING	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. MAP SKETCH			
ICS 201 (12/93) **NFES 1325**	PAGE 1	5. PREPARED BY (NAME AND POSITION)	

6. SUMMARY OF CURRENT ACTIONS		

7. CURRENT ORGANIZATION



ICS 201 (12/93) **NFES 1325**	PAGE 3	

8. RESOURCES SUMMARY				
RESOURCES ORDERED	**RESOURCES IDENTIFICATION**	**ETA**	**ON SCENE √**	**LOCATION/ASSIGNMENT**
ICS 201 (12/93) NFES 1325	PAGE 4			

Activity 6.2 (cont'd)

ICS Form 202, Incident Objectives

INCIDENT OBJECTIVES	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. OPERATIONAL PERIOD (DATE/TIME)			
5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)			
6. WEATHER FORECAST FOR OPERATIONAL PERIOD			
7. GENERAL SAFETY MESSAGE			
8. ATTACHMENTS (√ IF ATTACHED) ☐ ORGANIZATION LIST (ICS 203) ☐ MEDICAL PLAN (ICS 206) ☐ _____ ☐ ASSIGNMENT LIST (ICS 204) ☐ INCIDENT MAP ☐ _____ ☐ COMMUNICATIONS PLAN (ICS 205) ☐ TRAFFIC PLAN ☐ _____			
202 ICS 3-80	9. PREPARED BY (PLANNING SECTION CHIEF)		10. APPROVED BY (INCIDENT COMMANDER)

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Activity 6.2 (cont'd)

ICS Form 203, Organization Assignment List

ORGANIZATION ASSIGNMENT LIST		1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
POSITION	NAME	4. OPERATIONAL PERIOD (DATE/TIME)		
5. INCIDENT COMMANDER AND STAFF				
INCIDENT COMMANDER		9. OPERATIONS SECTION		
DEPUTY		CHIEF		
SAFETY OFFICER		DEPUTY		
PUBLIC INFORMATION OFFICER		a. BRANCH I — DIVISION/GROUPS		
LIAISON OFFICER		BRANCH DIRECTOR		
6. AGENCY REPRESENTATIVES		DEPUTY		
AGENCY	NAME	DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		b. BRANCH II — DIVISION/GROUPS		
		BRANCH DIRECTOR		
7. PLANNING SECTION		DEPUTY		
CHIEF		DIVISION/GROUP		
DEPUTY		DIVISION/GROUP		
RESOURCES UNIT		DIVISION/GROUP		
SITUATION UNIT		DIVISION/GROUP		
DOCUMENTATION UNIT		DIVISION/GROUP		
DEMOBILIZATION UNIT		c. BRANCH III — DIVISION/GROUPS		
TECHNICAL SPECIALISTS		BRANCH DIRECTOR		
		DEPUTY		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
		DIVISION/GROUP		
8. LOGISTICS SECTION		DIVISION/GROUP		
CHIEF		d. AIR OPERATIONS BRANCH		
DEPUTY		AIR OPERATIONS BR. DIR.		
a. SUPPORT BRANCH		AIR TACTICAL GROUP SUP.		
DIRECTOR		AIR SUPPORT GROUP SUP.		
SUPPLY UNIT		HELICOPTER COORDINATOR		
FACILITIES UNIT		AIR TANKER/FIXED-WING CRD.		
GROUND SUPPORT UNIT		10. FINANCE/ADMINISTRATION SECTION		
b. SERVICE BRANCH		CHIEF		
DIRECTOR		DEPUTY		
		TIME UNIT		
COMMUNICATIONS UNIT		PROCUREMENT UNIT		
MEDICAL UNIT		COMPENSATION/CLAIMS UNIT		
FOOD UNIT		COST UNIT		
203 ICS 1-82	11. PREPARED BY (RESOURCES UNIT)			

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Activity 6.2 (cont'd)

ICS Form 206, Medical Plan

MEDICAL PLAN	1. INCIDENT NAME	2. DATE PREPARED	1. TIME PREPARED	1. OPERATIONAL PERIOD

5. INCIDENT MEDICAL AID STATIONS

MEDICAL AID STATIONS	LOCATION	PARAMEDICS	
		YES	NO

6. TRANSPORTATION

A. AMBULANCE SERVICES

NAME	ADDRESS	PHONE	PARAMEDICS	
			YES	NO

B. INCIDENT AMBULANCES

NAME	LOCATION	PARAMEDICS	
		YES	NO

7. HOSPITALS

NAME	ADDRESS	TRAVEL TIME		PHONE	HELIPAD		BURN CENTER	
		AIR	GRND		YES	NO	YES	NO

8. MEDICAL EMERGENCY PROCEDURES

202 **ICS** 3-80	9. PREPARED BY (MEDICAL UNIT LEADER)	10. REVIEWED BY (SAFETY OFFICER)

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Activity 6.2 (cont'd)

ICS Form 208HM, Site Safety and Control Plan

SITE SAFETY AND CONTROL PLAN ICS 208 HM	1. Incident Name:	2. Date Prepared:	3. Operational Period Time

Section I. Site Information

4. Incident Location:

Section II. Organization

5. Incident Commander:	6. HM Group Supervisor:	7. Tech, Specialist — HM Reference:
8. Safety Officer:	9. Entry Leader:	10. Site Access Control Leader:
11. Asst. Safety Officer — HM:	12. Decontamination Leader:	13. Safe Refuge Area Mgr.
14. Environmental Health:	15.	16.

17. Entry Team: (Buddy System) Name:	PPE Level	18. Decontamination Element: Name:	PPE Level
Entry 1		Decon 1	
Entry 2		Decon 2	
Entry 3		Decon 3	
Entry 4		Decon 4	

Section III. Hazard/Risk Analysis

19. Material:	Container type	Qty.	Phys. State	pH	IDLH	F.P.	I.T.	V.P.	V.D.	S.G.	LEL	UEL

Comment:

Section IV. Hazard Monitoring

20. LEL Instrument(s):	21. O_2 Instrument(s):
22. Toxicity/PPM Instrument(s):	23. Radiological Instrument(s):

Comment:

Section V. Decontamination Procedures

24. Standard Decontamination Procedures:	YES:	NO:

Comment:

Section VI. Site Communications

25. Command Frequency:	26. Tactical Frequency:	27. Entry Frequency:

Section VII. Medical Assistance

28. Medical Monitoring:	YES:	NO:	29. Medical Treatment and Transport In-Place:	YES:	NO:

Comment:

ICS 208 HM **Page 1** **3/98**

Section VIII. Site Map

30. Site Map:



Weather ☐ Command Post ☐ Zones ☐ Assembly Areas ☐ Escape Routes ☐ Other ☐

Section IX. Entry Objectives

31. Entry Objectives:

Section X. SOPs and Safe Work Practices

32. Modifications to Documented SOPs or Work Practices:	YES:	NO:

Comment:

Section XI. Emergency Procedures

33. Emergency Procedures:

Section XII. Safety Briefing

34. Asst. Safety Officer — HM Signature:	Safety Briefing Completed (Time):
35. HM Group Supervisor Signature:	36. Incident Commander Signature:

Activity 6.2 (cont'd)

Supplemental Information

Atchison, Topeka, & Santa Fe Railroad Co.

CONDUCTORS WHEEL REPORT

SAFETY MESSAGE FOR THE DAY: DON'T GAMBLE WITH SAFETY. WATCH OUT FOR POOR FOOTING. THIS COULD BE YOUR UNLUCKY DAY!

TRAIN ID -01CBM 08/18/93

CONDUCTOR'S NAME: R.D. HARDRIVER
DUTY STATION: YOUR CITY, USA
CALLED: 2400 08/18/93

**********	HAZARDOUS	TANK CAR	**********
001 TTX 15287	PUC	-GATX 10874	
002 TTX 15287	PUC	-GATX 22149	
**********	HAZARDOUS	TANK CAR	**********

XXXXXXXXXXXXXXXXXXXXX

001	TTX 15287	PUC	-GATX 10874	X	DANGEROUS	X
002	TTX 15287	PUC	-GATX 22149	X	DANGEROUS	X

TO/CONSIGNEE:	FROM/SHIPPER:
EDDY'S BAG AND MOP COMPANY	LIQUID CARBONIC, CORP
1495 FLOWER ST.	5700 S. ALAMEDA ST
CENTER CITY	LOS ANGELES, CA

STCC CODE -4906610 ID NUMBER UN 1040
PROPER SHIPPING NAME -ETHYLENE OXIDE (RQ 10 LBS)
PLACARD REQUIRED -POISON GAS — FLAMMABLE GAS
PLACARD ENDORSEMENT -POISON

Ethylene oxide is a clear, colorless, volatile liquid with an ethereal odor. It is used to make other chemicals, as a fumigant and industrial sterilant. It has a flash point of less than 0 F and is flammable over a wide vapor-air concentration range. The material has to be diluted on the order of 24 to 1 with water before the liquid loses its flammability. If contaminated, it may polymerize violently with evolution of heat and rupture of its container. The vapors may burn inside a container. The vapors are irritating to the eyes, skin and respiratory system. Prolonged contact with the skin may result in delayed burns. It is lighter than water and soluble in water. The vapors are heavier than air.

Severe explosion hazard when exposed to heat or flame. Irritating vapors are generated when heated. Vapor is heavier than air and may travel considerable distance to a source of ignition and flash-back. Vapor forms explosive mixtures with air over a wide range. Liquid cannot be detonated, but the vapor may be readily initiated into explosive decomposition.

Avoid metal fittings containing copper, silver, mercury or magnesium; ammonia, oxidizing agents; acids, organic bases; amines; certain salts; alcohols; mercaptans, ferric chloride; magnesium perchlorate; m-nitroaniline; trimethylamine, potassium, tin chlorides; alkanethiols; bromoethane; aluminum chloride; aluminum oxide; iron chlorides; and iron oxides. Avoid air, heat, acids and bases, and metal or metal chloride catalysts. Hazardous polymerization may occur. Avoid acids; covalent halides, such as chlorides of aluminum, iron (III) and tin (IV); basic materials like alkali hydrides, ammonia, amines and potassium; catalytically active solids, such as aluminum or iron oxides or rust, chlorides of boron, aluminum, tin and iron; some carbonates; and metals, such as copper and copper alloys.

It can cause death. Lowest inhalation concentration causing toxic effects is 12,500 parts per million (ppm)/10 seconds. It is a strong skin irritant. Neurological disorders and even death have been reported.

Move container from fire area if you can do so without risk. Stay away from ends of tanks. Fight fire from maximum distance. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire. Isolate for 1 mile in all directions if tank car or truck is involved in fire. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. Wear positive-pressure self-contained breathing apparatus (PP-SCBA) and full protective clothing. Evacuate area endangered by gas.

Extinguish with alcohol foam, carbon dioxide, dry chemical or water spray, fog, or foam. Let burn unless leak can be stopped immediately.

Keep sparks, flames and other sources of ignition away. Keep material out of water sources and sewers. Build dikes to contain flow as necessary. Attempt to stop leak if you can do so without undue personnel hazard. Use water spray to disperse vapors and dilute standing pools of liquid.

Warning: Ethylene oxide is corrosive to moist tissues. Caution is advised. Emergency personnel should wear protective clothing appropriate to the type and degree of contamination. Air-purifying or supplied-air respiratory equipment should also be worn, as necessary. Rescue vehicles should carry supplies, such as plastic sheeting and disposable plastic bags, to assist in preventing spread of contamination.

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Activity 6.2 (cont'd)

Orange County Fire Authority, Hazardous Materials Inventory Statement

ORANGE COUNTY FIRE AUTHORITY Inspection #

Hazardous Materials Inventory Reporting Form – Business Owner/Operator Identification Page

(1) CALENDAR YEAR-BEGINNING	(2) ENDING	(3) PAGE 1 OF 6
(4) BUSINESS NAME Dean's Chemicals and Paint Works	(5) BUSINESS PHONE (714) 378-1830	
(6) SITE ADDRESS 1475 Flower St.		
(7) CITY Santa Ana	(8) STATE CA	(9) ZIP 92267
(10) DUN & BRADSTREET	(11) SIC CODE (4 digit #) 2851, Paints and products	
(12) OPERATOR NAME Dean F. Hughes	(13) OPERATOR PHONE (714) 378-1830	

OWNER INFORMATION

(14) OWNER NAME Dean F. Hughes	(15) OWNER PHONE (714) 378-1830	
(16) OWNER STREET ADDRESS 1475 Flower St.		
(17) CITY Santa Ana	(18) STATE CA	(19) ZIP 92267

ENVIRONMENTAL CONTACT

(20) CONTACT NAME Alex W. Sanchex	(21) PHONE (714) 378-1830 ex. 10	
(22) MAILING STREET ADDRESS 1475 Flower St.		
(23) CITY Santa Ana	(24) STATE CA	(25) ZIP 92267

EMERGENCY CONTACTS

PRIMARY	SECONDARY
(26) NAME Alex W. Sanchez	(31) NAME Roy F. Ball
(27) TITLE Shift Supervisor	(32) TITLE Assistant Manager
(28) BUSINESS PHONE (714) 37801830 ex. 10	(33) BUSINESS PHONE (714) 378-1830 ex. 20
(29) 24-HOUR PHONE (714) 544-6745	(34) 24-HOUR PHONE (714) 223-9632
(30) PAGER Same as 24 hr. phone	(35) PAGER Same as 24 hr phone

EXTREMELY HAZARDOUS SUBSTANCE (EHS)

(36) ON-SITE EHS ☒ YES ☐ NO If yes, and above Threshold Planning Quantities, attach a sheet of paper with a general description of the process and principal equipment. (Refer to Attachment C)

(37) ADDITIONAL LOCALLY COLLECTED INFORMATION

(a) Please describe the main operation of your business. Manufacture of paints, dyes, stains and finishes.

(b) Do you have a license to purchase commercial grade pesticides? If yes, give number No

(c) EPA ID #: _____

Cetification: I certify under penalty of law that I have personally examined and am familiar with the information submitted in this inventory and believe the information is true, accurate, and complete.

(38) Print Name of Document Preparer Dean F. Hughes	
(39) Signature of Owner/Operator	(40) Date

Date of Print 5/97 Page 55 Part I

ORANGE COUNTY FIRE AUTHORITY

Hazardous Materials Inventory Statement

- Please type or print legibly in black ink.
- If additional copies are necessary, this form may be reproduced.
- For line-by-line instructions, refer to the green colored pages of the disclosure packet.
- For assistance, contact the Disclosure Office at (714) 744-0463.

(1) ADD ☐ DELETE ☐ REVISE ☐

(2) PAGE 3 OF (3) 6

(4) BUSINESS NAME: Dean's Chemicals and Paint Works

(5) CHEMICAL LOCATION: 1475 Flower St.

(6) MAP #: 1 of 1

(7) GRID #:

(8) CHEMICAL NAME: 2, 4, Toluene Di-Isocyanate

(9) COMMON NAME: Toluene Di-Isocyanate, TDI

(10) CAS #: 584849

(11) TRADE SECRET ☐ Y ☒ N

(12) EHS/Regulated Substance ☒ Y ☐ N
If EHS box is "Y" all amounts must also be in pounds

(13) FIRE CODE HAZARD CLASSES: 10, Highly Toxic

(14) TYPE: PURE ☒ MIXTURE ☐ WASTE ☐

(17) PHYSICAL STATE: SOLID ☐ LIQUID ☒ GAS ☐

(15) RADIOACTIVE ☐ Y ☒ N

(16) CURIES:

(18) FEDERAL HAZARD CATEGORIES: FIRE ☐ REACTIVE ☐ PRESSURE RELEASE ☐ ACUTE HEALTH ☐ CHRONIC HEALTH ☐

(19) STATE WASTE CODE: U223

(22) UNITS: ☒ GAL ☐ CU FT ☐ LBS ☐ TONS

(23) MAX DAILY AMT: 45,000

(20) DAYS ON SITE: 365

(24) AVG DAILY AMT: 25,000

(21) LARGEST CONTAINER: 15,000

If an Extremely Hazardous Substance/Regulated Substance, amounts must also be in pounds

(25) ANNUAL WASTE AMT: 50,000

(26) STORAGE CONTAINER

A. ABOVEGROUND TANK	B. UNDERGROUND TANK	C. PRESSURIZED TANK	D. MAGAZINE	E. DRUM	F. PLASTIC CONTAINER
G. METAL CONTAINER	H. VAT	I. IN MACHINERY	J. ON TRUCK	K. BAG	L. BOX
M. CYLINDER	N. GLASS CONTAINER	O. VARIOUS	P. RAIL CAR	Q. SILO	R. TANK INSIDE BUILDING
S. CARBOY	T. TOTE BIN	U. TANK WAGON	V. OTHER _____		

(27) STORAGE PRESSURE: 1. AMBIENT (normal) ☒ 2. ABOVE AMBIENT (pressure) ☐ 3. BELOW AMBIENT (vacuum) ☐

(28) STORAGE TEMPERATURE: 4. AMBIENT (normal) ☒ 5. ABOVE AMBIENT (heated) ☐ 6. BELOW AMBIENT ☐ 7. CRYOGENIC ☐

(29) WT %	(30) HAZARDOUS COMPONENTS	(31) EHS	(32) CAS #
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	

(33) ADDITIONAL LOCALLY COLLECTED INFORMATION

(a) IS THIS MATERIAL OR ANY OF ITS COMPONENTS A CARCINOGEN? ☒ Y ☐ N (Refer to Attachment B)
(b) IS THIS MATERIAL PREPACKAGED FOR RETAIL SALE? ☐ Y ☒ N
(c) IS THIS MATERIAL A COMMERCIAL GRADE PESTICIDE? ☐ Y ☒ N

(d) IF THIS MATERIAL IS RADIOACTIVE, WHAT TYPE OF EMITTER IS IT? ALPHA ☐ BETA ☐ GAMMA ☐

(e) HOW IS THE MATERIAL DISPOSED OF? (Refer to Table #2, page 19 of the green pages) 27, Haz Waste Landfill

(f) IS A WASTE PRODUCED OR LEFT OVER AFTER PROCESSING? ☒ Y ☐ N

(g) HOW IS THE MATERIAL USED/WHAT IS THE MATERIAL USED FOR? Used as a component of paint and dye.

FOR OFFICE USE ONLY	☐ UNDER	CARC	EXP	☐ 1
	☐ COMB	RAD	HTX	☐ 2
	☐ EXEMPT	CGP	RS	☐ 3

Date of Print 5/97 Page 56 Part II

ORANGE COUNTY FIRE AUTHORITY

Hazardous Materials Inventory Statement

- Please type or print legibly in black ink.
- If additional copies are necessary, this form may be reproduced.
- For line-by-line instructions, refer to the green colored pages of the disclosure packet.
- For assistance, contact the Disclosure Office at (714) 744-0463.

(1) ADD ☐ DELETE ☐ REVISE ☐

(2) PAGE 5 OF (3) 6

(4) BUSINESS NAME: Dean's Chemicals and Paint Works

(5) CHEMICAL LOCATION: 1475 Flower St.

(6) MAP #: 1 of 1

(7) GRID #:

(8) CHEMICAL NAME: Patassium Cyanide, spent

(9) COMMON NAME: Waste Potassium Cyanide

(10) CAS #:

(11) TRADE SECRET ☐ Y ☒ N

(12) EHS/Regulated Substance ☒ Y ☐ N
If EHS box is "Y" all amounts must also be in pounds

(13) FIRE CODE HAZARD CLASSES: 25, Toxic mat.

(14) TYPE: PURE ☐ MIXTURE ☐ WASTE ☒

(17) PHYSICAL STATE: SOLID ☐ LIQUID ☒ GAS ☐

(15) RADIOACTIVE ☐ Y ☒ N

(16) CURIES:

(18) FEDERAL HAZARD CATEGORIES: FIRE ☐ REACTIVE ☐ PRESSURE RELEASE ☐ ACUTE HEALTH ☒ CHRONIC HEALTH ☐

(19) STATE WASTE CODE: 134

(20) DAYS ON SITE: 365

(21) LARGEST CONTAINER: 200 gal.

(22) UNITS: ☒ GAL ☐ CU FT ☐ LBS ☐ TONS

If an Extremely Hazardous Substance/Regulated Substance, amounts must also be in pounds

(23) MAX DAILY AMT: 200 gal.

(24) AVG DAILY AMT: 75 gal.

(25) ANNUAL WASTE AMT: 2000 gal.

(26) STORAGE CONTAINER

A. ABOVEGROUND TANK	B. UNDERGROUND TANK	C. PRESSURIZED TANK	D. MAGAZINE	E. DRUM	F. PLASTIC CONTAINER
G. METAL CONTAINER	H. VAT	I. IN MACHINERY	J. ON TRUCK	K. BAG	L. BOX
M. CYLINDER	N. GLASS CONTAINER	O. VARIOUS	P. RAIL CAR	Q. SILO	R. TANK INSIDE BUILDING
S. CARBOY	T. TOTE BIN	U. TANK WAGON	V. OTHER _____		

(27) STORAGE PRESSURE: 1. AMBIENT (normal) ☒ 2. ABOVE AMBIENT (pressure) ☐ 3. BELOW AMBIENT (vacuum) ☐

(28) STORAGE TEMPERATURE: 4. AMBIENT (normal) ☒ 5. ABOVE AMBIENT (heated) ☐ 6. BELOW AMBIENT ☐ 7. CRYOGENIC ☐

(29) WT %	(30) HAZARDOUS COMPONENTS	(31) EHS	(32) CAS #
90	Patassium Cyanide	☒ Y ☐ N	15-150-8
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	

(33) ADDITIONAL LOCALLY COLLECTED INFORMATION

(a) IS THIS MATERIAL OR ANY OF ITS COMPONENTS A CARCINOGEN? ☐ Y ☒ N (Refer to Attachment B)
(b) IS THIS MATERIAL PREPACKAGED FOR RETAIL SALE? ☐ Y ☒ N
(c) IS THIS MATERIAL A COMMERCIAL GRADE PESTICIDE? ☐ Y ☒ N

(d) IF THIS MATERIAL IS RADIOACTIVE, WHAT TYPE OF EMITTER IS IT? ALPHA ☐ BETA ☐ GAMMA ☐

(e) HOW IS THE MATERIAL DISPOSED OF? (Refer to Table #2, page 19 of the green pages) 27, Landfill, Class 1

(f) IS A WASTE PRODUCED OR LEFT OVER AFTER PROCESSING? ☐ Y ☒ N

(g) HOW IS THE MATERIAL USED/WHAT IS THE MATERIAL USED FOR? Raw material used in wood treatment.

FOR OFFICE USE ONLY:	☐ UNDER	CARC	EXP	☐ 1
	☐ COMB	RAD	HTX	☐ 2
	☐ EXEMPT	CGP	RS	☐ 3

Date of Print 5/97 Page 56a Part II

HAZARDOUS MATERIALS DISCLOSURE

Chemical Inventory and Business Emergency Plan

Inspection # [ ]

PART III — Business Emergency Plan (BEP)

Please read instructions (on green page 18) prior to completing this Business Emergency Plan.

This form shall be typed or printed legibly in black ink.

Keep a copy for your records and return the completed original forms, with Parts I and II, to:

Orange County Fire Authority
Hazardous Materials Disclosure Office (HMDO)
P.O. Box 86
Orange, CA 92856-0086

Mark the correct box:

- [X] This is the first time I have filed a BEP.
- [ ] A BEP is required to be reviewed every two years. I am submitting my BEP to meet this requirement.
- [ ] There have been changes in my business operation and/or personnel and I am submitting a new BEP with the corrected information.

Business Name: Dean's Chemicals and Paint Works		
Address: 1475 Flower Steet		
Business Owner: Dean F. Hughes		
I certify under penalty of law that I have personally examined and am familiar with the information submitted and believe the submitted information is true, accurate, and complete.		
Print name of Owner/Operator	Signature	Date
Dean F. Hughes		12/30/97
Business Plan Prepared By	Signature	Date
Dean F. Hughes		12/30/97

OFFICIAL USE ONLY: Insp. #		Issued	Reviewed By
Received	Correction Required		

HAZARDOUS MATERIALS DISCLOSURE

Chemical Inventory and Business Emergency Plan

1. Your business is required by State Law to provide immediate notification of any release or threatened release of a hazardous material to 1) local fire emergency response personnel, 2) the Office of Emergency Services (OES), and 3) this Administering Agency. If you have a release or threatened release of hazardous materials, immediately call:

Fire/Paramedics/Police/Sheriff
Phone: 911

Individual responsible for Calling 911:
Roy F. Ball

After the local emergency response personnel are notified, you shall then notify the Administering Agency (HMDO) and the Office of Emergency Services (24 hours/day):

State Office of Emergency Services: (800) 852-7550 or (916) 262-1621

AND:
Local Administering Agency: (714) 744-6699

Individual responsible for calling this Administering Agency and the State OES:
Roy F. Ball

2. List the local emergency medical facility that will be used by your business in the event of an accident or injury caused by a release or threatened release of hazardous materials.

Hospital/Clinic			
Santa Ana Community Hospital			
Address	**City**	**Zip Code**	**Phone Number**
120 Paine St.	Santa Ana,	CA 92267	(714) 334 - 6777

3. **Does your business have a private on-site emergency response team?** ☐ Yes ☒ No

If yes, describe what policies and procedures your business will follow to notify your on-site emergency response team in the event of a release or threatened release of hazardous materials. (Attach additional pages if necessary.)

State law requires your business to complete all sections of the Emergency Response Procedure listed below. "N/A" is not acceptable.

4. Briefly describe your business's standard operating procedures in the event of a release or threatened release of hazardous materials:

a. **Prevention** (prevent the hazard) — Describe the kinds of hazards associated with the materials present at your facility. What actions will your business take to **prevent** these hazards from occurring? Issues for discussion may include safety, storage, and containment procedures.

We have pure TDI at loading rack, solutions of potassium Cyanide, and mixtures of these chemicals throughout the facility. A spill will be handled the shift supervisor and the employees will evacutate from the facility. Excess flow preventors will be activated in the event of a leak.

HAZARDOUS MATERIALS DISCLOSURE

Chemical Inventory and Business Emergency Plan

b. **Mitigation** (reduce the hazard) — Describe what is done to **lessen** the harm or the damage to person(s), property or the environment, and prevent what has occurred from getting worse or spreading. What is your immediate response to a spill, fire, explosion, or airborne release at your business?

Spill carts are available throughout the ficility. In the event of a spill all personnel will evacuate from the area.

c. **Abatement** (remove the hazard) — Describe what you would do to **stop** and **remove** the hazard. How do you handle the complete process of stopping a release, cleaning up, and disposing of released materials at your facility? What aspects of the response are beyond your ability, and need to be handled by others?

Spill Response Specialist Inc. will be called immediatly. A 3 hour response time is guaranteed.

d. Describe how you will immediately notify and evacuate your facility. What communications or alarms are used? How will you operate these during power failure? Also specify emergency exits, alternatives, and staging areas.

A public address system is the primary means of motifying plant personnel of an evacuation. Horns are located in the unloading dock area to notify dock personnel of an evacuation.

e. Your business is required by State Law to keep a copy of this Business Plan, including the chemical inventory and Site Map (Part II of the packet). Describe where copies will be located at your business. Where will other copies be maintained?

The Business Plan, site map and chemical inventory is kept in the office filing cabinet under Hazardous Materials.

Activity 6.2 (cont'd)

Material Safety Data Sheets

Printed: 01/05/1998 11:57:09

MATERIAL SAFETY DATA SHEET

Identity (As used on label and list)	Note: Blank fields are not permitted
TOLUENE DIISOCYANATE	

Section I

Manufacturer's Name	Emergency Phone #
NOT LISTED	
Address	Information Phone #
City, State, Zip Code	Date Prepared 1/98

Section II - Hazardous Ingredients

Ingredient	Percent	CAS Number
2,4-DIISOCYANATO-1-METHYLBENZE	80.00	584-84-9
Common Names and Synonyms: TOLUENE 2,6 DIISOCYANATE		
PEL: NOT EST	TLV: NOT EST	
Other Limits Recommended: NONE LISTED		
Ingredient	Percent	CAS Number
2,6-DIISOCYANATO-1-METHYLBENZE	20.00	91-08-7
Common Names and Synonyms: TOLUENE 2, 6 DIISOCYANATE		
PEL: NOT EST	TLV: NOT EST	
Other Limits Recommended: NONE LISTED		

Data Sheet For: TOLUENE DIISOCYANATE Page 2
Manufactured By: NOT LISTED
Report Printed: 01/05/1998 11:57:09

Section III - Physical/Chemical Characteristics

Boiling Point: 485 F 251C	Specific Gravity: 1.22
Vapor Pressure: <1	Melting Point: NOT LISTED
Vapor Density: 6.0	Evaporation Rate: LOW

SOLUBILITY IN WATER
LOW (REACTS)

APPEARANCE AND ODOR
WINTER WHITE TO PALE YELLOW LIQUID WITH SHARP PUNGENT ODOR.

Section IV - Fire And Explosion Hazard Data

Flash Point: | Limits: Lel: 0.9 | Uel: 9.5

EXTINGUISHING MEDIA
CO2 FOAM, DRY CHEMICAL & H20 FOG

SPECIAL FIREFIGHTING PROCEDURES
WEAR CHEMICAL PROTECTIVE SUIT WITH SELF CONTAINED BREATHING APPARATUS

UNUSUAL FIRE AND EXPLOSION HAZARDS
IISOCYANATE WILL BURN IF SUFFICIENTLY HEATED & WILL GENERATE TOXIC FUMES

Section V - Reactivity Data

STABILITY: Stable

CONDITIONS TO AVOID
AVOID HEAT MOISTURE CONTAINER CAN DEVELOP PRESSURE BUILDUP AND EXPLODE

INCOMPATABILITY (MATERIALS TO AVOID)
WATER, OXIDIXING AGENTS, ACTIVE HYDROGEN COMPOUNDS

Section V continued on next page

Data Sheet For: TOLUENE DIISOCYANATE
Manufactured By: NOT LISTED
Report Printed: 01/05/1998 11:57:09

Section V - Reactivity Data (continued)

HAZARDOUS DECOMPOSITION PRODUCTS
CO, CO2 N2 TOXIC NITROGEN COMPOUNDS

HAZARDOUS POLYMERIZATION: May Occur

CONDITIONS TO AVOID
CAUSTIC SODA TERTIARYAMINES RESULTS IN UNCONTROLLED POLYMER

Section VI - Health Hazard Data

CARCINOGENICITY	NTP?	IARC?	OSHA REGULATED
NO	NO	NO	NO

Effects and Hazards of Overexposure (Acute and Chronic)

EFFECTS AND HAZARDS OF EYE CONTACT
IRRITATION, BURNING

EFFECTS AND HAZARDS OF SKIN CONTACT
RED, SWELLING, BLISTERING, SENSITIVITY

EFFECTS AND HAZARDS OF INHALATION (BREATHING)
SEVERE IRRITATION, ASTHMA LIKE CONDITIONS

EFFECTS AND HAZARDS OF INGESTION (SWALLOWING)
CORROSIVE, IRRITANT

Emergency And First Aid Procedures

TREATMENT FOR EYE CONTACT
IMMEDIATELY FLUSH WITH PLENTY OF WATER.

TREATMENT FOR SKIN CONTACT
WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES.

TREATMENT FOR INHALATION (BREATHING)
REMOVE TO FRESH AIR. IF NOT BREATHING GIVE CPR.IF BREATHING DIFFICULT GIVE OXYGEN.

TREATMENT FOR INGESTION (SWALLOWING)
DO NOT INDUCE VOMITING. NOTHING BY MOUTH IF UNCONSCIOUS.

(Continued on next page)

Section VI continued on next page

Data Sheet For: TOLUENE DIISOCYANATE Page 4
Manufactured By: NOT LISTED
Report Printed: 01/05/1998 11:57:09

Section VI - Health Hazard Data (continued)

TREATMENT FOR INGESTION (SWALLOWING)(Cont.)
GET MEDICAL ATTENTION

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
WEAR SCBA FULL PROTECTIVE CLOTHING, RUBBER BOOTS AND GLOVES
SMALL SPILL: NEUTRALIZE. COLLECT IN OPEN TOP CONTAINER ADD ADDITIONAL NEUTRALIZER SOLUTION REMOVE TO SAFE LOCATION COVER LOOSELY AND ALLOW TO STAND 48 HOURS.
LARGE SPILL: EVACUATE PEOPLE DIKE SPILL. REDUCE FUMES WITH WATER FOG VACUUM SPILL.

WASTE DISPOSAL METHOD
DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. DO NOT WASH DOWN DRAINS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
STORE IN COOL, DRY WELL VENT AREA, AWAY FROM OXIDIZER AGENTS AND FIRE HAZARDS. KEEP TIGHTLY SEALED. DO NOT RESEAL CONTAINERS IF CONTAMINATION IS SUSPECTED.

OTHER PRECAUTIONS
AVOID EYE SKIN CONTACT. DO NOT BREATH VAPORS REMOVE CONTAMINATED CLOTHING IMMEDIATELY. DO NOT USE UNTIL LAUNDERED. TDI HAS POOR WARNING PROPERTIES SINCE ODOR AT WHICH TDI CAN BE SMELLED IS SUBSTANT. ABOVE THE TLV MAX.

Section VIII - Control Measures

RESPIRATORY PROTECTION
NIOSH/MSHA APPROVED SCBA.

Ventilation

LOCAL EXHAUST VENTILATION
VENT TO MAINTAIN <TLV

Section VIII continued on next page

Data Sheet For: TOLUENE DIISOCYANATE Page 5
Manufactured By: NOT LISTED
Report Printed: 01/05/1998 11:57:09

Section VIII - Control Measures (continued)

SPECIAL VENTILATION
NONE LISTED

MECHANICAL (GENERAL) VENTILATION
PROVIDE MECHANICAL

OTHER VENTILATION
PROVIDE GENERAL/LOCAL EXHAUST

PROTECTIVE GLOVES
RUBBER

EYE PROTECTION
CHEM SPLASH GOGGLES

OTHER PROTECTIVE EQUIPMENT
RUBBER APRON AND BOOTS. FULL PROTECTIVE CLOTHING SAFETY SHOWERS, EYEWASH STATION

WORK AND HYGIENIC PRACTICES
SAFETY SHOWERS, EYEWASH STATION

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Printed: 12/09/1997 08:46:01

MATERIAL SAFETY DATA SHEET

Identity (As used on label and list)	Note: Blank fields are not permitted
POTASSIUM CYANIDE	

Section I

Manufacturer's Name	Emergency Phone #
NOT AVAILABLE	
Address	Information Phone #
City, State, Zip Code	Date Prepared 1/87

Section II - Hazardous Ingredients

Ingredient	Percent	CAS Number
POTASSIUM CYANIDE	100.00	151-50-8

Common Names and Synonyms

PEL: NOT LISTED	TLV: NOT LISTED

Other Limits Recommended: NOT LISTED

Section III - Physical/Chemical Characteristics

Boiling Point: N/A	Specific Gravity: 1.52
Vapor Pressure: NEGLIGIBLE	Melting Point: 634.5C
Vapor Density: NOT VOLATILE	Evaporation Rate: NOT APPLICBL

SOLUBILITY IN WATER
41.7% at 25c (77F)

Section III continued on next page

Data Sheet For: POTASSIUM CYANIDE
Manufactured By: NOT AVAILABLE
Report Printed: 12/09/1997 08:46:01

Section III - Physical/Chemical Characteristics (continued)

APPEARANCE AND ODOR
GRANULAR OR BRIQUETTES

Section IV - Fire And Explosion Hazard Data

Flash Point: WONT BURN | Limits: Lel: N/A | Uel: N/A

EXTINGUISHING MEDIA
WATER ON FIRES NEAR POTASSIUM CYANIDE. DO NOT USE CARBON DIOXIDE (CO2) WHICH REACTS WITH POTASSIUM CYANIDE TO PRODUCE HYDROGEN CYANIDE IF MOISTURE IS PRESENT.

SPECIAL FIREFIGHTING PROCEDURES
POTASSIUM CYANIDE DISSOLVES READILY IN WATER, THEREFORE CYANIDE SOLUTION RUNOFF MAY OCCUR IF CONTAINERS ARE OPENED. RUNOFF SHOULD BE CONTAINED TO AVOID ENVIRONMENTAL OR SAFETY PROBLEMS. CONTAINED CYANIDE SOLUTION CAN BE DETOXIFIED WITH HYPOCHLORITE.

UNUSUAL FIRE AND EXPLOSION HAZARDS
NONE LISTED

Section V - Reactivity Data

STABILITY: Stable

CONDITIONS TO AVOID
NONE LISTED

INCOMPATABILITY (MATERIALS TO AVOID)
LARGE AMOUNTS OF HIGHLY TOXIC, FLAMMABLE HYDROGEN CYANIDE (HCN) GAS WILL BE EVOLVED FROM CONTACT WITH ACIDS. REACTS VIOLENTLY WITH STRONG OXIDIZING AGENTS. WATER OR WEAK ALKALINE SOLUTION CAN PRODUCE DANGEROUS AMOUNTS OF HCN IN CONFINED AREAS.

HAZARDOUS DECOMPOSITION PRODUCTS
NONE LISTED

HAZARDOUS POLYMERIZATION: Will Not Occur

Section V continued on next page

Data Sheet For: POTASSIUM CYANIDE Page 3
Manufactured By: NOT AVAILABLE
Report Printed: 12/09/1997 08:46:01

Section V - Reactivity Data (continued)

CONDITIONS TO AVOID
NONE LISTED

Section VI - Health Hazard Data

CARCINOGENICITY	NTP?	IARC?	OSHA REGULATED
NO	NO	NO	NO

Effects and Hazards of Overexposure (Acute and Chronic)

EFFECTS AND HAZARDS OF EYE CONTACT
PRINCIPAL HEALTH HAZARDS (INCLUDING SIGNIFICANT ROUTES, EFFECTS, SYMPTOMS OF OVER-EXPOSURE, AND MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE.)

CAUSES EYE BURNS AND MAY IRRITATR SKIN.
IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER REMOVE CONTAMINATED CLOTHING AND KEEP VICTIM QUIET AND WARM. CALL A PHYSICIAN.

EFFECTS AND HAZARDS OF SKIN CONTACT
MAY BE FATAL IF INHALED, SWALLOWED OR ABSORBED THROUGH SKIN. CONTACT WITH ACIDS OR WEAK ALKALIS LIBERATES POISONOUS GAS. WASH SKIN TO REMOVE THE CYANIDE WHILE REMOVING ALL CONTAMINATED CLOTHING, INCLUDING SHOES. DO NOT DELAY. SKIN ABSORPTION CAN OCCUR FROM CYANIDE DUST, SOLUTION, OR HCH VAPOR. ABSORPTION IS SLOWER THAN INHALATION.

HUMAN HEALTH EFFECTS OF OVEREXPOSURE MAY INITIALLY INCLUDE: SKIN IRRITATION WITH DISCOMFORT OR RASH, EYE IRRITATION OR BURNS WITH DISCOMFORT, TEARING, OR BLURRING OF VISION, AND POSSIBLE PERMANENT EYE DAMAGE; AND NONSPECIFIC DISCOMFORT SUCH AS NAUSEA, HEADACHE, DIZZINESS,VOMITING, AND WEAKNESS. HIGHER EXPOSURES MAY LEAD TO THESE EFFECTS: RAPID RESPIRATIO LOWERED BLOOD PRESSURE; UNCONSCIOUSNESS; CONVULSION, AND FATALITY. EVIDENCE SUGGESTS THAT SIGNIFICANT SKIN PERMEATION CAN OCCUR. INDIVIDUALS WITH PREEXISTING DISEASES OF THE CENTRAL NERVOUS SYSTEM MAY HAVE INCREASED SUSCEPTIBILTY TO THE TOXICITY OF EXCESSIVE EXPOSURES.

EFFECTS AND HAZARDS OF INHALATION (BREATHING)
DO NOT BREATHE DUST, MIST, OR HCN GAS. DO NOT GET IN EYES.
(Continued on next page)

Section VI continued on next page

Data Sheet For: POTASSIUM CYANIDE Page 4
Manufactured By: NOT AVAILABLE
Report Printed: 12/09/1997 08:46:01

Section VI - Health Hazard Data (continued)

EFFECTS AND HAZARDS OF INHALATION (BREATHING)(Cont.)
AVOID CONTACT WITH SKIN AND CLOTHING. DO NOT CARRY FOODSTUFF BEVERAGES, OR TOBACCO WHERE CONTAMINATING WITH CYANIDE IS POSSIBLE. WASH THOROUGHLY AFTER HANDLING. WASH CONTAMINATED CLOTHING BEFORE REUSE.

EFFECTS AND HAZARDS OF INGESTION (SWALLOWING)
NONE LISTED

Emergency And First Aid Procedures

TREATMENT FOR EYE CONTACT
FIRST AID AND MEDICAL TREATMENT:
ACTIONS TO BE TAKEN IN CASE OF CYANIDE EXPOSURE SHOULD BE PLANNED AND PRACTICED BEFORE BEGINNING WORK WITH CYANIDE. IN MOST CASES, CYANIDE POISONING CAUSES A DECEPTIVELY HEALTHY PINK TO RED SKIN COLOR, HOWEVER, IF A PHYSICAL INJURY OR LACK OF OXYGEN IS INVOLVED, THE SKIN COLOR MAY BE BLUISH. TREATMENT FOR CYANIDE POISING CAN BE PROVIDED IN TWO WAYS: FIRST AID AND MEDICAL TREATMENT. BOTH REQUIRE IMMEDIATE ACTION TO PREVENT FURTHER HARM OR DEATH. FIRST AIR USING AMYL NITRATE AND OXYGEN IS GENERALLY GIVEN BY A LAYMAN BEFORE MEDICAL HELP ARRIVES. MEDICAL TREATMENT INVOLVES INTRAVENOUS INJECTIONS AND MUST BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL. EVEN IF A DOCTOR OR NURSE IS PRESENT THE NEED FOR FAST TREATMENT DICTATES USING FIRST AID TREATMENT WITH AMYL NITRITE AND OXYGEN WHILE MEDICAL TREATMENT MATERIALS FOR INTRAVENOUS INJECTION ARE BEING PREPARED. EXPERIENCE SHOWS THAT FIRST AID GIVEN PROMPTLY IS USUALLY THE ONLY TREATMENT NEEDED.

TREATMENT FOR SKIN CONTACT
(CONT.)
MEDICAL TREATMENT IS GIVEN IF THE VICTIM DOES NOT RESPOND TO FIRST AID. IT PROVIDES A LARGER QUANTITY OF ANIDOTE INCLUDIN SOLDIUM THIOSULFATE TO CHEMICALLY DESTROY CYANIDE IN THE BODY. HOWEVER, EVEN UNDER OPTIMUM CONDITIONS, AMYL NITRITE CAN BE ADMINISTERED FASTER AND SHOULD BE USED EVEN IF MEDICAL TREATMENT FOLLOWS. DO NOT OVERREACT. FAST TREATMENT IS NEEDED, BUT A CONSCIOUS PERSON USUALLY DOES NOT NEED TREATMENT BEYOND OXYGEN. AMYL NITRITE AND MEDICAL TREATMENT KITS FOR CYANIDE POISONING ARE AVAILABLE WITH DOCTORS PRESCRIPTOIN FROM PHARMACIES.

TREATMENT FOR INHALATION (BREATHING)
(Continued on next page)

Section VI continued on next page

Data Sheet For: POTASSIUM CYANIDE Page 5
Manufactured By: NOT AVAILABLE
Report Printed: 12/09/1997 08:46:01

Section VI - Health Hazard Data (continued)

TREATMENT FOR INHALATION (BREATHING)(Cont.)
CARRY THE VICTIUM TO FRESH AIR. LAY VICTIM DOWN. ADMINISTER AMYL NITRITE ANTIDOTE AND OXYGEN. CHECK FOR AND REMOVE CONTAMINATED CLOTHING. KEEP PATIENT QUIET AND WARM. CALL A PHYSICIAN.

TREATMENT FOR INGESTION (SWALLOWING)
CONSCIOUS: IMMEDIATELY GIVE PATIENT ONE PINE OF 1% SODIUM THIOSULFATE SOLUTION OR PLAIN WATER BY MOUTH AND INDUCE VOMITING WITH FINGER IN THROAT. REPEAT UNTIL VOMIT IS CLEAR NEVER GIVE ANYTHING BY OUTH TO AN UNCONCIOUS PERSON. CALL A PHYSICIAN.
UNCONSCIOUS: FOLLOW FIRST AID PROCEDURE AS DISCUSSED EARLIER CALL A PHYSICIAN. IF THE VICTIM REVIES THEN PROCEED WITH ABOVE PROCEDURE.

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
SWEEP UP AND SHOVEL INTO A COVERED CONTAINER OR PLASTIC BAG PENDING TRANSFER TO SECURE THE SPILL. COVER AND KEEP SPILLAGE DRY. FLUSH SPILL AREA WITH A DILUTE SOLUTION OF SODIUM OR CALCIUM HYPOCHLORITE. COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS ON REPORTING RELEASES.

WASTE DISPOSAL METHOD
COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS. DO NOT FLUSH CYANIDE INTO SEWERS WHICH MAY CONTAIN AN ACID. DETOXIFY WITH SODIUM HYPOCHLORITE, OR HYDROGEN PEROXIDE, FLUSH TO WASTE WATER TREATMENT SYSTEM. OR CALL A LISCENSED DISPOSAL CONTRACTOR.

SHIPPING INFORMATION:
DOT(172.101) PROPER SHIPPING NAME- POTASSSIUM CYANIDE,SOLID
HAZARD CLASS: POISON B
UN# 1680
DOT LABEL(S): POISON
DOT PLACARD(TT/TC): POISON
DOT/IMO(172.102) PROPER SHIPPING NAME- POTASSIUM CYANIDE
HAZARD CLASS: POISON B, 6.1
UN# 1680

Section VII continued on next page

Data Sheet For: POTASSIUM CYANIDE Page 6
Manufactured By: NOT AVAILABLE
Report Printed: 12/09/1997 08:46:01

Section VII - Precautions for Safe Handling and Use (continued)

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

STORE IN PROPERLY LABELED CONTAINERS IN DRY, VENTILATED, SECURED AREAS. KEEP CONTAINERS CLOSED AND CONTENTS DRY. DO NOT STORE WITH ACIDS OR ACID SALTS, CONTAINERS WITH WATER OR WEAK ALKALIS, OR OXIDIZING AGENTS. DO NOT HANDLE OR STORE FOOD, BEVERAGES OR TOBACCO IN CYANIDE AREAS. DO NOT STORE NEAR COMBUSTIBLES OR FLAMMABLES BECAUSE OF CYANIDE SOLUTION RUNOFF FROM WATER USED FOR FIRE FIGHTING.

OTHER PRECAUTIONS

NONE LISTED

Section VIII - Control Measures

RESPIRATORY PROTECTION

HAVE AVAILABLE AND USE AS A APPROPRIATE: FACE SHIELDS, RUBBER SUITS, APRONS AND BOOTS, DISPOSABLE TOXIC DUST AND MIST RESPIRATORS,SELF CONTAINED BREATHING AIR SUPPLY (IN CASE OF EMERGENCY) HCN DETECTOR; FIRST AID AND MEDICAL TREATMENT SUPPLIES INCLUDING OXYGEN RESUSICTATORS.

Ventilation

LOCAL EXHAUST VENTILATION

GOOD VENTILATION SHOULD BE PROVIDED TO KEEP DUST, MIST AND HCN GAS BELOW EXPOSURE LIMITS

SPECIAL VENTILATION

NONE LISTED

MECHANICAL (GENERAL) VENTILATION

NONE LISTED

OTHER VENTILATION

NONE LISTED

PROTECTIVE GLOVES

RECOMMENDED MINIMUM PROTECTION: CHEMICAL SPLASH GOGGLES AND RUBBER GLOVES OR NEOPRENE.

Section VIII continued on next page

Data Sheet For: POTASSIUM CYANIDE
Manufactured By: NOT AVAILABLE
Report Printed: 12/09/1997 08:46:01

Section VIII - Control Measures (continued)

EYE PROTECTION
SPLASH GOGGLES

OTHER PROTECTIVE EQUIPMENT
NONE LISTED

WORK AND HYGIENIC PRACTICES
NONE LISTED

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Activity 6.2 (cont'd)

Orange County Fire Authority, Hazardous Materials Inventory Statement

ORANGE COUNTY FIRE AUTHORITY Inspection #

Hazardous Materials Inventory Reporting Form – Business Owner/Operator Identification Page

(1) CALENDAR YEAR-BEGINNING 11/01/97	(2) ENDING 10/31/98	(3) PAGE 1 OF 6
(4) BUSINESS NAME Eddy's Bag and Mop Manufacturing	(5) BUSINESS PHONE (714) 889-1340	
(6) SITE ADDRESS 1495 Flower Street		
(7) CITY Santa Ana	(8) STATE CA	(9) ZIP 92267
(10) DUN & BRADSTREET 321789B	(11) SIC CODE (4 digit #) 2211 Broad-woven, cotton	
(12) OPERATOR NAME Edward "Eddy" N. Wallace	(13) OPERATOR PHONE (714) 889-1340 ex. 22	

OWNER INFORMATION

(14) OWNER NAME Edward N. Wallace	(15) OWNER PHONE (714) 889-1340 ex. 22	
(16) OWNER STREET ADDRESS 1495 Flower St.		
(17) CITY Santa Ana	(18) STATE CA	(19) ZIP 92267

ENVIRONMENTAL CONTACT

(20) CONTACT NAME George W. Isaacs	(21) PHONE (714) 330-8796	
(22) MAILING STREET ADDRESS P.O. Box 665		
(23) CITY Santa Ana	(24) STATE CA	(25) ZIP 92267

EMERGENCY CONTACTS

PRIMARY	SECONDARY
(26) NAME George W. Isaacs	(31) NAME Henry O. Urick
(27) TITLE Shift Supervisor	(32) TITLE Plant Manager
(28) BUSINESS PHONE (714) 330-8796 ex. 12	(33) BUSINESS PHONE (714) 330-8796 ex. 11
(29) 24-HOUR PHONE (760) 922-7654	(34) 24-HOUR PHONE (510) 665-8875
(30) PAGER ** Same as 24 hr. phone #	(35) PAGER ** Same as 24 hr phone #

EXTREMELY HAZARDOUS SUBSTANCE (EHS)

(36) ON-SITE EHS ☒ YES ☐ NO If yes, and above Threshold Planning Quantities, attach a sheet of paper with a general description of the process and principal equipment. (Refer to Attachment C)

(37) ADDITIONAL LOCALLY COLLECTED INFORMATION

(a) Please describe the main operation of your business. We process raw cotton into twine and mops. We also treat and process recycled paper and manufacture paper bags.

(b) Do you have a license to purchase commercial grade pesticides? If yes, give number No, no pests or vermin on site.

(c) EPA ID #: _____

Cetification: I certify under penalty of law that I have personally examined and am familiar with the information submitted in this inventory and believe the information is true, accurate, and complete.

(38) Print Name of Document Preparer Lea F. Ledbedder	
(39) Signature of Owner/Operator	(40) Date

Date of Print 5/97 Page 55 Part I

ORANGE COUNTY FIRE AUTHORITY

Hazardous Materials Inventory Statement

- Please type or print legibly in black ink.
- If additional copies are necessary, this form may be reproduced.
- For line-by-line instructions, refer to the green colored pages of the disclosure packet.
- For assistance, contact the Disclosure Office at (714) 744-0463.

(1) ADD ☐ DELETE ☐ REVISE ☐

(2) PAGE 2 OF (3) 6

(4) BUSINESS NAME: Eddy's Bag and Mop Manufacturing

(5) CHEMICAL LOCATION: 1495 Flower St.

(6) MAP #: 1 of 1

(7) GRID #: B 3

(8) CHEMICAL NAME: Acetone

(9) COMMON NAME: Acetone

(10) CAS #: 67641

(11) TRADE SECRET ☐ Y ☒ N

(12) EHS/Regulated Substance ☐ Y ☒ N
If EHS box is "Y" all amounts must also be in pounds

(13) FIRE CODE HAZARD CLASSES: 4C Flam. Lq.

(14) TYPE: PURE ☒ MIXTURE ☐ WASTE ☐

(17) PHYSICAL STATE: SOLID ☐ LIQUID ☒ GAS ☐

(15) RADIOACTIVE ☐ Y ☒ N

(16) CURIES:

(18) FEDERAL HAZARD CATEGORIES: FIRE ☒ REACTIVE ☐ PRESSURE RELEASE ☐ ACUTE HEALTH ☐ CHRONIC HEALTH ☐

(19) STATE WASTE CODE:

(22) UNITS: ☒ GAL ☐ CU FT ☐ LBS ☐ TONS

(23) MAX DAILY AMT: 10 gal

(20) DAYS ON SITE: 365

(24) AVG DAILY AMT: 5 gal

(21) LARGEST CONTAINER: 1 gal

If an Extremely Hazardous Substance/Regulated Substance, amounts must also be in pounds

(25) ANNUAL WASTE AMT: 25 gal

(26) STORAGE CONTAINER

A. ABOVEGROUND TANK	B. UNDERGROUND TANK	C. PRESSURIZED TANK	D. MAGAZINE	E. DRUM	F. PLASTIC CONTAINER
G. METAL CONTAINER	H. VAT	I. IN MACHINERY	J. ON TRUCK	K. BAG	L. BOX
M. CYLINDER	N. GLASS CONTAINER	O. VARIOUS	P. RAIL CAR	Q. SILO	R. TANK INSIDE BUILDING
S. CARBOY	T. TOTE BIN	U. TANK WAGON	V. OTHER _____		

(27) STORAGE PRESSURE: 1. AMBIENT (normal) ☒ 2. ABOVE AMBIENT (pressure) ☐ 3. BELOW AMBIENT (vacuum) ☐

(28) STORAGE TEMPERATURE: 4. AMBIENT (normal) ☒ 5. ABOVE AMBIENT (heated) ☐ 6. BELOW AMBIENT ☐ 7. CRYOGENIC ☐

(29) WT %	(30) HAZARDOUS COMPONENTS	(31) EHS	(32) CAS #
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	

(33) ADDITIONAL LOCALLY COLLECTED INFORMATION

(a) IS THIS MATERIAL OR ANY OF ITS COMPONENTS A CARCINOGEN? ☐ Y ☒ N (Refer to Attachment B)
(b) IS THIS MATERIAL PREPACKAGED FOR RETAIL SALE? ☐ Y ☒ N
(c) IS THIS MATERIAL A COMMERCIAL GRADE PESTICIDE? ☐ Y ☒ N

(d) IF THIS MATERIAL IS RADIOACTIVE, WHAT TYPE OF EMITTER IS IT? ALPHA ☐ BETA ☐ GAMMA ☐

(e) HOW IS THE MATERIAL DISPOSED OF? (Refer to Table #2, page 19 of the green pages) 02, recycled

(f) IS A WASTE PRODUCED OR LEFT OVER AFTER PROCESSING? ☐ Y ☒ N

(g) HOW IS THE MATERIAL USED/WHAT IS THE MATERIAL USED FOR? Cleaner, Degreaser

FOR OFFICE USE ONLY				
	☐ UNDER	CARC	EXP	☐ 1
	☐ COMB	RAD	HTX	☐ 2
	☐ EXEMPT	CGP	RS	☐ 3

Date of Print 5/97 Page 56 Part II

ORANGE COUNTY FIRE AUTHORITY

Hazardous Materials Inventory Statement

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(1) ADD ☐ DELETE ☐ REVISE ☐

(2) PAGE 3 OF (3) 6

(4) BUSINESS NAME: Eddy's Bag and Mop Manufacturing

(5) CHEMICAL LOCATION: 1495 Flower St.

(6) MAP # 1 of 1

(7) GRID # L-4/5

(8) CHEMICAL NAME: Oxygen, Refrigerated Liquid

(9) COMMON NAME: Liquid Oxygen

(10) CAS #: 7782447

(11) TRADE SECRET ☐ Y ☒ N

(12) EHS/Regulated Substance ☐ Y ☒ N
If EHS box is "Y" all amounts must also be in pounds

(13) FIRE CODE HAZARD CLASSES: 3, Cryogen

(14) TYPE: PURE ☒ MIXTURE ☐ WASTE ☐

(17) PHYSICAL STATE: SOLID ☐ LIQUID ☒ GAS ☐

(15) RADIOACTIVE ☐ Y ☒ N

(16) CURIES

(18) FEDERAL HAZARD CATEGORIES: FIRE ☒ REACTIVE ☐ PRESSURE RELEASE ☐ ACUTE HEALTH ☐ CHRONIC HEALTH ☐

(19) STATE WASTE CODE

(20) DAYS ON SITE: 365

(21) LARGEST CONTAINER: 500 gal.

(22) UNITS: ☒ GAL ☐ CU FT ☐ LBS ☐ TONS

If an Extremely Hazardous Substance/Regulated Substance, amounts must also be in pounds

(23) MAX DAILY AMT: 500 gal.

(24) AVG DAILY AMT: 300 gal.

(25) ANNUAL WASTE AMT: none

(26) STORAGE CONTAINER

A. ABOVEGROUND TANK	B. UNDERGROUND TANK	(C) PRESSURIZED TANK	D. MAGAZINE	E. DRUM	F. PLASTIC CONTAINER
G. METAL CONTAINER	H. VAT	I. IN MACHINERY	J. ON TRUCK	K. BAG	L. BOX
M. CYLINDER	N. GLASS CONTAINER	O. VARIOUS	P. RAIL CAR	Q. SILO	R. TANK INSIDE BUILDING
S. CARBOY	T. TOTE BIN	U. TANK WAGON	V. OTHER _____		

(27) STORAGE PRESSURE: 1. AMBIENT (normal) ☐ 2. ABOVE AMBIENT (pressure) ☒ 3. BELOW AMBIENT (vacuum) ☐

(28) STORAGE TEMPERATURE: 4. AMBIENT (normal) ☐ 5. ABOVE AMBIENT (heated) ☐ 6. BELOW AMBIENT ☐ 7. CRYOGENIC ☒

(29) WT %	(30) HAZARDOUS COMPONENTS	(31) EHS	(32) CAS #
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	

(33) ADDITIONAL LOCALLY COLLECTED INFORMATION

(a) IS THIS MATERIAL OR ANY OF ITS COMPONENTS A CARCINOGEN? ☐ Y ☒ N (Refer to Attachment B)
(b) IS THIS MATERIAL PREPACKAGED FOR RETAIL SALE? ☐ Y ☒ N
(c) IS THIS MATERIAL A COMMERCIAL GRADE PESTICIDE? ☐ Y ☒ N

(d) IF THIS MATERIAL IS RADIOACTIVE, WHAT TYPE OF EMITTER IS IT? ALPHA ☐ BETA ☐ GAMMA ☐

(e) HOW IS THE MATERIAL DISPOSED OF? (Refer to Table #2, page 19 of the green pages) 23 Air Release

(f) IS A WASTE PRODUCED OR LEFT OVER AFTER PROCESSING? ☐ Y ☒ N

(g) HOW IS THE MATERIAL USED/WHAT IS THE MATERIAL USED FOR? Oxidation process by injection

FOR OFFICE USE ONLY	☐ UNDER	CARC	EXP	☐ 1
	☐ COMB	RAD	HTX	☐ 2
	☐ EXEMPT	CGP	RS	☐ 3

Date of Print 5/97 Page 56 Part II

ORANGE COUNTY FIRE AUTHORITY

Hazardous Materials Inventory Statement

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(1) ADD ☐ DELETE ☐ REVISE ☐

(2) PAGE 4 OF (3) 6

(4) BUSINESS NAME: Eddy's Bag and Mop Manufacturing

(5) CHEMICAL LOCATION: 1495 Flower St.

(6) MAP # 1 of 1

(7) GRID # F/G/H-6

(8) CHEMICAL NAME: Hydrogen, Refrigerated Liquid

(9) COMMON NAME: Hydrogen

(10) CAS # 133740

(11) TRADE SECRET ☐ Y XX N

(12) EHS/Regulated Substance ☐ Y ☒ N
If EHS box is "Y" all amounts must also be in pounds

(13) FIRE CODE HAZARD CLASSES: 3 Cryogen, 33 Flam. Gas

(14) TYPE: PURE ☒ MIXTURE ☐ WASTE ☐

(17) PHYSICAL STATE: SOLID ☐ LIQUID XX GAS ☐

(15) RADIOACTIVE ☐ Y ☒ N

(16) CURIES

(18) FEDERAL HAZARD CATEGORIES: FIRE ☒ REACTIVE ☐ PRESSURE RELEASE ☐ ACUTE HEALTH ☐ CHRONIC HEALTH ☐

(19) STATE WASTE CODE

(20) DAYS ON SITE: 365

(21) LARGEST CONTAINER: 50 gal

(22) UNITS: XX GAL ☐ CU FT ☐ LBS ☐ TONS

If an Extremely Hazardous Substance/Regulated Substance, amounts must also be in pounds

(23) MAX DAILY AMT: 50 gal

(24) AVG DAILY AMT: 20 gal

(25) ANNUAL WASTE AMT: none

(26) STORAGE CONTAINER

A. ABOVEGROUND TANK	B. UNDERGROUND TANK	C. PRESSURIZED TANK	D. MAGAZINE	E. DRUM	F. PLASTIC CONTAINER
G. METAL CONTAINER	H. VAT	I. IN MACHINERY	J. ON TRUCK	K. BAG	L. BOX
M. CYLINDER	N. GLASS CONTAINER	O. VARIOUS	P. RAIL CAR	Q. SILO	R. TANK INSIDE BUILDING
S. CARBOY	T. TOTE BIN	U. TANK WAGON	V. OTHER _____		

(27) STORAGE PRESSURE: 1. AMBIENT (normal) ☒ 2. ABOVE AMBIENT (pressure) ☐ 3. BELOW AMBIENT (vacuum) ☐

(28) STORAGE TEMPERATURE: 4. AMBIENT (normal) ☒ 5. ABOVE AMBIENT (heated) ☐ 6. BELOW AMBIENT ☐ 7. CRYOGENIC XX

(29) WT %	(30) HAZARDOUS COMPONENTS	(31) EHS	(32) CAS #
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	

(33) ADDITIONAL LOCALLY COLLECTED INFORMATION

(a) IS THIS MATERIAL OR ANY OF ITS COMPONENTS A CARCINOGEN? ☐ Y ☒ N (Refer to Attachment B)
(b) IS THIS MATERIAL PREPACKAGED FOR RETAIL SALE? ☐ Y ☒ N
(c) IS THIS MATERIAL A COMMERCIAL GRADE PESTICIDE? ☐ Y ☒ N

(d) IF THIS MATERIAL IS RADIOACTIVE, WHAT TYPE OF EMITTER IS IT? ALPHA ☐ BETA ☐ GAMMA ☐

(e) HOW IS THE MATERIAL DISPOSED OF? (Refer to Table #2, page 19 of the green pages) 23 air release during process

(f) IS A WASTE PRODUCED OR LEFT OVER AFTER PROCESSING? ☐ Y ☒ N

(g) HOW IS THE MATERIAL USED/WHAT IS THE MATERIAL USED FOR? During oxidation process, Chem binding

FOR OFFICE USE ONLY				
☐ UNDER	CARC	EXP	☐ 1	
☐ COMB	RAD	HTX	☐ 2	
☐ EXEMPT	CGP	RS	☐ 3	

Date of Print 5/97 Page 56 Part II

*ORANGE COUNTY FIRE AUTHORITY

Hazardous Materials Inventory Statement

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- For assistance, contact the Disclosure Office at (714) 744-0463.

(1) ADD ☐ DELETE ☐ REVISE ☐

(2) PAGE 5 OF (3) 6

(4) BUSINESS NAME: Eddy's Bag and Mop Manufacturing

(5) CHEMICAL LOCATION: 1495 Flower St.

(6) MAP # 1 of 1

(7) GRID # M/N - 8 thru 16

(8) CHEMICAL NAME: Ethylene Oxide

(9) COMMON NAME: ethylene Oxide, EO

(10) CAS # 75218

(11) TRADE SECRET ☐ Y ☒ N

(12) EHS/Regulated Substance ☒ Y ☐ N
If EHS box is "Y" all amounts must also be in pounds

(13) FIRE CODE HAZARD CLASSES: 34, Toxic Gas, 33 Flam Gas

(14) TYPE: PURE ☒ MIXTURE ☐ WASTE ☐

(17) PHYSICAL STATE: SOLID ☐ LIQUID ☒ GAS ☒

(15) RADIOACTIVE ☐ Y ☒ N

(16) CURIES

(18) FEDERAL HAZARD CATEGORIES: FIRE ☒ REACTIVE ☐ PRESSURE RELEASE ☐ ACUTE HEALTH ☒ CHRONIC HEALTH ☐

(19) STATE WASTE CODE: U115

(20) DAYS ON SITE: 365

(21) LARGEST CONTAINER: 10,000 gal, 9 mil Cu Ft

(22) UNITS: ☒ GAL ☐ CU FT ☐ LBS ☐ TONS

If an Extremely Hazardous Substance/Regulated Substance, amounts must also be in pounds

(23) MAX DAILY AMT: 30,000 gal., 27 mil Cu Ft

(24) AVG DAILY AMT: 20,000 gal., 18 mil Cu Ft

(25) ANNUAL WASTE AMT: 240,000 gal.

(26) STORAGE CONTAINER

A. ABOVEGROUND TANK	B. UNDERGROUND TANK	C. PRESSURIZED TANK	D. MAGAZINE	E. DRUM	F. PLASTIC CONTAINER
G. METAL CONTAINER	H. VAT	I. IN MACHINERY	J. ON TRUCK	K. BAG	L. BOX
M. CYLINDER	N. GLASS CONTAINER	O. VARIOUS	(P) RAIL CAR	Q. SILO	R. TANK INSIDE BUILDING
S. CARBOY	T. TOTE BIN	U. TANK WAGON	V. OTHER		

(27) STORAGE PRESSURE: 1. AMBIENT (normal) ☐ 2. ABOVE AMBIENT (pressure) XXX 3. BELOW AMBIENT (vacuum) ☐

(28) STORAGE TEMPERATURE: 4. AMBIENT (normal) ☒ 5. ABOVE AMBIENT (heated) ☐ 6. BELOW AMBIENT ☐ 7. CRYOGENIC ☐

(29) WT %	(30) HAZARDOUS COMPONENTS	(31) EHS	(32) CAS #
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	

(33) ADDITIONAL LOCALLY COLLECTED INFORMATION

(a) IS THIS MATERIAL OR ANY OF ITS COMPONENTS A CARCINOGEN? ☐ Y ☒ N (Refer to Attachment B)
(b) IS THIS MATERIAL PREPACKAGED FOR RETAIL SALE? ☐ Y ☒ N
(c) IS THIS MATERIAL A COMMERCIAL GRADE PESTICIDE? ☐ Y ☒ N

(d) IF THIS MATERIAL IS RADIOACTIVE, WHAT TYPE OF EMITTER IS IT? ALPHA ☐ BETA ☐ GAMMA ☐

(e) HOW IS THE MATERIAL DISPOSED OF? (Refer to Table #2, page 19 of the green pages) 31, Transfer Station

(f) IS A WASTE PRODUCED OR LEFT OVER AFTER PROCESSING? XX Y ☐ N

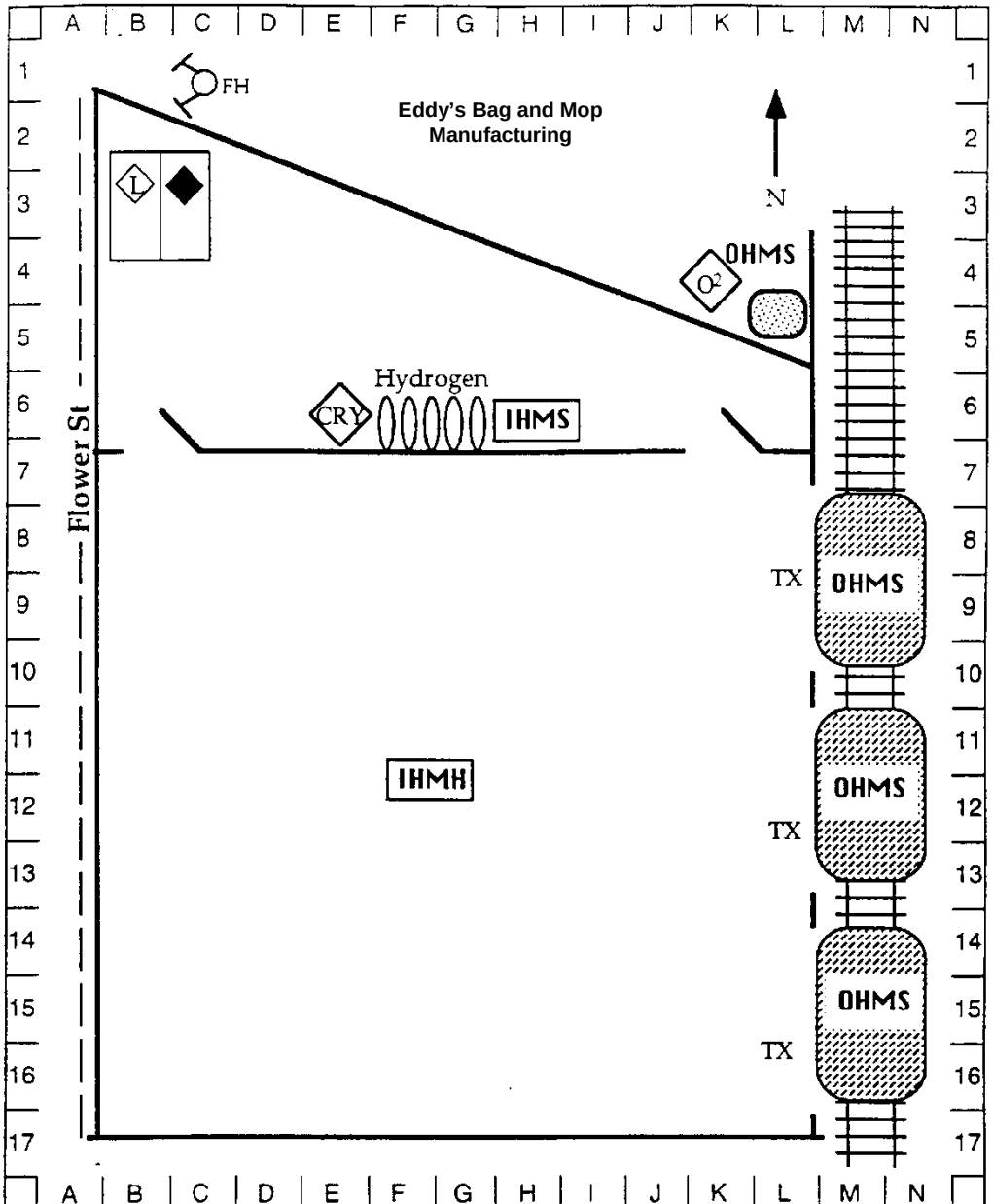
(g) HOW IS THE MATERIAL USED/WHAT IS THE MATERIAL USED FOR? During processing of paper pulp

FOR OFFICE USE ONLY: ☐ UNDER ☐ COMB ☐ EXEMPT | CARC EXP RAD HTX CGP RS | ☐ 1 ☐ 2 ☐ 3

Date of Print 5/97 Page 56 Part II

HAZARDOUS MATERIALS DISCLOSURE

Chemical Inventory and Business Emergency Plan



BUSINESS NAME	DATE
Eddy's Bag and Mop Manufacturing	11/01/97
ADDRESS	**CITY** / **ZIP**
1495 Flower St. Santa Ana, CA 92267	

Site map page 1 of 1

(page number you assign is to be entered on chemical inventory sheet)

HAZARDOUS MATERIALS DISCLOSURE

Chemical Inventory and Business Emergency Plan

Inspection # _____

PART III — Business Emergency Plan (BEP)

Please read instructions (on green page 18) prior to completing this Business Emergency Plan.

This form shall be typed or printed legibly in black ink.

Keep a copy for your records and return the completed original forms, with Parts I and II, to:

Orange County Fire Authority
Hazardous Materials Disclosure Office (HMDO)
P.O. Box 86
Orange, CA 92856-0086

Mark the correct box:

- ☐ This is the first time I have filed a BEP.
- ☒ A BEP is required to be reviewed every two years. I am submitting my BEP to meet this requirement.
- ☐ There have been changes in my business operation and/or personnel and I am submitting a new BEP with the corrected information.

Business Name Eddy's Bag and Mop Manufacturing
Address 1495 Flower Street
Business Owner Edward N. Wallace
I certify under penalty of law that I have personally examined and am familiar with the information submitted and believe the submitted information is true, accurate, and complete.
Print name of Owner/Operator — Signature — Date
Business Plan Prepared By — Signature — Date

OFFICIAL USE ONLY: Insp. # — Issued — Reviewed By
Received — Correction Required

HAZARDOUS MATERIALS DISCLOSURE

Chemical Inventory and Business Emergency Plan

1. Your business is required by State Law to provide immediate notification of any release or threatened release of a hazardous material to 1) local fire emergency response personnel, 2) the Office of Emergency Services (OES), and 3) this Administering Agency. If you have a release or threatened release of hazardous materials, immediately call:

Fire/Paramedics/Police/Sheriff
Phone: 911

Individual responsible for Calling 911:

Henry O. Urick

After the local emergency response personnel are notified, you shall then notify the Administering Agency (HMDO) and the Office of Emergency Services (24 hours/day):

State Office of Emergency Services: (800) 852-7550 or (916) 262-1621

AND:

Local Administering Agency: (714) 744-6699

Individual responsible for calling this Administering Agency and the State OES:

Edward N. Wallace

2. List the local emergency medical facility that will be used by your business in the event of an accident or injury caused by a release or threatened release of hazardous materials.

Hospital/Clinic

Orange County Medical Center

Address	City	Zip Code	Phone Number
44 vine St.	Staunton	92334	(714) 213 - 0900

3. **Does your business have a private on-site emergency response team?** ☒ Yes ☐ No

If yes, describe what policies and procedures your business will follow to notify your on-site emergency response team in the event of a release or threatened release of hazardous materials. (Attach additional pages if necessary.)

Upon notification of spill or leak, the spill response team will staff the assigned spill response carts in their respective work sites. When the location of the spill is announced over the public address system they will respond to the site.

State law requires your business to complete all sections of the Emergency Response Procedure listed below. "N/A" is not acceptable.

4. Briefly describe your business's standard operating procedures in the event of a release or threatened release of hazardous materials:

a. **Prevention** (prevent the hazard) — Describe the kinds of hazards associated with the materials present at your facility. What actions will your business take to prevent these hazards from occurring? Issues for discussion may include safety, storage, and containment procedures.

Ethylene Oxide: Off-loading crew will shut off flow at the tank cars. Water flood system will be activated. All zones have Leak detection devices that sound an alarm.

Hydrogen: Leak detection monitors are in place at all valve locations. CO2 and Halon systems are activated automaticly.

HAZARDOUS MATERIALS DISCLOSURE

Chemical Inventory and Business Emergency Plan

b. **Mitigation** (reduce the hazard) — Describe what is done to **lessen** the harm or the damage to person(s), property, or the environment, and prevent what has occurred from getting worse or spreading. What is your immediate response to a spill, fire, explosion, or airborne release at your business?

Spill response team will assemble at their assigned posts. Off-loading supervisor will excess flow valves are activated.

In the event of a fire the fire response team will activate sprinkler system in the off loading area.

c. **Abatement** (remove the hazard) — Describe what you would do to **stop** and **remove** the hazard. How do you handle the complete process of stopping a release, cleaning up, and disposing of released materials at your facility? What aspects of the response are beyond your ability, and need to be handled by others?

All spills will be cleaned up and investigated immediatly. All large spills will be cleaned up by the clean up contractor.

d. Describe how you will immediately notify and evacuate your facility. What communications or alarms are used? How will you operate these during power failure? Also specify emergency exits, alternatives, and staging areas.

Area supervisors will be paged and informed of where the emergency is located and what they shall require of their assigned employees. A public announcement will be followed by a warning signal on the emergency alerting system.

e. Your business is required by State Law to keep a copy of this Business Plan, including the chemical inventory and Site Map (Part II of the packet). Describe where copies will be located at your business. Where will other copies be maintained?

MSDS, BUSINESS PLAN WITH SITE MAP AND CHEMICAL INVENTORY WILL BE MAINTAINED IN THE LOCK BOX AT THE NORTH WEST CORNER OF THE BUILDING.

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Activity 6.2 (cont'd)

Material Safety Data Sheets

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MATERIAL SAFETY DATA SHEET

Identity (As used on label and list)	Note: Blank fields are not permitted
ACETONE	

Section I

Manufacturer's Name	Emergency Phone # IEMTK
Address	Information Phone #
City, State, Zip Code	Date Prepared 7-25-95

Section II - Hazardous Ingredients

Ingredient	Percent	CAS Number
ACETONE	100.00	67-64-1

Common Names and Synonyms
2-PROPANONE

PEL: 750 PPM (1780 MG/M3	TLV: 750 PPM (1780 MG/M3)

Other Limits Recommended: STEL 1000 PPM (2380 MG/M3

Section III - Physical/Chemical Characteristics

Boiling Point: 133 F	Specific Gravity: 2.00
Vapor Pressure: 213 @ 77	Melting Point: -138
Vapor Density: NOT LISTED	Evaporation Rate: 11.600

SOLUBILITY IN WATER
100.00 @ 68 F

(Continued on next page)

Section III continued on next page

Data Sheet For: ACETONE Page 2
Manufactured By: [illegible]
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Section III - Physical/Chemical Characteristics (continued)

SOLUBILITY IN WATER(Cont.)

VISCOSITY OF LIQUID, CST AT DEG F: 0.4 AT 68

THIS PRODUCT IS HAZARDOUS AS DEFINED IN 29 CFR1910.1200.
OSHA HAZARD
FLAMMABLE
PEL; TLV
EYE IRRITANT

APPEARANCE AND ODOR
CLEAR COLORLESS LIQUID WITH A CHARACTERISTIC PUNGENT ODOR.

CHEMICAL NAME: 2-PROPANONE
CHEMICAL FAMILY: KETONE

Section IV - Fire And Explosion Hazard Data

Flash Point: 0 DEG F TOC | Limits: Lel: 2.6 | Uel: 13.0

EXTINGUISHING MEDIA
USE WATER SPRAY TO COOL FIRE EXPOSED SURFACES AND TO PROTECT PERSONNEL. SHUT OFF FUEL TO FIRE. IF A LEAK OR SPILL HAS NOT IGNITED, USE WATER SPRAY TO DISPERSE THE VAPORS. EITHER ALLOW FIRE TO BURN UNDER CONTROLLED CONDITIONS OR EXTINGUISH WITH ALCOHOL TYPE FOAM AND DRY CHEMICAL. TRY TO COVER LIQUID SPILLS WITH FOAM.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS:
NO UNUSUAL

SPECIAL FIREFIGHTING PROCEDURES
NONE LISTED

AUTO IGNITION TEMP.: 1000 DEG F.

UNUSUAL FIRE AND EXPLOSION HAZARDS
EXTREMELY FLAMMABLE, MATERIAL WILL READILY IGNITE AT AMBIENT TEMPERATURES. EMPTY CONTAINERS RETAIN PRODUCT RESIDUE (LIQUID AND/OR VAPOR) AND CAN BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD,BRAZE,SOLDER,DRILL,GRIND, OR EXPOSE
(Continued on next page)

Section IV continued on next page

Data Sheet For: ACETONE Page 3
Manufactured By:
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Section IV - Fire And Explosion Hazard Data (continued).

UNUSUAL FIRE AND EXPLOSION HAZARDS(Cont.)
SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. EMPTY DRUMS SHOULD BE COMPLETELY DRAINED, PROPERLY BUNGED AND PROMPTLY RETURNED TO A DRUM RECONDITIONER, OR PROPERLY DISPOSED OF.

Section V - Reactivity Data

STABILITY: Stable

CONDITIONS TO AVOID
NOT APPLICABLE

INCOMPATABILITY (MATERIALS TO AVOID)
CAUSTICS, AMINES, ALKANOLAMINES, ALDEHYDES, AMMONIA AND STRONG OXIDIZING AGENTS, AND CHLORINATED COMPOUNDS.

HAZARDOUS DECOMPOSITION PRODUCTS
NONE

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID
NOT APPLICABLE

Section VI - Health Hazard Data

CARCINOGENICITY	NTP?	IARC?	OSHA REGULATED
YES	YES	YES	YES

Effects and Hazards of Overexposure (Acute and Chronic)

EFFECTS AND HAZARDS OF EYE CONTACT
IRRITATING. WILL INJURE EYE TISSUE IF NOT REMOVED PROMPTLY

EFFECTS AND HAZARDS OF SKIN CONTACT
FREQUENT OF PROLONGED CONTACT MAY IRRITATE AND CAUSE
(Continued on next page)

Section VI continued on next page

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Manufactured By:
Report Printed: 12/08/1997 15:26:10

Section VI - Health Hazard Data (continued)

EFFECTS AND HAZARDS OF SKIN CONTACT(Cont.)
DERMATITIS. LOW ORDER OF TOXICITY.

EFFECTS AND HAZARDS OF INHALATION (BREATHING)
VAPOR CONCENTRATIONS ABOVE RECOMMENDED EXPOSURE LEVELS ARE IRRITATING TO THE EYES AND THE RESPIRATORY TRACT, MAY CAUSE HEADACHES AND DIZZINESS, ARE ANESTHETIC AND MAY HAVE OTHER CENTRAL NERVOUS SYSTEM EFFECTS.

EFFECTS AND HAZARDS OF INGESTION (SWALLOWING)
MINIMAL TOXICITY
SMALL AMOUNTS OF THE LIQUID ASPIRATED INTO THE RESPIRATORY SYSTEM DURING INGESTION, OR FROM VOMITING MAY CAUSE BRONCHOPNEUMONIA OR PULMONARY EDEMA.

Emergency And First Aid Procedures

TREATMENT FOR EYE CONTACT
IMMEDIATELY FLUSH EYES WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. GET PROMPT MEDICAL ATTENTION.

TREATMENT FOR SKIN CONTACT
IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER;USE SOAP IF AVAILABLE. REMOVE CONTAMINATED CLOTHING, INCLUDING SHOES AFTER FLUSHING HAS BEGUN.

TREATMENT FOR INHALATION (BREATHING)
USING PROPER RESPIRATORY PROTECTION, IMMEDIATELY REMOVE THE AFFECTED VICTIM FROM EXPOSURE. ADMINISTER ARTIFICIAL RESPIRATION IF BREATHING IS STOPPED. KEEP AT REST. CALL FOR PROMPT MEDICAL ATTENTION.

TREATMENT FOR INGESTION (SWALLOWING)
FIRST AID IS NORMALLY NOT REQUIRED.

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
LAND SPILL: ELIMINATE SOURCE OF IGNITION. PREVENT ADDITIONAL DISCHARGE OF MATERIAL, IF POSSIBLE TO DO SO WITHOUT HAZARD. FOR SMALL SPILLS IMPLEMENT CLEANUP PROCE-
DURES;FOR LARGE SPILLS IMPLEMENT CLEANUP PROCEDURES; AND,IF
(Continued on next page)

Section VII continued on next page

Data Sheet For: ACETONE
Manufactured By
Report Printed: 12/08/1997 15:26:10

Section VII - Precautions for Safe Handling and Use (continued)

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED(Cont.)

IN PUBLIC AREA, KEEP PUBLIC AWAY AND ADVISE AUTHORITIES. ALSO IF THIS PRODUCT IS SUBJECT TO CERCLA REPORTING (SEE SECTION 8 REGULATORY INFORMATION) NOTIFY THE NATIONAL RESPONSE CENTER. PREVENT LIQUID FROM ENTERING SEWERS, WATERCOURSES, OR LOW AREAS. CONTAIN SPILLED LIQUID WITH SAND OR EARTH. DO NOT USE COMBUSTIBLE MATERIALS SUCH AS SAWDUST. RECOVER BY PUMPING (USE AN EXPLOSION PROOF OR HAND PUMP) OR WITH A SUITABLE ABSORBENT. CONSULT AN EXPERT ON DISPOSAL OF RECOVERED MATERIAL AND ENSURE CONFORMITY TO LOCAL DISPOSAL REGULATIONS. WATER SPILL: ELIMINATE SOURCES OF IGNITION. WARN OCCUPANTS AND SHIPPING IN SURROUNDING AND DOWNWIND AREAS OF FIRE AND EXPLOSION HAZARD AND REQUEST ALL TO STAY CLEAR. CONSULT AN EXPERT ON DISPOSAL OF RECOVERED MATERIAL AND ENSURE CONFORMITY TO LOCAL DISPOSAL REGULATIONS

WASTE DISPOSAL METHOD

CONSULT AN EXPERT ON DISPOSAL OF RECOVERED MATERIAL AND ENSURE CONFORMITY TO LOCAL DISPOSAL REGULATIONS.

ECOLOGICAL INFORMATION: NO SPECIFIC ECOLOGICAL DATA ARE AVAILABLE FOR THIS PRODUCT. PLEASE REFER TO SECTION 7 FOR INFORMATION REGARDING ACCIDENTAL RELEASES AND SECTION 8 FOR REGULATORY REPORTING INFORMATION.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

KEEP CONTAINER CLOSED. HANDLE AND OPEN CONTAINERS WITH CARE STORE IN A COOL,WELL VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. DO NOT HANDLE OR STORE NEAR AN OPEN FLAME, HEAT OR OTHER SOURCES OF IGNITION. PROTECT MATERIAL FROM DIRECT SUNLIGHT. THIS MATERIAL IS NOT A STATIC ACCUMULATOR, BUT USE PROPER GROUNDING PROCEDURES. DO NOT PRESSURIZE,CUT,HEAT, OR WELD CONTAINERS. EMPTY PRODUCT CONTAINERS MAY CONTAIN PRODUCT RESIDUE. DO NOT REUSE EMPTY CONTAINERS WITHOUT COMMERCIAL CLEANING OR RECONDITIONING

ELECTROSTATIC ACCUMULATION HAZARD: NO, BUT USE PROPER GROUNDING PROCEDURE. STORAGE TEMPERATURE, DEG F: AMBIENT. LOADING/UNLOADING TEMPERATURE, DEG F: AMBIENT. STORAGE/ TRANSPORT PRESSURE, MMHG: ATMOSPHERIC. LOADING/UNLOADING VISCOSITY, CST: 0.4

OTHER PRECAUTIONS

NONE LISTED

(Continued on next page)

Section VII continued on next page

Data Sheet For: ACETONE Page 6
Manufactured By
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Section VII - Precautions for Safe Handling and Use (continued)

OTHER PRECAUTIONS(Cont.)

THIS INFORMATION MAY BE SUBJECT TO THE PROVISIONS OF THE COMMUNITY RIGHT-TO-KNOW REPORTING REQUIREMENTS(40 CFR 370) IF THRESHOLD QUANTITY CRITERIA ARE MET. THIS PRODUCT DOES NOT CONTAIN SECTION 313 REPORTABLE INGREDIENTS.
OTHER INFORMATION:
NOTES: THIS PRODUCT CONTAINS LOW LEVELS, UP TO 30PPM, OF BENZENE. BENZENE IS LISTED AS A HUMAN AND ANIMAL CARCINOGEN BY OSHA, NTP AND IARC. HAZARD RATING SYSTEMS: THIS INFO-MATION IF FOR PEOPLE TRAINED IN: NATIONAL PAINT & COATINGS ASSOCIATIONS (NPCA) HAZARDOUS MATERIALS IDENTIFICATION SYST. (HMIS) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 704) IDENTIFICATION OF THE FIRE HAZARDS OF MATERIALS

	NPCA-HMIS	NFPA 704	KEY
HEALTH	2	1	4=SEVERE
FLAMMABILITY	3	3	3=SERIOUS
REACTIVITY	0	0	2=MODERATE
			1=SLIGHT
			0=MINIMAL

Section VIII - Control Measures

RESPIRATORY PROTECTION

WHERE CONCENTRATIONS IN AIR MAY EXCEED THE LIMITS GIVEN IN THIS SECTION AND ENGINEERING, WORK PRACTICES OR OTHER MEANS OF EXPOSURE REDUCTION ARE NOT ADEQUATE, NIOSH/MSHA APPROVED RESPIRATORS MAY BE NECESSARY TO PREVENT OVEREXPOSURE BY INHALATION. REVISION SUMMARY:
SINCE MARCH 1, 1995 THIS MSDS HAS BEEN REVISED IN REGULATORY INFORMATION SECTION:
REFERENCE NUMBER: HDHA-C-001
THIS INFORMATION RELATES TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH INFORMATION IS TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE COMPILED. HOWEVER, NO REPRESENTATION WARRANTY OR GUARANTEE IS MADE AS TO ITS ACCURACY,RELIABILITY OR COMPLETENESS. IT IS THE USERS RESPONSIBLITY TO SATISFY HIMSELF AS TO THE SUITABILITY AND COMPLETENESS OF SUCH INFO-MATION FOR HIS OWN PARTICULAR USE.WE DO NOT ACCEPT LIABILITY FOR ANY LOSS OF DAMAGE THAT MAY OCCUR FROM THE USE OF THIS INFORMATION NOR DO WE OFFER WARRANTY AGAINST PATENT INFRINGEMENT.

Section VIII continued on next page

Data Sheet For: ACETONE Page 7
Manufactured By:
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Section VIII - Control Measures (continued)

Ventilation

LOCAL EXHAUST VENTILATION
USE EXPLOSION PROOF VENTILATION EQUIPMENT.

SPECIAL VENTILATION
NONE LISTED

MECHANICAL (GENERAL) VENTILATION
THE USE OF MECHANICAL DILUTION VENTILATION IS RECOMMENDED WHENEVER THIS PRODUCT IS USED IN A CONFINED SPACE, IS HEATED ABOVE AMBIENT TEMPERATURES OR IS AGITATED.

OTHER VENTILATION
NONE LISTED

PROTECTIVE GLOVES
FOR OPEN SYSTEMS WHERE CONTACT IS LIKELY, WEAR LONG SLEEVES CHEMICAL RESISTANT GLOVES, AND CHEMICAL GOGGLES.

EYE PROTECTION
WHERE CONTACT MAY OCCUR, WEAR SAFETY GLASSES WITH SIDE SHIELDS.

OTHER PROTECTIVE EQUIPMENT
NONE LISTED

WORK AND HYGIENIC PRACTICES
NONE LISTED

REGULATORY INFORMATION: TSCA:THIS PRODUCT IS LISTED ON THE TSCA INVENTORY AS CAS REGISTRY NUMBER 67-64-1. CERCLA: IF THE REPORTABLE QUANTITY OF THIS PRODUCT IS ACCIDENTALLY SPILLED, THE INCIDENT IS SUBJECT TO THE PROVISIONS OF THE COMPREHENSIVE ENVIRONMENTAL RESPONSE,COMPENSATION AND LIABILITY ACT (CERCLA) AND MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER BY CALLING 800-424-8802. THE REPORTABLE SPILL QUANTITY OF THIS PRODUCT IS 5,000 POUNDS. IT CONTAINS ACETONE. SARA TITLE III: UNDER THE PROVISIONS OF TITLE III, SECTION 311/312 OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT, THIS PRODUCT IS CLASSIFIED INTO THE FOLLOWING HAZARD CATEGORIES: IMMEDIATE HEALTH, DELAYED HEALTH, FIRE. TOXICOLOGICAL INFORMATION: PLEASE REFER TO SECTION 6 FOR AVAILABLE INFORMATION ON POTENTIAL HEALTH EFFECTS. DISPOSAL CONSIDERATIONS: PLEASE REFER TO SECTIONS 4, 7, AND

(Continued on next page)

Section VIII continued on next page

Data Sheet For: ACETONE Page 8
Manufactured By: [illegible]
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Section VIII - Control Measures (continued)
WORK AND HYGIENIC PRACTICES(Cont.)
8 FOR DISPOSAL AND REGULATORY INFORMATION.
TRANSPORT INFORMATION: DEPARTMENT OF TRANSPORTATION(DOT):
DOT SHIPPING DESCRIPTION: ACETONE, 3, UN 1090, II.

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MATERIAL SAFETY DATA SHEET

Identity (As used on label and list)	Note: Blank fields are not permitted
LIQUID OXYGEN	

Section I

Manufacturer's Name	Emergency Phone #
NOT AVAILABLE	
Address	Information Phone #
City, State, Zip Code	Date Prepared
	11/91

Section II - Hazardous Ingredients

Ingredient	Percent	CAS Number
OXYGEN	99.50	7782-44-7

Common Names and Synonyms

PEL: NONE	TLV: NONE

Other Limits Recommended: NONE

Section III - Physical/Chemical Characteristics

Boiling Point: -297 F	Specific Gravity: 1.14
Vapor Pressure: 760 MM/HG	Melting Point: NONE LISTED
Vapor Density: 1.11	Evaporation Rate: N/A

SOLUBILITY IN WATER
SLIGHTLY (VAPOR)

Section III continued on next page

Data Sheet For: LIQUID OXYGEN
Manufactured By: NOT AVAILABLE
Report Printed: 12/08/1997 15:15:55

Section III - Physical/Chemical Characteristics (continued)

APPEARANCE AND ODOR
LIQUID IS CLEAR AND LIGHT BLUE; VAPOR IS COLORLESS AND ODORLESS.

Section IV - Fire And Explosion Hazard Data

Flash Point: N/A | Limits: Lel: N/A | Uel: N/A

EXTINGUISHING MEDIA
FIRES WITH OXYGEN AS THE OXIDIZER SHOULD BE FOUGHT WITH COPIOUS QUANTITIES OF WATER.

SPECIAL FIREFIGHTING PROCEDURES
IF POSSIBLE, STOP THE SOURCE OF OXYGEN WHICH IS SUPPORTING THE FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS
VIGOUROUSLY ACCELERATES COMBUSTION. MANY COMPOUNDS WHICH ARE NOT FLAMMABLE IN AIR MAY BURN IN PURE OXYGEN. IF LIQUID CYLINDERS ARE INVOLVED IN A FIRE, SAFETY RELOCATE OR KEEP COOL WITH WATER SPRAY

Section V - Reactivity Data

STABILITY: Stable

CONDITIONS TO AVOID
N/A

INCOMPATABILITY (MATERIALS TO AVOID)
ALL FLAMMABLE MATERIAL

HAZARDOUS DECOMPOSITION PRODUCTS
NONE

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID
N/A

Data Sheet For: LIQUID OXYGEN Page 3
Manufactured By: NOT AVAILABLE
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Section VI - Health Hazard Data

CARCINOGENICITY	NTP?	IARC?	OSHA REGULATED
NO	NO	NO	NO

Effects and Hazards of Overexposure (Acute and Chronic)

EFFECTS AND HAZARDS OF EYE CONTACT
CONTACT WITH CRYOGENIC LIQUID OR COLD PIPING COULD RESULT IN CYOGENIC BURNS OR FROSTBITE.

EFFECTS AND HAZARDS OF SKIN CONTACT
ROUTES OF ENTRY: SKIN

CONTACT WITH THE CYOGENIC LIQUID OR COLD PIPING COULD RESULT IN CYOGENIC BURNS OR FROSTBITE.

FLUSH AFFECTED AREAS WITH LUKEWARE WATER. DO NOT USE HOT WATER. A PHYSICIAN SHOULD SEE THE PATIENT PROMPTLY IF THE CRYOGENIC BURN HAS RESULTED IN BLISTERING OF THE DERMAL SURFACE OR DEEP TISSUE FREEXING.

EFFECTS AND HAZARDS OF INHALATION (BREATHING)
OXYGEN IS THE VITAL ELEMENT IN THE ATMOSPHER IN WHICH WE LIVE AND BREATHE. THE ATMOSPHERE CONTAINS APPROXIMATELY 21 MOLOR % OXYGEN. BREATHING HIGHER CONCENTRATION COULD LEAD TO HYPEROXIA AND PNEUMONIA OR COULD PRESENT A RISK OF INFLAMMATION OF ORGANIC MATTER IN THE BODY.
PERSONS IN ILL HEALTH WHERE SUCH ILLNESS WOULD BE AGGRAVATED BY EXPOSURE TO HIGHER THAN NORMAL LEVELS OF OXYGEN SHOULD NOT BE ALLOWED TO WORK WITH OR HANDLE THIS PRODUCT.
CAUTION: WELDING OR BRAZING MAY PRODUCE FUMES AND GASES HAZARDOUS TO HEALTH. AVOID BREATHING THESE FUMES AND GASES. USE ADEQUATE VENTILATION. SEE ANSIZ-49.1 SAFETY IN WELDING AND CUTTING PUBLISHED BY THE AMERICAN WELDING SOCIETY AND OSHA SAFETY REGULATIONS UNDER 29 CFR 1910.252 WELDING, CUTTING AND BRAZING. ALSO SEE ACGIH TLVS 1991-1992 APPENDIX B AND SECTION B2, WELDINF FUMES ARC RAYS CAN INJURE EYES AND BURN SKIN.

EFFECTS AND HAZARDS OF INGESTION (SWALLOWING)
NOT LISTED

Emergency And First Aid Procedures

TREATMENT FOR EYE CONTACT
(Continued on next page)

Section VI continued on next page

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Manufactured By: NOT AVAILABLE
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Section VI - Health Hazard Data (continued)

TREATMENT FOR EYE CONTACT(Cont.)
NOT LISTED.

TREATMENT FOR SKIN CONTACT
NOT LISTED

TREATMENT FOR INHALATION (BREATHING)
CONSCIOUS PERSOS SHOULD BE ASSISTED TO AN UNCONTAMINATED AREA AND BREATHE FRESH AIR. THEY SHOULD BE KEPT WARM AND QUIET. THE PHYSICIAN SHOULD BE INFORMED THAT THE VICTIM IS EXPERIENCING (HAS EXPERIENCED) HYPEROXIA. UNCONSCIOUS PERSON SHOULD BE MOVED TO AN UNCONTAMINATED AREA AND GIVEN ASSISTED RESPIRATION. WHEN BREATHING HAS BEEN RESTORED, TREATMENT SHOULD BE AS ABOVE. CONTINUED TREATMENT SHOULD BE SYMPTOMATIC AND SUPPORTIVE.

TREATMENT FOR INGESTION (SWALLOWING)
NOT LISTED

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
LIQUID OXYGEN IS DELIVERED TO A CUSTOMER INTO STATIONERY VACUUM-JACKETED VESSELS AT THE CUSTOMERS LOCATION OR IN PORTABLE VACUUM JACKED LIQUID CYLINDERS. STATIONERY CUSTOMER SITE VESSELS SHOULD BE OPERATED IN ACCORDANCE WITH THE MANUFACTURERS AND YOUR SUPPLIERS INSTRUCTIONS. DO NOT ATTEMPT TO REPAIR, ADJUST, OR IN ANY OTHER WAY MODIFY THE OPERATION OF THESE VESSELS. IF THERE IS A MALFUNCTION OR OTHER TYPE OF OPERATION PROBLEM WITH THE VESSEL, CONTACT THE CLOSEST SUPPLIER LOCATION IMMEIDATELY.
LIQUID OXYGEN CYLINDERS SHOULD BE USED ONLY IN WELL VENT-ILATED AREAS AND IN ACCORDANCE WITH THE MANUFACTURERS AND YOUR SUPPLIERS INSTRUCTIONS. THESE CYLINDERS MUST ALWAYS BE KEPT IN AN UPRIGHT POSITION. SPECIALIZED HAND TRUCKS ARE NEEDED FOR THEIR MOVEMENT. A FIRST IN FIRST OUT INVENTORY SYSTEM SHOULD BE USED WITH THESE CYLINDERS.

WASTE DISPOSAL METHOD
NOT LISTED

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
(Continued on next page)

Section VII continued on next page

Data Sheet For: LIQUID OXYGEN
Manufactured By: NOT AVAILABLE
Report Printed: 12/08/1997 15:15:55

Section VII - Precautions for Safe Handling and Use (continued)

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING(Cont.)

PROTECT LIQUID CYLINDERS AGAINST PHYSICAL DAMAGE. STORE IN COOL, DRY, WELL-VENTILATED AREA AWAY FROM SOURCES OF HEAT OR DIRECT SUNLIGHT. DO NOT ALLOW AREAS WHERE LIQUID CYLINDERS ARE STORED TO EXCEED 125 F. USE A CHECK VALVE OR TRAP IN THE LIQUID CYLINDER DISCHARGE LINE TO PREVENT HAZARDOUS BACKFLOW LIQUID CYLINDERS SHOULD BE STORED UPRIGHT AND FIRMLY SECURED TO PREVENT FALLING OR BEING KNOCKED OVER. KEEP OIL, GREASE AND ALL FLAMMABLES AWAY. DO NOT STORE WITH FLAMMABLE GASES. OPEN OXYGEN VALVES SLOWLY.

OTHER PRECAUTIONS

USE ONLY DOT AND ASME CODED VESSELS. USE A PRESSURE REDUCING REGULATOR WHEN CONNECTING LIQUID CYLINDER TO LOWER PRESSURE PIPING OR SYSTEM. OXYGEN EQUIPMENT MUST BE CLEANED AND DEGREASED FOR OXYGEN SERVICE. CLOSE VALVE AFTER EACH USE AND WHEN EMPTY. LIQUID CYLINDERS MAY NOT BE REFILLED EXCEPT BY OR WITH THE CONSENT OF LIQUID CARBONIC. FOR FURTHER INFO. REFER TO CGA PAMPHLETS P1 G4.1 AND F14 WHICH HAVE TO DO WITH LIQUID CYLINDER HANDLING, OXYGEN RICH ATMOSPHERES AND CLEANING FOR OXYGEN SERVICE.

Section VIII - Control Measures

RESPIRATORY PROTECTION

N/A

Ventilation

LOCAL EXHAUST VENTILATION

N/A

SPECIAL VENTILATION

N/A

MECHANICAL (GENERAL) VENTILATION

N/A

OTHER VENTILATION

N/A

Section VIII continued on next page

Data Sheet For: LIQUID OXYGEN
Manufactured By: NOT AVAILABLE
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Section VIII - Control Measures (continued)

PROTECTIVE GLOVES
LOOSE FITTING, INSULATED

EYE PROTECTION
SAFETY GOGGLES OR GLASSES AND TRANSPARENT FULL FACE SHIELD

OTHER PROTECTIVE EQUIPMENT
SAFETY SHOES, SAFETY SHOWER. USE APPROPRIATE PROTECTIVE EQUIPMENT WHEN WELDING OR CUTTING

WORK AND HYGIENIC PRACTICES
NONE LISTED

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MATERIAL SAFETY DATA SHEET

Identity (As used on label and list)	Note: Blank fields are not permitted
LIQUID HYDROGEN	

Section I

Manufacturer's Name	Emergency Phone #
NOT AVAILABLE	
Address	Information Phone #
City, State, Zip Code	Date Prepared 9/91

Section II - Hazardous Ingredients

Ingredient	Percent	CAS Number
HYDROGEN	99.90	1333-74-0

Common Names and Synonyms

PEL: NOT LISTED	TLV: NOT LISTED

Other Limits Recommended: NOT LISTED

Section III - Physical/Chemical Characteristics

Boiling Point: -423 F	Specific Gravity: .071
Vapor Pressure: N/A	Melting Point: N/A
Vapor Density: 0.695	Evaporation Rate: N/A

SOLUBILITY IN WATER
N/A

Section III continued on next page

Data Sheet For: LIQUID HYDROGEN
Manufactured By: NOT AVAILABLE
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Section III - Physical/Chemical Characteristics (continued)

APPEARANCE AND ODOR
CLEAR, COLORLESS, ODORLESS, CRYOGENIC LIQUID.

Section IV - Fire And Explosion Hazard Data

Flash Point: N/A	Limits: Lel: 4	Uel: 74.5

EXTINGUISHING MEDIA
WATER, CARBON DIOXIDE, DRY CHEMICAL

SPECIAL FIREFIGHTING PROCEDURES
IF POSSIBLE STOP THE FLOW OF HYDROGEN. HYDROGEN BURNS WITH AN ALMOST INVISIBLE FLAME OF RELATIVELY LOW THERMAL RADIATION

UNUSUAL FIRE AND EXPLOSION HAZARDS
HYDROGEN IS VERY LIGHT AND RISES VERY RAPIDLY IN AIR. SHOULD A HYDROGEN FIRE BE EXTINGUISHED AND THE FLOW OF GAS CONTINUE, INCREASE VENTILATION TO PREVENT AN EXPLOSION HAZARD, PARTICULARY IN THE UPPER PORTIONS OF BUILDINGS OR SHEDS WHERE THE GAS NIGHT COLLECT.

Section V - Reactivity Data

STABILITY: Stable

CONDITIONS TO AVOID
N/A

INCOMPATABILITY (MATERIALS TO AVOID)
OXIDIZERS

HAZARDOUS DECOMPOSITION PRODUCTS
NONE

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID
N/A

Data Sheet For: LIQUID HYDROGEN
Manufactured By: NOT AVAILABLE
Report Printed: 12/08/1997 16:11:59

Section VI - Health Hazard Data

CARCINOGENICITY	NTP?	IARC?	OSHA REGULATED
NO	NO	NO	NO

Effects and Hazards of Overexposure (Acute and Chronic)

EFFECTS AND HAZARDS OF EYE CONTACT
CONTACT WITH THE CRYOGENIC LIQUID CAN CAUSE TISSUE FREEZING OR FROSTBITE ON DERMAL CONTACT OF IF SPLASHED IN EYES. PERSONS IN ILL HEALTH WHERE SUCH ILLNESS WOULD BE AGGRAVATED BY EXPOSURE TO LIQUID HYDROGEN SHOULD NOT BE ALLOWED TO WORK WITH OR HANDLE THIS PRODUCT

EFFECTS AND HAZARDS OF SKIN CONTACT
SEE EFFECTS ON SKIN CONTACT

EFFECTS AND HAZARDS OF INHALATION (BREATHING)
HIGH CONCENTRATIONS OF HYDROGEN SO AS TO EXCLUDE AN ADEQUATE SUPPLE OF OXYGEN TO THE LUNGS CAUSES DIZZINESS, DEEPER BREATHING DUE TO AIR HUNGER, POSSIBLE NAUSEA AND EVENTUAL UNCONSCIOUSNESS.

EFFECTS AND HAZARDS OF INGESTION (SWALLOWING)
NOT LISTED

Emergency And First Aid Procedures

TREATMENT FOR EYE CONTACT
NOT LISTED

TREATMENT FOR SKIN CONTACT
FLUSH AFFECTED AREA WITH COPIOUS QUANTITIES OF TEPID (103-115F) WATER. SEEK MEDICAL HELP FOR THERMAL INJURY.

TREATMENT FOR INHALATION (BREATHING)
REMOVE TO FRESH AIR. IF UNCONCIOUS OR BREATHING IS DIFFICULT ADMINISTER ARTIFICIAL RESPIRATION WITH SUPPLEMENTAL OXYGEN. KEEP WARM AND AT REST.CAUTION WHEN ENTERING CONTAMINATED AREA DUE TO FIRE AND EXPLOSION HAZARD. SAFELY VENTILATE AREA TO LESS THAN LEL CONCENTRATION

TREATMENT FOR INGESTION (SWALLOWING)
NOT LISTED

Data Sheet For: LIQUID HYDROGEN
Manufactured By: NOT AVAILABLE
Report Printed: 12/08/1997 16:11:59

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

EVACUATE ALL PERSONAL UPWIND AND AWAY FROM AFFECTED AREA. STOP LEAK IF POSSIBLE. PERSONNEL INVOLVED IN ATTEMPTING TO STOP LEAK SHOULD USE SELF CONTAINED BREATHING APARATUS. ELIMINATE SOURCES OF IGNITION. SUPPLY MAXIMUM VENTILATION WITH EXPLOSION PROOF EQUIPMENT.

WASTE DISPOSAL METHOD

LOCATE LEAKING CONTAINERS IN A REMOTE DOWNWIND AREA OUTSIDE AND ALLOW TO VENT TO ATMOSPHER. INCINERATE GAS BY CONTROLLED BURNING IN FLARE IF POSSIBLE. FOLLOW FEDERAL, STATE OR LOCAL REGULATION.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

STATIONERY CUSTOMER SITE VESSELS SHOULD BE OPERATED IN ACCORDANCE WITH THE MANUFACTURER AND YOUR SUPPLIERS INSTRUCTIONS. DO NOT ATTEMPT TO REPAIR, ADJUST OR IN ANY OTHER WAY MODIFY THE OPERATION OF THESE VESSELS. IF THERE IS A MALFUNCTION OR OTHER TYPER OF OPERATIONAL PROBLEM WITH THE VESSEL, CONTACT THE CLOSEST SUPPLIER LOCATION IMMEDIATELY NO SMOKING OR OPEN FLAMES SHOULD BE ALLOWED NEAR THESE VESSELS.

LIQUID HYDROGEN CYLINDERS SHOULD BE USED ONLY IN WELL-VENTILATED AREAS OF NON COMBUSTIBLE CONSTRUCTION AND IN ACCORDANCE WITH MANUFACTURERS AND YOUR SUPPLIERS INSTRUCTIONS. THESE CYLINDERS MUST ALWAYS BE KEPT IN A UPRIGHT POSITION. SPECIALIZED HAND TRUCKS ARE NEEDED FOR THEIR MOVEMENT. A FIRST IN FIRST OUT INVENTORY SYSTEM SHOULD BE USED WITH THESE CYLINDERS.

OTHER PRECAUTIONS

EARTH GROUND AND BOND ALL LINES AND EQUIPMENT ASSOCIATED WITH THE HYDROGEN SYSTEM. ELECTRICAL EQUIPMENT SHOULD BE NON SPARKING OR EXPLOSION PROOF. THESE CRYOGENIC LIQUID CYLINDERS MAY NOT BE REFILLED EXCEPT BY OR WITH THE CONSENT OF LIQUID CARBONIC.

Section VIII - Control Measures

RESPIRATORY PROTECTION

SELF-CONTAINED BREATHING APPARATUS AVAILABLE IN EVENT OF LEAK OR SPILL

Section VIII continued on next page

Data Sheet For: LIQUID HYDROGEN
Manufactured By: NOT AVAILABLE
Report Printed: 12/08/1997 16:11:59

Section VIII - Control Measures (continued)

Ventilation

LOCAL EXHAUST VENTILATION
N/A

SPECIAL VENTILATION
N/A

MECHANICAL (GENERAL) VENTILATION
N/A

OTHER VENTILATION
N/A

PROTECTIVE GLOVES
LOOSE FITTING, INSULATED

EYE PROTECTION
SAFETY GOGGLES OR GLASSES

OTHER PROTECTIVE EQUIPMENT
SAFETY SHOES, SAFETY SHOWER

WORK AND HYGIENIC PRACTICES
NOT LISTED

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MATERIAL SAFETY DATA SHEET

Identity (As used on label and list)	Note: Blank fields are not permitted
ETHYLENE OXIDE	

Section I

Manufacturer's Name	Emergency Phone #
NOT AVAILABLE	
Address	Information Phone #
City, State, Zip Code	Date Prepared 12/8/97

Section II - Hazardous Ingredients

Ingredient	Percent	CAS Number
ETHYLENE OXIDE	100.00	75-21-8

Common Names and Synonyms

PEL: NOT LISTED	TLV: NOT LISTED

Other Limits Recommended: NOT LISTED

Section III - Physical/Chemical Characteristics

Boiling Point: 10.4 C	Specific Gravity: 0.8711
Vapor Pressure: 1095	Melting Point: NOT LISTED
Vapor Density: 1.49	Evaporation Rate: NOT LISTED

SOLUBILITY IN WATER
COMPLETE

Section III continued on next page

Data Sheet For: ETHYLENE OXIDE Page 2
Manufactured By: NOT AVAILABLE
Report Printed: 12/08/1997 14:40:12

Section III - Physical/Chemical Characteristics (continued)

APPEARANCE AND ODOR
COLORLESS GAS, NONRESIDUAL ODOR

Section IV - Fire And Explosion Hazard Data

Flash Point: < 0 F | Limits: Lel: 3.0 | Uel: 100

EXTINGUISHING MEDIA
CARBON DIOXIDE OR DRY CHEMICAL FOR SMALL FIRES. POLYMER OR ALCOHOL FOAMS FOR LARGE FIRES.

SPECIAL FIREFIGHTING PROCEDURES
DURING LARGE RELEASES OF ETHYLENE OXIDE, SHUT OFF SUPPLY OF FUEL. IT MAY BE BEST TO ALLOW FUEL TO BURN OUT AND PROTECT ADJACENT SURFACES WITH APPLICATION OF WATER. DILUTION OF ETO WITH 23 VOLUMES OF WATER RENDER IT NONFLAMMABLE

UNUSUAL FIRE AND EXPLOSION HAZARDS
THE VAPORS OF ETHYLENE OXIDE WILL BURN WITHOUT PRESENCE OF AIR OR OTHER OXIDIZERS.

Section V - Reactivity Data

STABILITY: Stable

CONDITIONS TO AVOID
TEMPERATURES ABOVE 800 F

INCOMPATABILITY (MATERIALS TO AVOID)
ALKALIES AND ACIDS

HAZARDOUS DECOMPOSITION PRODUCTS
THERMAL DECOMPOSITION MAY PRODUCE CARBON MONOXIDE AND/OR CARBON DIOXIDE.

HAZARDOUS POLYMERIZATION: May Occur

CONDITIONS TO AVOID
CONTAMINATION WITH AQUEOUS ALKALIES, AMINES MINERAL ACIDS,
(Continued on next page)

Section V continued on next page

Data Sheet For: ETHYLENE OXIDE Page 3
Manufactured By: NOT AVAILABLE
Report Printed: 12/08/1997 14:40:12

Section V - Reactivity Data (continued)

CONDITIONS TO AVOID(Cont.)
METAL CHLORIDES OR METAL OXIDES.

Section VI - Health Hazard Data

CARCINOGENICITY	NTP?	IARC?	OSHA REGULATED
NOT LISTED	NOT LISTED	NOT LISTED	NOT LISTED

Effects and Hazards of Overexposure (Acute and Chronic)

EFFECTS AND HAZARDS OF EYE CONTACT
EYES SEVERELY IRRITATED

EFFECTS AND HAZARDS OF SKIN CONTACT
CONTACT WITH SKIN CAUSES BLISTERING AND BURNS

EFFECTS AND HAZARDS OF INHALATION (BREATHING)
SEVERAL NAUSEA WITH VOMITING, NARCOSIS, LUNG IRRITATION

EFFECTS AND HAZARDS OF INGESTION (SWALLOWING)
NOT LISTED

Emergency And First Aid Procedures

TREATMENT FOR EYE CONTACT
IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES

TREATMENT FOR SKIN CONTACT
IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES

TREATMENT FOR INHALATION (BREATHING)
LEAVE AREA OF VAPORS. IF NAUSEA AND VOMITING START CALL A PHYSICIAN. INJECTIONS OF COMPAZINE OR OF SODIUM LUMINAL MAY SUPPRESS VOMITING.

TREATMENT FOR INGESTION (SWALLOWING)
NOT LISTED

Data Sheet For: ETHYLENE OXIDE Page 4
Manufactured By: NOT AVAILABLE
Report Printed: 12/08/1997 14:40:12

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
FLUSH SPILLED MATERIAL WITH LARGE VOLUMES OF WATER

WASTE DISPOSAL METHOD
INCINERATE IN A FURNACE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
NOT LISTED

OTHER PRECAUTIONS
NOT LISTED

Section VIII - Control Measures

RESPIRATORY PROTECTION
AIR SUPPLIED MASK

Ventilation

LOCAL EXHAUST VENTILATION
PREFERABLE

SPECIAL VENTILATION
NOT LISTED

MECHANICAL (GENERAL) VENTILATION
ACCEPTABLE

OTHER VENTILATION
NOT LISTED

PROTECTIVE GLOVES
RUBBER OR PLASTIC

EYE PROTECTION
GOGGLES

OTHER PROTECTIVE EQUIPMENT
FACE SHIELD, SAFETY SHOWER AND EYE BATH

Section VIII continued on next page

Data Sheet For: ETHYLENE OXIDE
Manufactured By: NOT AVAILABLE
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Section VIII - Control Measures (continued)

WORK AND HYGIENIC PRACTICES

NOT LISTED

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Activity 6.3

Dean's Chemicals and Paint Works Incident, Part 2

Purpose

To develop an IAP for a new operational period for an incident that has been ongoing for several hours.

Directions

1. Review the materials used in John's Bavarian Dairy Incident and Dean's Chemicals and Paint Works Incident, as well as nearby exposures.

2. Review the incident objectives that had been implemented during the current operational period, and review changes to conditions that may have occurred. Complete the Size-Up Information Worksheet.

3. Complete the following assignments:

    a. Conduct a tactics meeting, and determine what strategic goals/incident objectives you want to employ during the next operational period. Complete the Strategic Goals/Incident Objectives Worksheet.

    b. Determine how long the next operational period will be. Complete the Tactical Objectives Worksheet. (It will begin in 90 minutes.)

    c. Review the safety issues, and update ICS Form 208HM if needed. Complete the Decontamination and Critical Safety Factors Worksheet and Risk Management Worksheet.

    d. Update or complete new ICS Forms 202, 203, 206 and 208HM based on your new incident objectives/strategic goals.

    e. Complete ICS Forms 215, Operational Planning Worksheet and 215A, Incident Action Plan Safety Analysis for the next operational period based on the Center City resource listing.

    f. Prepare a briefing agenda, and prepare for an operational briefing at the end of the activity.

    g. Determine what positions or functions your group members will represent during the operational briefing. Complete the Operational Briefing Worksheet and Emergency Operations Center — Incident Scene Interface Worksheet.

Scenario

It is now 11 a.m., and the incident continues to escalate. You established a Unified CP located at the real estate office just south of the railroad tracks on Broadway Street. It is about 500 feet south of the derailed and leaking rail cars. In the CP is the mayor, the owner of Dean's, plant manager of Eddy's, the police chief, county medical director, county emergency management director, a railroad manager, county parks superintendent, county sheriff, county fire coordinator, and the fire chief of Center City.

Mutual aid from South Town and Ridge County are assisting at the scene, manning Center City fire stations and positioning Staging 1/2 mile to the south. All the resources listed on the resource inventory are available.

At 10:45 a.m., the Hazmat Group Supervisor reports that they entered the scene twice and determined that one ethylene oxide car is leaking, and two toluene diisocyanate (TDI) cars connected to manifolds at Dean's are also leaking. They are unable to stop the leak of the ethylene oxide as the hole is on the bottom side of the car and is not accessible. They were able to get the valve closed on one TDI car, but the second car is damaged and cannot be closed. They have evacuated the area and advised that there are no further actions they can perform to stop the leaks.

Two portable master stream devices have been placed at each end of the derailed cars but have not been activated. There is concern about further environmental damage if water is added and flows to the Wildlife Refuge downstream.

Workers have been removed from Eddy's, and no one was allowed to enter Dean's. The fairgrounds and day care center were told to shelter-in-place.

At 11:05 a.m., a large explosion occurs, and the derailment scene erupts into flames. In a matter of seconds, Eddy's is also involved in flames. Both Dean's and John's are now threatened by the fire. The two master stream devices have been charged, but the explosion has changed their direction. The water streams are of little value at this time.

Your hazmat specialist, along with the railroad manager, reaffirms that there is little that can be done to extinguish the fire at the rail cars. Letting them burn may be the only option.

There is little that can be done to stop the fire in Eddy's. Trying to protect the exposures is a topic of immediate discussion, including the expansion of the isolation zone and evacuation of nearby occupancies.

Given this situation, your Command group will need to develop an IAP for the next operational period. This incident will take several hours to allow the tank cars to burn themselves out. Hopefully, the remaining cars can be protected and the buildings exposed.

Activity 6.3 (cont'd)

Size-Up Information Worksheet

Product(s): _____

Container(s): _____

Environment: _____

Other critical factors: _____

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Activity 6.3 (cont'd)

Strategic Goals/Incident Objectives Worksheet

Below are the typical strategic goals or items that may become incident objectives. Use this page to write SMART incident objectives for each strategic goal you wish to use.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Recovery/Termination:
Other incident objectives/goals:

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Activity 6.3 (cont'd)

Tactical Objectives Worksheet

For each incident objective/strategic goal identified on the Strategic Goals/Incident Objectives Worksheet, list the tactical objective you would use to accomplish that goal. The tactical objectives assigned should be within the scope of duty for the responders who will be assigned to them and within a standard of care.

Isolation:
Notification:
Identification:
Protection:
Control — leak:
Control — spill:
Control — fire:
Termination/Recovery:

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Activity 6.3 (cont'd)

Decontamination and Critical Safety Factors Worksheet

What decontamination measures will you employ before the responders take any action where they may be exposed to the product(s), and what, if any, decontamination measures would you take following the incident?

Critical safety factors for first responders:
Critical safety factors for people within the incident Hot Zone:
Critical safety factors for the public:
Other critical factors:

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Activity 6.3 (cont'd)

Risk Management Worksheet

For each safety issue identified for the incident, as the IC, what risk management measures would you initiate or have initiated?

Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:
Safety issue: Risk management measure to be applied:

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Activity 6.3 (cont'd)

Operational Briefing Worksheet

Prepare an agenda to follow at an operational briefing that will unveil the IAP of incident objectives/strategic goals and tactical objectives for the next operational period. People from the Command and General Staff who helped develop the IAP also should help deliver the operational briefing for a given area. As an example, a Planning Section Chief (PSC) would open the meeting, the current IC would provide a brief overview of what has happened during this operational period and discuss whether the incident objectives/strategic goals had been accomplished. Other staff would provide briefing material.

Agenda item 1: _____

Who will present? _____

Agenda item 2: _____

Who will present? _____

Agenda item 3: _____

Who will present? _____

Agenda item 4: _____

Who will present? _____

Agenda item 5: _____

Who will present? _____

Agenda item 6: _____

Who will present? _____

Agenda item 7: _____

Who will present? _____

Agenda item 8: _____

Who will present? _____

Activity 6.3 (cont'd)

Emergency Operations Center — Incident Scene Interface Worksheet

The EOC can be a valuable tool for the on-scene IC at major incidents. Many of the peripheral issues being generated, such as evacuations and need for sheltering, closing of transportation routes, and need to support logistical issues, can be supported by EOC personnel. The EOC will be the meeting point for elected officials and decision-making personnel from the major agencies in the community, and it will typically be the location where information is disseminated.

As the on-scene IC for the incident, what issues or actions would you want to hand off to the EOC?

1. _____

2. _____

3. _____

4. _____

What agencies should be represented in the EOC for the incident you are managing?

1. _____

2. _____

3. _____

4. _____

How could you use the EOC to assist you in the management of your incident?

1. _____

2. _____

3. _____

4. _____

Any special requests for the EOC?

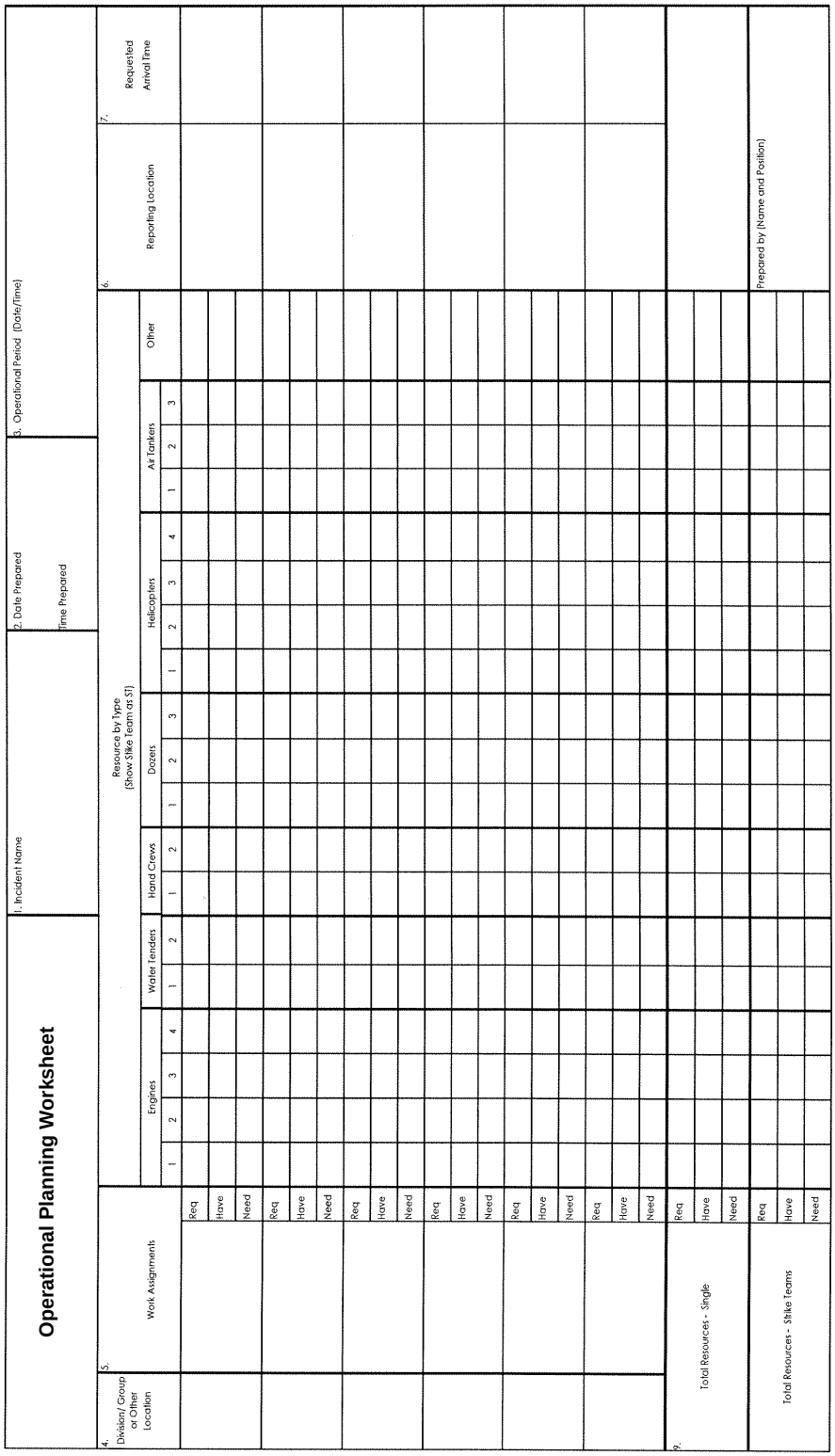
1. _____

2. _____

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Activity 6.3 (cont'd)

ICS Form 215, Operational Planning Worksheet



Operational Planning Worksheet

1. Incident Name
2. Date Prepared — Time Prepared
3. Operational Period (Date/Time)

4. Division/ Group or Other Location	5. Work Assignments		Resource by Type (Show Strike Team as ST)																						6. Reporting Location	7. Requested Arrival Time
			Engines				Water Tenders		Hand Crews		Dozers			Helicopters				Air Tankers			Other					
			1	2	3	4	1	2	1	2	1	2	3	1	2	3	4	1	2	3						
		Req																								
		Have																								
		Need																								
		Req																								
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		Req																								
		Have																								
		Need																								
9. Total Resources - Single		Req																								
		Have																								
		Need																								
Total Resources - Strike Teams		Req																							Prepared by (Name and Position)	
		Have																								
		Need																								

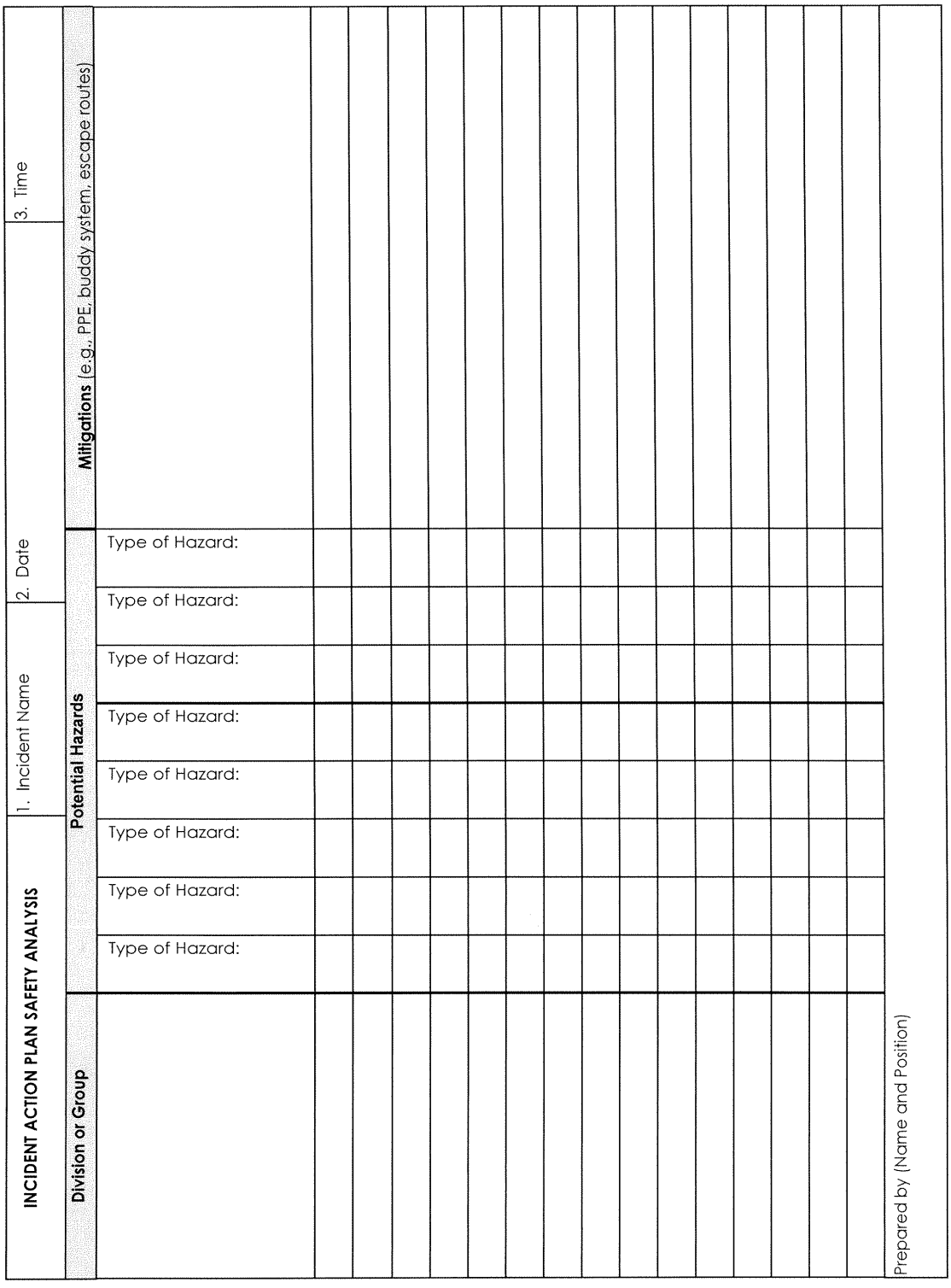
ICS 215

NFES 1338

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Activity 6.3 (cont'd)

ICS Form 215A, Incident Action Plan Safety Analysis



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Activity 6.4

Termination and Recovery

Purpose

To complete the final step of the incident response: termination and recovery. Based on your activities of the past several hours at three incidents, it is now time to consider the elements of incident termination and recovery.

Directions

1. Read the scenario.

2. Consider the elements required to terminate this incident.

3. Prepare a plan to terminate the incident, and develop considerations that may be used to complete the tasks.

4. Develop considerations that would be required for recovery from the incidents.

5. Complete the Termination Worksheet and the Recovery Issues Worksheet.

6. Select a representative to present your group's findings.

Scenario

The leaking and burning ethylene oxide car has been depleted. Eddy's was completely consumed by the fire. Because of the hazmat cars, you were unable to make a suitable suppression effort. Fortunately, Dean's received only heat damage on the wall exposed to the tank cars, and the building sustained smoke damage. John's received light smoke damage.

The contents of the two cars hooked to the manifold of TDI at Dean's have been contained within the car while the third has leaked out. One of the ethylene oxide cars was released and burned completely while the other car remains intact.

Unified Command has been terminated and returned to Single Command with the fire chief as the IC. The Command and General Staff have met with railroad officials and the state Environmental Protection Agency (EPA). The state EPA has agreed to take responsibility for Command, but needs continued support from the fire department for two days while the product is unloaded from the three rail cars (two of TDI and one of ethylene oxide) and until final environmental testing is completed. They have requested a standby engine company, a standby hazmat entry team for the safety of the workers, and a decontamination station for workers.

As part of the termination process, these three requests must be considered and decisions made on how they will be managed for three days. Additionally, one engine company will be needed at Eddy's for the next 12 hours for hot spots and flare-ups.

As this point, it is unclear if there will be any financial recovery available from the railroad or the owners of John's, Dean's or Eddy's. Both Dean's and Eddy's are in bankruptcy and are uninsured. The railroad attorneys will sue the City for not informing them that the reservoir had failed and the tracks washed out.

You have used over 200 gallons of diesel fuel; lost a generator and two light stands in the fire; lost several hundred feet of hose; broken one master stream device; and it appears that the paint on Engine 1, which was parked close to the leaking rail cars, will need to be repainted and all exterior trim replaced.

Activity 6.4 (cont'd)

Termination Worksheet

Consider the following termination issues and how you would prepare for and handle them. Additionally, list other termination issues that your group feels are appropriate.

1. Continuing scene duties: _____

   _____

   a. Eddy's fire watch: _____

      _____

   b. Engine company standby: _____

      _____

   c. Hazmat team standby: _____

      _____

   d. Decontamination station: _____

      _____

2. Exposure reports: _____

   _____

3. Debriefing: _____

   _____

4. Critique: _____

   _____

5. Decontamination of responder equipment and PPE: _____

   _____

6. Examination and evaluation of equipment for damage/contamination: _____

   _____

7. Other termination issues: _____

_____

Activity 6.4 (cont'd)

Recovery Issues Worksheet

Consider the recovery issues listed and determine what procedures you would recommend to resolve any recovery issues.

1. Operational recovery (supplies, equipment, etc.): _____

2. Financial recovery: _____

3. Other recovery issues: _____

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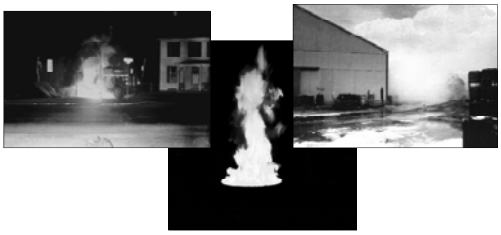
NOTE-TAKING GUIDE

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NOTE-TAKING GUIDE

Slide 6-1

HAZARDOUS MATERIALS INCIDENT MANAGEMENT



Slide 6-1

Slide 6-2

UNIT 6: MANAGING HAZARDOUS MATERIALS INCIDENTS

Slide 6-2

Slide 6-3

TERMINAL OBJECTIVES

The students will be able to:

- **Analyze information related to the incident, extrapolate the potential course and harm, and using a risk-based approach, determine objectives, strategies and tactics in order to develop a plan of action for each scenario, given several scenarios of varying complexities.**
- **Implement an effective Incident Command System (ICS) for the scenario.**
- **Manage a hazmat incident using their Incident Action Plan (IAP).**

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Slide 6-4

ENABLING OBJECTIVES

The students will:

- **Identify the presence of hazmat at a simulated incident.**
- **Select appropriate emergency response actions for first responders at the operations technician response level.**
- **Identify and develop appropriate safety measures to protect the responders, public and environment.**
- **Develop an IAP for an incident with multiple operational periods.**
- **Describe the process of termination and recovery for a simulated incident.**

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Slide 6-5

Activity 6.1
John's Bavarian Dairy Incident



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Slide 6-6

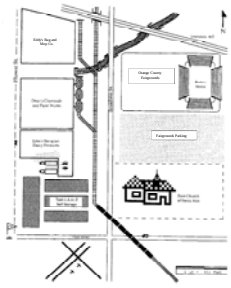
OPERATIONS LEVEL RESPONSE
JOHN'S BAVARIAN DAIRY

- **Size-Up Information Worksheet**
- **Strategic Goals/Incident Objectives Worksheet**
- **Tactical Objectives Worksheet**
- **Decontamination and Critical Safety Factors Worksheet**
- **Risk Management Worksheet**
- **ICS Form 201, Incident Briefing**
- **ICS Form 208HM, Site Safety and Control Plan**

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INCIDENT SCENE PLOT PLAN



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Slide 6-8

Activity 6.2
Dean's Chemicals and Paint Works Incident, Part 1



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Slide 6-9

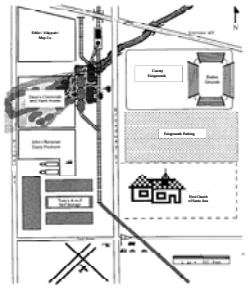
TECHNICIAN LEVEL RESPONSE — DEAN'S CHEMICALS AND PAINT WORKS INCIDENT

- **Size-Up Information Worksheet**
- **Strategic Goals/Incident Objectives Worksheet**
- **Tactical Objectives Worksheet**
- **Decontamination and Critical Safety Factors Worksheet**
- **Risk Management Worksheet**
- **ICS Form 201**
- **ICS Form 202, Incident Objectives**
- **ICS Form 203, Organization Assignment List**
- **ICS Form 206, Medical Plan**
- **ICS Form 208HM**

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INCIDENT SCENE PLOT PLAN



Slide 6-10

Slide 6-11

Activity 6.3
Dean's Chemicals and Paint Works Incident, Part 2



Slide 6-11

Slide 6-12

TECHNICIAN LEVEL RESPONSE WITH EOC ACTIVATION — DEAN'S CHEMICALS AND PAINT WORKS INCIDENT

- **Size-Up Information Worksheet**
- **Strategic Goals/Incident Objectives Worksheet**
- **Tactical Objectives Worksheet**
- **Decontamination and Critical Safety Factors Worksheet**
- **Risk Management Worksheet**
- **Operational Briefing Worksheet**
- **Emergency Operations Center — Incident Scene Interface Worksheet**
- **ICS Form 215, Operational Planning Worksheet**
- **ICS Form 215A, Incident Action Plan Safety Analysis**

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Slide 6-13

Activity 6.4
Termination and Recovery



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Slide 6-14

TERMINATION AND RECOVERY

- **Termination Worksheet**
- **Recovery Issues Worksheet**

Slide 6-14

Slide 6-15

SUMMARY

- **Most hazmat incidents will be managed and stabilized at the first responder operations level.**
- **Incidents that exceed the capabilities, training and equipment of the first responder operations level will require a technician level response.**
- **Large-scale incidents may require an Emergency Operations Center (EOC) to help manage the peripheral issues being generated by the incident.**

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APPENDIX

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INCIDENT RECOVERY FORM

INCIDENT NUMBER _____ INCIDENT DATE _____ INCIDENT TIME _____

INCIDENT SYNOPSIS

ATTACHMENTS

Incident Briefing	[ ]	Demobilization Check Out	[ ]
Medical Monitoring	[ ]	Incident Status	[ ]

DESCRIBE THE RESTORATION OF THE OPERATIONAL AREA TO THE SAFE CONDITIONS THAT EXISTED BEFORE THE INCIDENT OCCURRED.

Coordination of private, local, state, and federal agencies.

Monitoring and oversight of cleanup operations, product transfer, and the removal of the container or vehicle.

The Transfer of Command process to the responsible agency for the postemergency phase of the incident.

DESCRIBE THE RESTORATION OF RESOURCE FORCES FROM ALL AGENCIES TO A CONDITION OF READINESS.

The release of special called units and mutual-aid forces.

Resupply of materials for operating units and restocking of bulk items not ordinarily carried by responders.

Equipment and supplies used during mitigation and the procedure for applying for financial restitution.

ADDITIONAL NOTES OR COMMENTS

INCIDENT DEBRIEFING FORM

INCIDENT NUMBER _____ INCIDENT DATE _____ INCIDENT TIME _____

DEBRIEFING DATE _____ TIME _____ LOCATION _____

INCIDENT SYNOPSIS

_____

_____

_____

_____

TIME ACTIONS

1. SITUATION STATUS:
2. COMMUNICATIONS:
3. ACTIONS TAKEN:
4. BY WHOM:

TIME ACTIONS

1. SITUATION STATUS:
2. COMMUNICATIONS:
3. ACTIONS TAKEN:
4. BY WHOM:

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TIME ACTIONS

1. SITUATION STATUS:
2. COMMUNICATIONS:
3. ACTIONS TAKEN:
4. BY WHOM:

POTENTIAL EXPOSURE INFORMATION ON SUBSTANCES INVOLVED

SUBSTANCE 1

Name/Synonyms: _____

Routes of Exposure: _____

Symptoms of Exposure: _____

Actions to be Taken: _____

SUBSTANCE 2

Name/Synonyms: _____

Routes of Exposure: _____

Symptoms of Exposure: _____

Actions to be Taken: _____

SUBSTANCE 3

Name/Synonyms: _____

Routes of Exposure: _____

Symptoms of Exposure: _____

Actions to be Taken: _____

SUBSTANCE 4

Name/Synonyms: _____

Routes of Exposure: _____

Symptoms of Exposure: _____

Actions to be Taken: _____

SUBSTANCE 5

Name/Synonyms: _____

Routes of Exposure: _____

Symptoms of Exposure: _____

Actions to be Taken: _____

SUBSTANCE 6

Name/Synonyms: _____

Routes of Exposure: _____

Symptoms of Exposure: _____

Actions to be Taken: _____

SUBSTANCE 7

Name/Synonyms: _____

Routes of Exposure: _____

Symptoms of Exposure: _____

Actions to be Taken: _____

SUBSTANCE 8

Name/Synonyms: _____

Routes of Exposure: _____

Symptoms of Exposure: _____

Actions to be Taken: _____

FOR FURTHER INFORMATION OR IN THE EVENT OF SYMPTOMS, CONTACT:

NAME_____TELEPHONE NUMBER _____

Notes/Comments_____

_____

HAZARDOUS MATERIALS INCIDENT CRITIQUE

INCIDENT NUMBER _____ INCIDENT DATE _____ INCIDENT TIME _____

ADDRESS _____ TYPE ALARM _____

LOCATION DESCRIPTION (if not an address) _____

_____

PERSON SUBMITTING REPORT _____ DIVISION _____

DATE OF CRITIQUE _____ LOCATION OF CRITIQUE _____

OFFICERS AND COMPANIES IN ATTENDANCE

OFFICER'S NAME	COMPANY NUMBER

INCIDENT WEATHER CONDITIONS

CONDITIONS AT TIME OF ARRIVAL AT SCENE _____

_____

_____

_____

DID CONDITIONS CHANGE DURING THE INCIDENT? [ ] YES [ ] NO

IF A CHANGE OCCURRED, DESCRIBE IT. _____

_____

_____

WIND DIRECTION _____ WIND VELOCITY _____

INCIDENT DEVELOPMENT

DESCRIBE THE SITUATION AND THE CONDITIONS FOUND BY FIRST-ARRIVING UNITS

_____

_____

_____

_____

_____

_____

STATE THE TIME WHEN A HAZARDOUS MATERIALS RESPONSE WAS REQUESTED

_____

IDENTIFY WHO REQUESTED IT _____

EVACUATION PROCEDURES

WAS AN EVACUATION NECESSARY? [ ] YES [ ] NO

WHO GAVE THE ORDER TO EVACUATE? _____

HOW WERE EVACUATION DISTANCES DETERMINED?

BY USING THE North American Emergency Response Guidebook (NAERG)?
[ ] YES [ ] NO

DESCRIBE THE OTHER MEANS _____

_____

_____

_____

IF EVACUATION WAS NECESSARY, WHO CARRIED IT OUT? _____

EVACUATE THE EVACUATION IMPLEMENTATION_____

ACTIONS OF INITIAL RESPONSE UNITS

COMPANY	ACTION

WAS THE DEPARTMENT'S HAZARDOUS MATERIALS PROTOCAL USED?

[ ] YES [ ] NO

REMARKS

DESCRIBE AND EVALUATE HOW THE INCIDENT WAS HANDLED.

OUTSIDE AGENCIES NOTIFIED

AGENCY NOTIFIED	RESPONDED	ACTION TAKEN

PROTECTIVE CLOTHING

LEVEL OF PROTECTIVE CLOTHING A ____ B____ C____ D____

MATERIAL OF CHEMICAL SUITS USED _____
_____

INJURIES/CASUALTIES

WERE THERE CASUALTIES/INJURIES AT THIS INCIDENT? [ ] YES [ ] NO

NO. OF CIVILIAN FATALITIES _____ NO. OF CIVILIANS INJURED _____

NO. OF FIREFIGHTER FATALITIES _____ NO. OF FIREFIGHTERS INJURED _____

NO. OF CONTAMINATED CIVILIANS _____ NO. OF CONTAMINATED FIREFIGHTERS _____

DESCRIBE AND EVALUATE TREATMENT PROVIDED.

SCENE DESCRIPTION

LOG ESTABLISHED [ ] YES [ ] NO WHEN_____

COMMAND POST SET UP [ ] YES [ ] NO WHERE _____

STAGING AREA DESIGNATED [ ] YES [ ] NO WHERE _____

EXCLUSION AREA DEFINED [ ] YES [ ] NO WHERE _____

EXTENT_____

CONTAMINATION REDUCTION AREA

EXTENT_____

CONTAMINATED CONTROL LINE [ ] YES [ ] NO

EXTENT _____

TRIAGE/TREATMENT AREA [ ] YES [ ] NO

DECONTAMINATION

PROCEDURES USED _____

WHO DIRECTED DECONTAMINATION? _____

EFFICIENCY OF DEPARTMENT

SUGGESTIONS TO IMPROVE EFFICIENCY OF OPERATIONS _____

INCLUDE A DIAGRAM OF THE INCIDENT, INCLUDING THE LOCATIONS OF THE COMMAND POST, THE STAGING AREA, THE ZONES, AND THE WIND DIRECTION.

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AFTER-ACTION REPORT

INCIDENT NUMBER _____INCIDENT DATE _____INCIDENT TIME_____

DEBRIEFING DATE_____TIME_____LOCATION _____

INCIDENT SYNOPSIS _____

ATTACHMENTS

SITE SAFETY PLAN [ ] DEBRIEFING FORM [ ] CRITIQUE [ ]
SPECIFY_____

PROBLEMS IDENTIFIED

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

SPECIFIC ISSUE	RESPONSIBLE PARTY	DATE DUE
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

ACRONYMS

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ACRONYMS

ABC	airway, breathing, circulation
AED	automated external defibrillator
AFFF	aqueous film-forming foam
AHJ	authority having jurisdiction
ALS	advanced life support
APR	air-purifying respirator
ATF	Bureau of Alcohol, Tobacco, Firearms and Explosives
BLS	basic life support
CBRNE	chemical, biological, radiological, nuclear and explosive
CDC	Centers for Disease Control and Prevention
CEO	Chief Executive Officer
CFR	Code of Federal Regulations
CGI	combustible gas indicator
CHEMTREC	Chemical Transportation Emergency Center
CIA	Central Intelligence Agency
CIKR	Critical Infrastructure and Key Resources
CISD	critical incident stress debriefing
CONPLAN	Concept of Operations Plan
CP	Command Post
CPC	chemical protective clothing
CRZ	Contamination Reduction Zone
CST	Civil Support Team
DEA	Drug Enforcement Administration

DECIDE	Detect, Estimate, Choose, Identify, Do and Evaluate
DHS	Department of Homeland Security
DISASTER	Detection, Incident Command, Safety & Security, Assess Hazards, Support, Triage & Treatment, Evacuation and Recovery
DOD	Department of Defense
DOT	Department of Transportation
DUI	driving under the influence
DWI	driving while intoxicated
EKG	electrocardiogram
EMA	emergency management assistance
EMAC	Emergency Management Assistance Compact
EMI	Emergency Management Institute
EMS	Emergency Medical Services
EMT	emergency medical technician
EOC	Emergency Operations Center
EOD	explosive ordinance device
EPA	Environmental Protection Agency
ERG	Emergency Relocation Group
ESF	Emergency Support Function
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FIRESCOPE	**Fi**re **Res**ources of **C**alifornia **O**rganized for **P**otential **E**mergencies
FRERP	Federal Radiological Emergency Response Plan

GEDAPER	**G**ather information, **E**stimate potential course and harm, **D**etermine strategic goals, **A**ssess tactical options and resources, **P**lan and implement actions decided upon, **E**valuate the action plan, **R**eview strategic goals
GIS	Geographic Information System(s)
gpm	gallons per minute
HEPA	high-efficiency particulate arresting
HIV	human immunodeficiency virus
HMIM	"Hazardous Materials Incident Management"
HMRU	Hazardous Materials Response Unit
HMTA	Hazardous Materials Transportation Act
hp	horsepower
HSC	Homeland Security Council
HSOC	Homeland Security Operations Center
HSPD	Homeland Security Presidential Directive
IAFC	International Association of Fire Chiefs
IAP	Incident Action Plan
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
IDLH	immediately dangerous to life and health
IED	improvised explosive device
IIMG	Interagency Incident Management Group
IMS	Incident Management System
IMT	Incident Management Team

INRP	Initial National Response Plan
JFO	Joint Field Office
JTTF	Joint Terrorism Task Force
LEL	lower exposure limit
LEPC	Local Emergency Planning Committee
LODDs	line-of-duty deaths
LPG	liquefied petroleum gas
LRN	Laboratory Response Network
LSC	Logistics Section Chief
MACS	Multiagency Coordinating System
MOPP	Military Oriented Protection Posture
mph	miles per hour
MSDS	Material Safety Data Sheet(s)
NAERG	North American Emergency Response Guidebook
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDPO	National Domestic Preparedness Office
NETC	National Emergency Training Center
NFA	National Fire Academy
NFDC	National Fire Data Center
NFP	National Fire Programs
NFPA	National Fire Protection Association
NIC	NIMS Integration Center
NIH	National Institutes of Health

NIIMS	National Interagency Incident Management System
NIMS	National Incident Management System
NIOSH	National Institute for Occupational Safety and Health
NRP	National Response Plan
NTSB	National Transportation Safety Board
NWCG	National Wildfire Coordination Group
OSC	Operations Section Chief
OSHA	Occupational Safety and Health Administration
PA	public address
PAPR	powered air-purifying respirator
PEL	permissible exposure limit
PFO	Principal Federal Official
PIO	Public Information Officer
PPE	personal protective equipment
ppm	parts per million
PP-SCBA	positive-pressure self-contained breathing apparatus
PPV	positive-pressure ventilation
PSC	Planning Section Chief
RESTAT	Resource Status
RIC	Rapid Intervention Crew
RIP	recognizing, identifying and preserving
RMP	risk management plan
RN	Registered Nurse

RRT	Regional Response Team
SARA	Superfund Amendments and Reauthorization Act
SAW	Student Activity Worksheet
SBC COM	Soldier Biological and Chemical Command
SCBA	self-contained breathing apparatus
SEB	Staphylococcal Enterotoxin B
SERC	State Emergency Response Commission
SITSTAT	Situation Status
SM	Student Manual
SMART	Specific, Measurable, Achievable, Realistic and Timeframed
SOGs	standard operating guidelines
SOPs	standard operating procedures
SSP	site safety plan
SWAT	Special Weapons and Tactics
TDI	toluene diisocyanate
TIC	toxic industrial chemical
TRACEM	thermal, radiation, asphyxiation, chemical, etiological and mechanical
TRACEME	thermal, radiation, asphyxiation, chemical, etiological, mechanical and electrical
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFA	U.S. Fire Administration
USPIS	U.S. Postal Inspection Service
USPS	U.S. Postal Service

VEE	Venezuelan Equine Encephalitis
VOC	volatile organic compounds
WMD	weapons of mass destruction
WMDOU	Weapons of Mass Destruction Operations Unit
WTC	World Trade Center

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